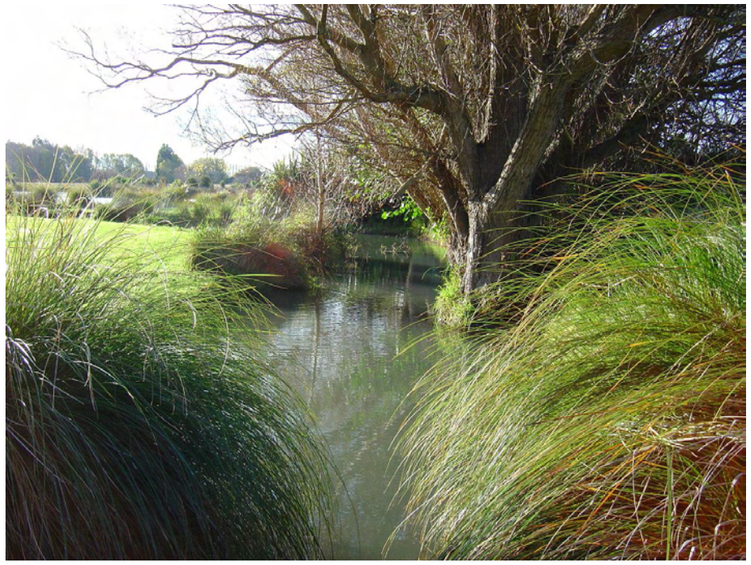
Belfast Area Plan: The Greenprint



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Contents

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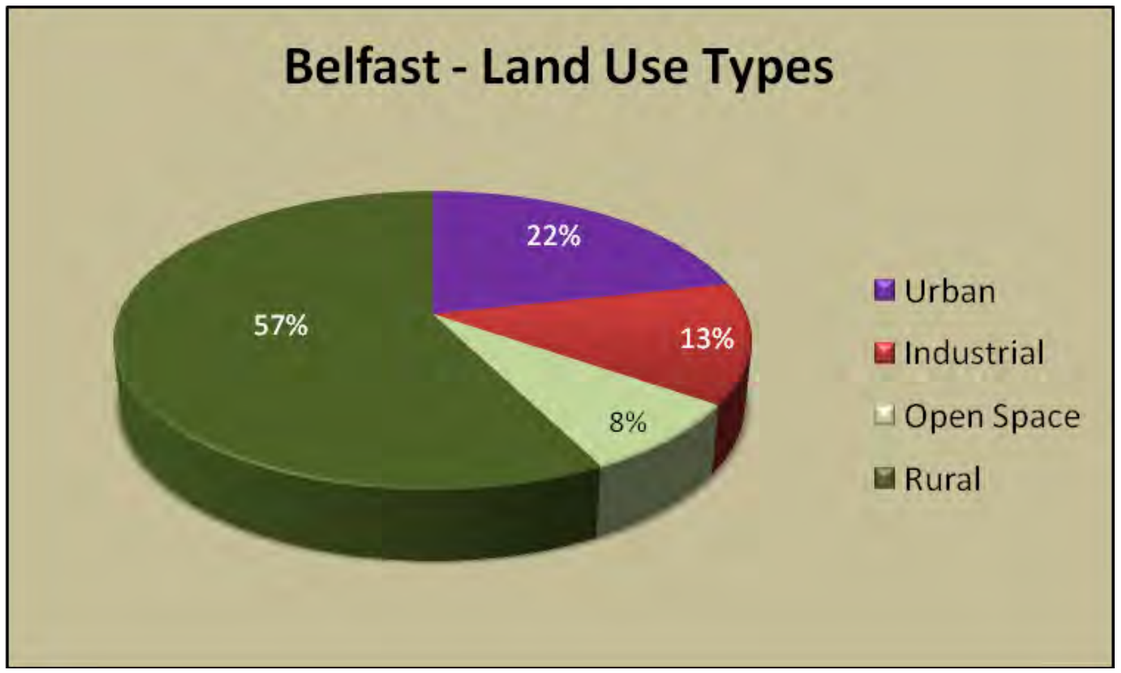
The Council does not guarantee the accuracy of the data or information contained in this Phase 1 Report. Whilst every endeavour has been made to compile data and information that is up to date and relevant, not all of it has been, or is capable of being verified. This report should not be relied upon for the purposes of any proposed property transaction, including subdivision or land use approvals and building consents. The recommendations provided in this report do not guarantee that any or all of the land is suitable for development.

1. Introduction

1.1 Overview of the Belfast area

The Belfast area covers 1,349 hectares of relatively flat land and encompasses urban, rural and industrial land uses. Approximately 284 hectares of the area is zoned residential (urban), 756 hectares rural, 172 hectares industrial, and 103 hectares is zoned open space (refer to Figure 1). The existing land use pattern in Belfast gives the impression of a rural township, and the urban area is surrounded in most directions by pastoral farming, and other agricultural and horticultural activities. Belfast extends north to the Waimakariri River and south to the Styx River and Styx Mill Conservation Reserve. To the west, Belfast is bordered by the Groynes recreation area, and the Kaputone Stream forms a natural boundary in the east. Belfast is one of the oldest residential areas of Christchurch and is currently undergoing significant urbanisation and development.

Figure 1: Belfast Area Land Use Types



Between 1996 and 2006, Belfast's residential population grew from 3,195 to 7,641. This was mainly due to the development of new residential subdivisions in the area, such as Northwood. The rate of population growth has also been increasing in Belfast. Between 1996 and 2001, Belfast's population increased at less than 1 percent per year, but increased significantly to 15 percent per year between 2001 and 2006. The growth in Belfast's residential population is likely to continue increasing as long as new subdivisions continue to be developed in the area because of proposed urban expansion as signalled in the UDS.

Recent urban growth in Belfast has resulted in substantial changes to the character of the area. New subdivisions have introduced a variety of residential densities and increased demands on facilities and services. New shopping centres have also emerged to cater for the increased population. The popularity of Belfast as a residential settlement is increasing the pressure to convert adjoining rural land to residential and industrial uses. Proposed urban growth will put pressure on existing facilities leading to an increased need for additional open spaces, community facilities, public transportation, well-integrated residential developments and infrastructure. Urbanisation of the area will also increase the need to protect Belfast's natural areas, heritage sites and significant landscapes that are under increased threat.

The Greater Christchurch Urban Development Strategy and the Christchurch City Plan have identified Belfast as one of the key areas for accommodating future residential growth through a mixture of green field development, and increasing densities in existing residential areas. Projections for significant urban growth in Belfast provide the impetus for the development and implementation of the Greenprint and the Belfast Area Plan to manage such development, whilst recognising and protecting what is important to the distinctive character and amenity of the area.

There are a number of proposed projects that will have an impact on the development, form and function of Belfast in years to come. Significant proposals include the following:

- Northern arterial – A proposed two-lane arterial road to the east of Belfast from the northern motorway to QEII drive (as is designated in the Christchurch City Plan);
- Western by-pass – A by-pass connecting Johns Road and the northern motorway to the north west of Belfast (the route, timing and priority for establishment is to be determined by 2010);
- Section 293 land – A 93 hectare block in the north-west area of Belfast that has been earmarked for residential development;
- Railway corridor – There is potential for the continuation of a shared walking and cycling corridor that is provided on the western side of the railway line in the Papanui area;
- Styx River corridor – A 40 year 'source to sea' vision has been developed for the Styx River, which will have an influence on development of land around this significant waterway;
- The Belfast Supa Centa – Signalled for commercial redevelopment and expansion through the Area Plan to provide a 'district centre' function for Belfast residents.
- PPCS land – A large section of industrial land in the north east of Belfast, which is currently the site of PPCS meat works, may be subject to rezoning and redevelopment in the future.

1.2 Greenprint aims and outcomes

The Belfast Greenprint defines what is to be protected, maintained and enhanced in the face of urban development. It is part of the second stage in the preparation of the Belfast Area Plan and is written in conjunction with an Integrated Catchment Management Plan (ICMP), the Belfast Blueprint (which identifies significant waterway treatment and stormwater management facilities), and a statement of Key Issues and Constraints. The Greenprint identifies areas that have significant natural, heritage, cultural, landscape, open space, recreation, community, and surface and groundwater values. The Greenprint also outlines actions and mechanisms that will be required to ensure that these key values are protected and enhanced during urban development. The Greenprint has been developed from a series of background technical studies that represent a multi-value analysis of the area. These technical reports should be referred to for a more detailed analysis of the sites requiring protection, maintenance and enhancement, and for the identification of the issues and opportunities associated with urban growth in Belfast.

1.3 Community Consultation

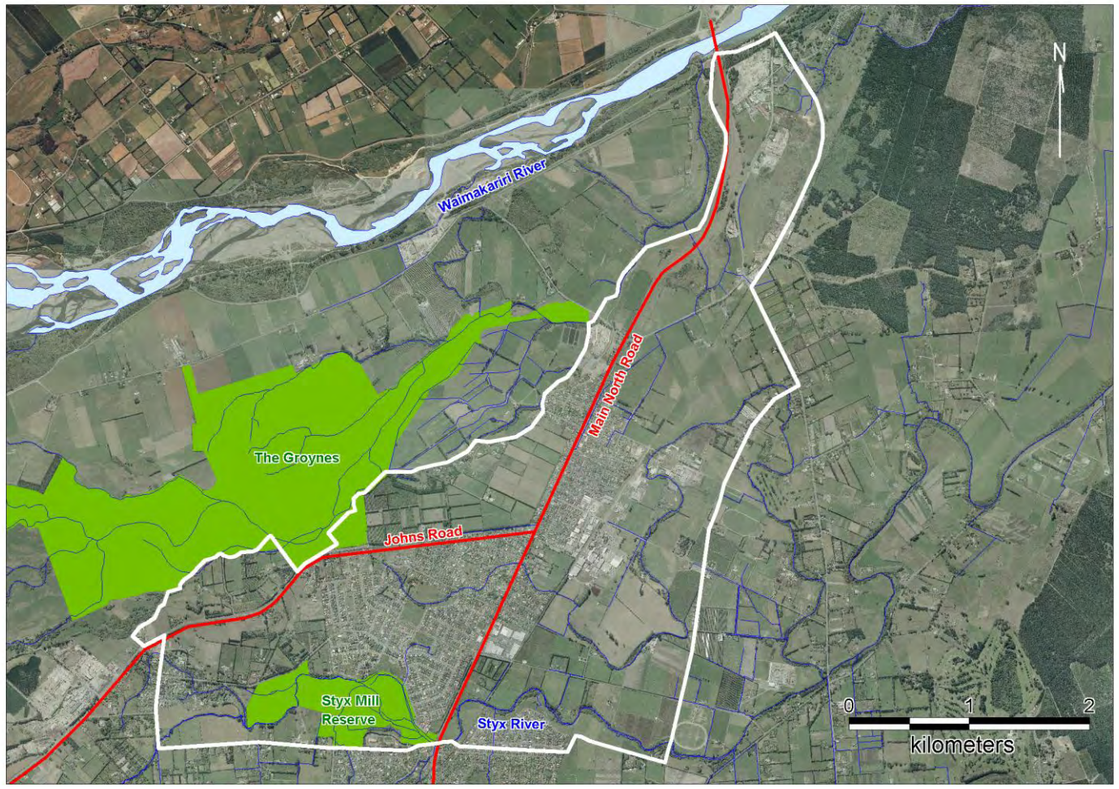
In 2003, the Belfast community was consulted prior to the commencement of work on the Belfast Area Plan. Through the consultation process, the community indicated that they wanted Belfast to be a village community with a strong community heart. They wanted to retain the rural character of Belfast by

protecting the green belt and historical sites. The community also felt the there should be more effort put into developing links between recreational areas with a network of paths, walkways and cycle-ways. Belfast residents specifically identified the following issues as being important:

- Developing an integrated village character for Belfast, as distinct from Christchurch City;
- Developing a community 'heart' for the area centred around Sheldon Park;
- Improving public transport, both within Belfast and into the City;
- Developing the physical environment through enhancing the rural feel of area;
- Co-ordinating improvements to and linking parks and reserves;
- Developing community facilities for children and young people.

These needs and aspirations will be reflected to a significant degree in the Belfast Greenprint and the subsequent Area Plan. They will require strong partnerships between the Council, other agencies, such as the New Zealand Transport Agency (NZTA) and Environment Canterbury (ECan), communities, tangata whenua and land developers.

Figure 2: Aerial overview of Belfast



1.4 How to read the Greenprint

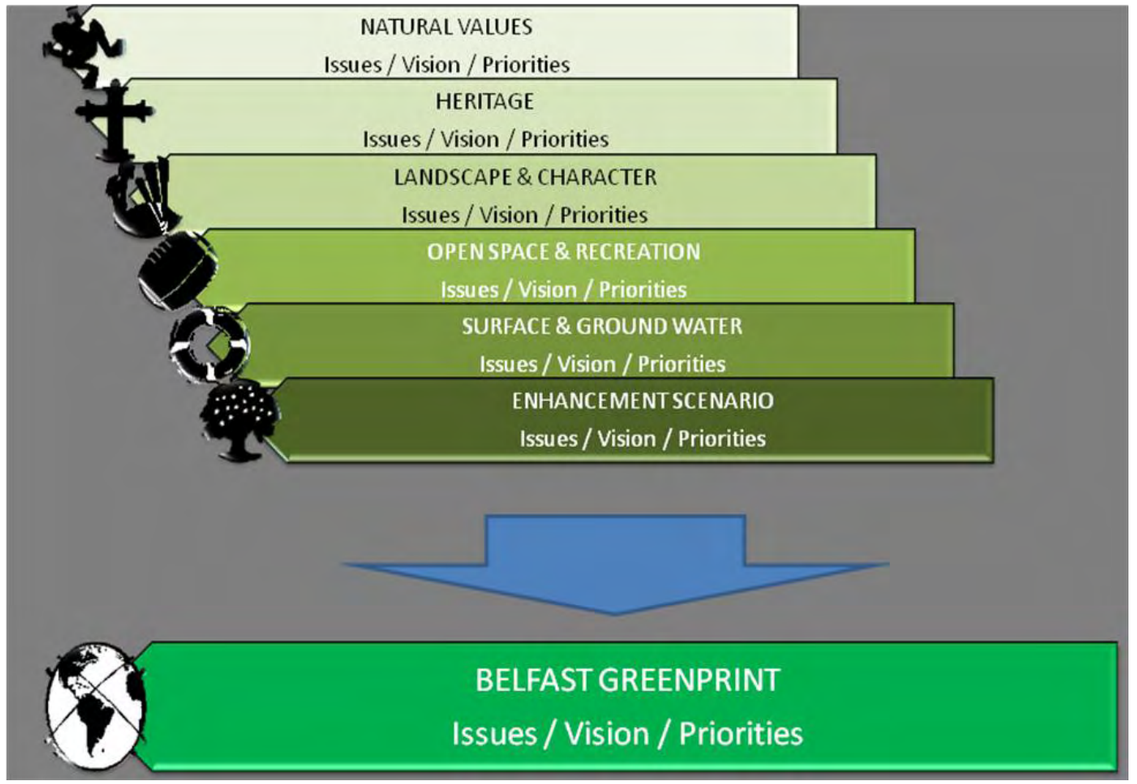
The Belfast Greenprint defines what is to be protected, maintained or enhanced as a consequence of urban development. With regard to a range of important attributes in Belfast, the Greenprint outlines key values and issues, and determines an appropriate vision. It then determines the perceived significance of the sites, outlines the actions and costs of managing and maintaining values in the area and considers whether there are enhancement opportunities. The Greenprint separates important values into the following categories:

1 Natural Values (Section 3);
2 Heritage Values (Section 4);
3 Landscape Character, Amenity and Urban Design (Section 5);
4 Open Space, Recreation and Community Facilities (Section 6);
5 Surface and Ground water Values (Section 7).

Also included in the Greenprint, is an 'Enhancement/Best practice Option' for Belfast (Section 8), which outlines a scenario where the priority for change in the area would be based on enhancing Belfast's natural values and open spaces without being tempered by justification in terms of the Resource Management Act 1991, or City Council capital expenditure budgeting priorities. Work has already begun on achieving elements of this option and is largely justified through other regulatory mechanisms, such as those set out in the LTCCP. This section is informed by work already being undertaken within the Christchurch City Council associated with the 'Styx Vision'.

Finally, the Greenprint collates all of the key values in the Belfast area and determines the overall priorities for implementing a Greenprint network to coincide with development and change for the area.

Figure 3: Sections of the Greenprint



1.5 Overview of Greenprint costings

Costings presented in each section of this document are based on estimated values for land acquisition or functions (either statutory or non-statutory) to provide for recognition and/or implementation as a consequence of the Belfast Area Plan. As these costs feature throughout the Greenprint it is timely to provide and overview of how they have been developed.

Estimated land costs are based on a calculation of the area to be purchased; with land values per square metre based on 2007 City Council Property Unit assessments as follows:

- Rural land surrounding Belfast $15/m^2
- Rural land to the west of Main North Road $17.50/m^2
- Industrial Land adjacent to PPCS $200/m^2
- Industrial Land in the Chaney's Area $80/m^2
- Residential Land $475/m^2

For example: Styx Riparian corridor of a 50m width zoned rural for length of 1.1km (total area of 3.85Ha @ $15/m^2) = $577,500.

Estimated expenditure for other functions and processes has been based on an estimation of the likely scale/timeframe (based on anticipated hours), in conjunction with the likely hourly rate for the experts involved. The following is an example estimated costs associated with the assessment of heritage values.

- Director / Manager: $250/hr
- Chartered Building Surveyor $160/hr
- Heritage Architect / Planner $140/hr

Identification of whether to list a building in the City Plan would likely involve:

- Undertaking research on the site to determine its full significance (12 hours).
- Discussions with current landowners (2 Hours)
- Comprehensive Plan Change to incorporate all heritage buildings identified through the Greenprint
- Issues and options paper providing comparative analysis (80 hours)
- Preparation of Section 32 material supporting amendments to the City Plan to include listing (120 hours)
- Statutory process to amend City Plan (200 hours).

There are a number of policy documents and levels of service which influence council expenditure on land and functions, including the following:

- The Resource Management Act (1991): Requirement for a 20m wide esplanade reserve at the time of subdivision (s230), for the purposes of conservation, recreation or access values (s229), compensation to landowners is required for widths in excess of 20m (s237E).
- Local Government Act (2002): Requirement for Council to establish a Development Contributions Policy and link to its Long Term Council Community Plan (LTCCP).
- Development Contributions Policy: The Council's DCP 2007/09, which is applicable city-wide (includes the Belfast area), currently requires development contributions in respect of the following seven activities:
    - Reserves;
    - Network infrastructure
    - Water supply and conservation;
    - Wastewater collection;
    - Wastewater treatment and disposal;
    - Surface water management;
    - Transport;
    - Community infrastructure;
    - Leisure facilities.

  Applications for resource consent, building consent and service connection are the temporal triggers at which point all residential and non-residential developments are assessed and those that cause the Council to incur capital expenditure (to provide reserves, network and community infrastructure) are required to pay a development contribution.
- The current LTCCP (2006 – 2016) sets standard requirements for the provision of services, functions, reserves and network utilities (for example, transport and stormwater management) and is linked to the Council's development contribution requirements. These standards are then applied at the time of subdivision, building consent or service connection to provide for an equitable provision of services throughout the City. For example, the requirements for the provision of reserves and open spaces (refer to table 1).

Table 1: Christchurch City Council Levels of Service

Measures and Targets	Current performance	06/07	07/08	08/09	2009 - 2016
Area of urban park per 1,000 population	4.7Ha	4.7Ha	4.7Ha	4.7Ha	4.7Ha
Percentage of urban residences within 400m of a park	90%	90%	90%	90%	90%
Area of Regional Park per 1,000 population	13Ha	13.1Ha	13.2Ha	13.3Ha	13.4Ha
Provision of recreational facilities per 1,000 children	>4	>4	>4	>4	>4
Youth facilities per 1,000 youth	>1	>1	>1	>1	>1
Playing fields per 1,000 sports participants	14 Winter 7 Summer	14 Winter 7 Summer	14 Winter 7 Summer	14 Winter 7 Summer	14 Winter 7 Summer

- Public Works Act (1981): Land acquired/purchased by negotiation is required for a public work or function (i.e. stormwater management). Land acquired by compulsion is required to be for a public work or function (i.e. stormwater management). This process is usually commenced by the Council utilising its designation functions as a network utility operator and serving a notice of requirement for designation (s168A of the RMA).
- Christchurch City Plan: There are an array of policies and rules within the City Plan that control development to protect our City's natural and physical resources, e.g. purpose and requirement for conservation and reserve networks, building setbacks from water bodies, building restrictions within ponding areas and land use restrictions within Conservation Zones. The Belfast Area Plan anticipates a series of Plan changes to the City Plan will alter the provisions of the plan and may allow new types of activities or development, or alternatively restrict activities that were formerly allowed.

Costs associated with the Styx Vision section of this report are based on an assessment of land desired to fulfil the community's aspirations within the Styx Corridor. A valuation of the Styx Corridor has been undertaken by Ford Baker Valuation Ltd. (2009) for the Christchurch City Council.

In addition to capital expenditure identified within the Belfast Greenprint, operational costs have also been estimated. The operational expenditure estimates are based on the following assumptions:

- Base year costs (August 2007) have been employed to be consistent with the Capital Expenditure costs evaluation for the area plan, except where noted. The final Implementation Plan will provide a CPI adjusted estimate of all costs.
- The majority of operational cost estimates have been provided from contract rates held on CCC cost databases.

- The costs have been determined based on aggregate costs for particular operational works, and hence it is expected that there will be some variation when applied to specific circumstances and locations.

Information sources for possible operational expenditure items, assumptions and associated costs were sourced from the following:

- Christchurch City Council Staff;
- LTCCP projected budget estimates;
- CCC Contract and budget databases.

NOTE: In order to simplify the presentation of costs during the development phases of the Belfast Area Plan a coding system is used within the Greenprint to denote indicative costs. This has been undertaken to improve readability and to acknowledge the tentative nature of financial projections, which are likely to be subject to market fluctuations. The exception to this coding system is the Styx Vision section (Chapter 9). The costs associated with this section have been independently assessed by Ford Baker Valuation, and are correct as of the 29th of January 2009.

$ Minimal cost or operational expenditure $2,500 to $9,999
$$ Operational expenditure $10,000 to 79,999
$$$ Operational expenditure or small scale capital expenditure $80,000 to $499,999
$$$$ Moderate capital expenditure or localised land purchase $500,000 to $999,999
$$$$$ Strategic land purchase or capital expenditure exceeding $1 million

1.6 Limitations of the Greenprint

Information presented in this document is based on background reports prepared for the Christchurch City Council by qualified professionals who represent experts in their particular fields of endeavour. These documents are based on information available at the time of writing; however, a number of years have elapsed since some of these reports were developed. It is likely, therefore, that a number values described in the background reports may have changed in the interim. For this reason, all of the information contained in this Greenprint, including recommended actions, costs and maps should be regarded as provisional only and subject to change. Furthermore, the final priorities outlined in this document represent a subjective assessment based on the best available information, community consultation and contributions from experts in a range of relevant disciplines. Wide consultation with key stakeholders and the public will be required before these priorities can be accepted as Council policy.

2. Policy Context

2.1 Introduction

This section of the Greenprint, provides an overview of the central government legislation and local policies that influence the City Council's preparation and implementation of the Greenprint within the context of managing urban growth and development in this area. The Greenprint and the Area Plan have been prepared in accordance with the functions of the Christchurch City Council under the Local Government Act (2002) and Resource Management Act (1991). The Greenprint and Area Plan will aid the Council in carrying out its functions under these Acts by undertaking the following:

- Ensuring sustainable management of the area's natural and physical resources;
- Facilitating the integrated planning of Council-managed services;
- Identifying opportunities for land development;
- Providing direction for the Council's acquisition of strategic land areas; and
- Providing a framework for the collection of development contributions.

This chapter is divided into four main sections: central government legislation, local statutory policies, local non-statutory policies and the Styx Vision policy context.

2.2 Central Government Legislation

A number of central government policies affect the decision making of local authorities. Central government policies that influence the development and implementation of the Greenprint and subsequent Belfast Area Plan include the Resource Management Act (1991), the Local Government Act (2002), the Reserves Act (1977), the Conservation Act (1987), the Historic Places Act (1993), Te Rūnanga o Ngāi Tahu Act (1996) and the Ngāi Tahu Claims Act (1998). In the following section, each of these policies is briefly outlined.

2.2.1 The Resource Management Act (1991)

The Resource Management Act promotes the sustainable management of natural and physical resources throughout New Zealand. The Act enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety, while at the same time:

- Sustaining the potential of natural and physical resources in a way, or at a rate, which enables people to meet the reasonably foreseeable needs of future generations; and
- Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and
- Avoiding, remedying or mitigating any adverse effects of activities on the environment.

The Resource Management Act requires all persons exercising functions and powers under the Act, including local authorities, to recognise and provide for the following (Section 6) matters of national importance, which can be linked to the Belfast area:

- The preservation of the natural character of the coastal environment, wetlands, lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use and development. In the Belfast context, this would include, for example, recognition of the importance of the Styx and Kaputone River corridors, the South Branch of the Waimakariri River and Otukaikino (Wilson's) Reserve;
- The protection of outstanding natural features and landscapes from inappropriate subdivision, use and development;
- The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. In relation to Belfast, this would include the identified terrestrial habitats of the Otukaikino Reserve, Styx Mill Reserve, Kaputone (Kā Puātahi) riparian margin, Sheldon Park, and sections of the upper reaches of the Styx River/Puharakekenui and its tributaries;
- The maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers, which for Belfast is supported by the Council Strategy Styx Vision 2000-2040 which sets out to achieve a 'source to sea' Styx esplanade reserve, as well as ensuring that access to waterways within the area is enhanced;
- The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu (sacred places) and taonga (cultural treasures). Ngāi Tahu are the tangata whenua, represented through Te Rūnanga o Ngāi Tahu and Te Ngāi Tūāhuriri Rūnanga. Ngāi Tahu have identified a number of features of Belfast, such as Otukaikino Reserve, as culturally significant, as well as emphasizing the need for greater endeavours to improve the general quality and mauri (life force) of Belfast's environment.
- The protection of heritage places from inappropriate subdivision, use and development. Belfast has a number of significant heritage buildings and structures that are recognised by the Historic Places Trust and the Christchurch City Plan. There are also historically important sites that will require a higher level of protection as Belfast develops, and buildings that are currently unlisted and will need to be assessed prior to listing.
- The protection of recognised customary activity. Ongoing dialogue will be necessary with Te Rūnanga o Ngāi Tahu and Te Ngāi Tūāhuriri Runanga to ensure that traditional activities, such as mahinga kai (food gathering), can occur and that the environment can sustain customary activity in the future.

In addition to specific matters of national importance, the Resource Management Act also requires local authorities to have particular regard to the following (Section 7) matters:

- Kaitiakitanga (the exercise of guardianship by tangata whenua in accordance with tikanga maori);
- The maintenance and enhancement of amenity values;
- The quality of the environment;
- Intrinsic values of ecosystems;
- The efficient use and development of natural and physical resources;
- Finite characteristics of natural and physical resources.

The Greenprint will endeavour to reflect the principles of sustainable management as outlined by the Resource Management Act, and the subsequent implementation of the Belfast Area Plan will attempt to ensure that urban growth does not adversely affect the natural resources and biodiversity of the area.

2.2.2 The Local Government Act (2002)

The purpose of the Local Government Act is to provide for democratic and effective local government that recognises the diversity of New Zealand communities. The Act provides a framework and powers for local authorities to decide which activities they undertake and manner that they undertake them; promotes the accountability of local authorities to their communities; and provides for local authorities to play a broad role in promoting the social, economic, environmental and cultural well-being of their communities, taking a sustainable development approach; to recognise the Crown's responsibility to take appropriate account of the Treaty of Waitangi and to facilitate the participation of Maori in Council decision-making processes.

The Greenprint and the Belfast Area Plan reflect this sustainable development approach through a focus on environmental protection, managed growth and sustainable financial planning. These documents also emphasise a value-based approach to planning which seeks to reinforce the social, economic, environmental and cultural well-being of Belfast residents in line with the priorities of the Local

Government Act. The documents also reflect the commitment to improving processes for participation of tangata whenua and addresses the particular values and interests they hold in the Belfast area.

2.2.3 The Reserves Act (1977)

The Reserves Act has three main functions, which are all relevant to the development and implementation of the Greenprint and Belfast Area Plan:

- To provide for the preservation and management, for the benefit and enjoyment of the public, areas possessing some special feature or values such as recreational use, wildlife, landscape amenity or scenic value;
- To ensure, as far as practicable, the preservation of representative natural ecosystems or landscapes and the survival of indigenous species of flora and fauna, both rare and commonplace;
- To ensure, as far as practicable, the preservation of access for the public to the coastline, islands, lakeshore and riverbanks and to encourage the protection and preservation of the natural character of these areas.

The Act provides for the acquisition of land for reserves and for the classification and management of reserves. The Act is administered by the Department of Conservation and applies to all areas of New Zealand, both rural and urban. A number of Department of Conservation (DOC) Reserves are located within the territorial boundary of the Christchurch City Council, which has responsibilities for the management of such areas. A significant Department of Conservation reserve within Belfast is the Otukaikino (Wilson's) Reserve, which has important cultural, historic and ecological values for the area. The aims and outcomes of the Belfast Greenprint and Area Plan will support the goals of the Reserves Act by advocating for the protection and enhancement of natural resources and open space areas.

2.2.4 The Conservation Act (1987)

The Conservation Act provides for the conservation of natural and historic resources on land. There are a number of categories of conservation land, including conservation parks, wilderness areas, watercourse areas and amenity areas. The Conservation Act was developed to promote the conservation of New Zealand's natural and historic resources. To achieve this, the Act established the Department of Conservation (DOC), bringing together under one department the conservation functions formerly managed by five different government agencies. While the Act makes DOC responsible for all conservation land, in reality, the Department must work closely with local authorities, such as the Christchurch City Council, in the management of protected areas. The Greenprint and the subsequent Belfast Area Plan will provide protection and enhancement measures for conservation land that within the Belfast area.

2.2.5 The Historic Places Act (1993)

The Historic Places Act identifies the purpose of the Historic Places Trust (NZHPT) as being to promote and preserve the historic and cultural heritage of New Zealand. The Act provides both statutory powers and an advocacy role to the Trust. The principal statutory functions of the Trust include the registration of historic places, management of historic properties, advocacy and public education. The Trust also exercises statutory powers to protect archaeological sites. The Trust maintains a register of heritage items. These include historic places, historic areas and wāhi tapu areas. The information is used to inform the public, notify owners and to assist in the protection of these places and areas under the Resource Management Act (RMA).

Most district plans prepared under the RMA contain provisions to protect historic buildings, places, wāhi tapu and archaeological sites. Any activity, however, that disturbs, damages, destroys or alters an archaeological site may require separate approval from the NZHTP under the Historic Places Act (1993). In addition to NZHTP requirements, many sites of particular importance to Ngāi Tahu are recorded by the use of 'silent files'. These identify the general location of wāhi tapu or other sacred sites, without disclosing their precise location. The Belfast Greenprint and the Area Plan aim to identify and protect all places that have heritage significance to both Europeans and Māori, including the identification of Ngāi Tahu silent files.

2.2.6 Te Rūnanga o Ngāi Tahu Act (1996)

The Te Rūnanga O Ngāi Tahu Act 1996 establishes Te Rūnanga O Ngāi Tahu as the tribal representative body of Ngāi Tahu Whānui. Ngāi Tahu is comprised of 18 Papatipu Rūnanga, or original regional assemblies, and representatives of these Papatipu Rūnanga form the governing body of Te Rūnanga O Ngāi Tahu. Te Rūnanga o Ngāi Tahu is charged with management and investment of settlement assets, distribution of benefits to the whānui, and the protection of Ngāi Tahu rights and interests. Te Rūnanga o Ngāi Tahu owns several subsidiary companies through Ngāi Tahu Holdings Corporation, and is supported by a Chief Executive and administrative office (The Office of Te Rūnanga o Ngāi Tahu).

Section 15(2) of the Te Rūnanga o Ngāi Tahu Act states that *"where any enactment requires consultation with any iwi or with any iwi authority, that consultation shall, with respect to matters affecting Ngāi Tahu, be held with Te Rūnanga O Ngāi Tahu"*. Section 15 of this Act also specifies the regard that must be given to Papatipu Rūnanga in matters under consultation with Te Rūnanga o Ngāi Tahu, and Te Rūnanga o Ngāi Tahu have an agreed consultation protocol that provides for consultation to be conducted at a local level as well as with the iwi. Engagement and consultation with Ngāi Tahu has proceeded through the development of this Greenprint document and is intended to continue throughout the development of the Belfast Area Plan.

2.2.7 The Ngāi Tahu Claims Settlement Act (1998)

This Act gives effect to the Deed of Settlement signed by the Crown and Te Rūnanga O Ngāi Tahu on 21 November 1997 to achieve a final settlement of Ngāi Tahu's historical claims against the Crown. The Act acknowledges Ngāi Tahu's special relationship with places around Te Waipounamu through statutory acknowledgments, and with 49 bird species, 54 plant species, 7 fish species, 5 shellfish species, and 6 marine mammal species, through the identification of a Taonga Species list. The Act also includes a number of other aspects that seek to acknowledge Ngāi Tahu's ability to express its traditional relationship with the natural environment and to exercise its kaitiaki (stewardship) responsibilities. This includes the establishment of dual place names, Statutory Acknowledgement Areas (SAAs), Tōpuni, Deeds of Recognition and vesting of lands. There are no statutory acknowledgments within the area of the Belfast Greenprint and subsequent Area Plan, however, there are many places and waters of significance and this Greenprint and the Area Plan to follow, will acknowledge and recognise the rights of Ngāi Tahu and ensure that their special relationship with the natural environment is recognised, provided for and enhanced where possible. As Belfast becomes increasingly urbanised, measures will need to be taken to ensure that Ngāi Tahu values are protected from changing land uses and a growing residential population.

2.3 Local Statutory Policies and Plans

Statutory policies refer to policies that have been developed by local government authorities (and in some cases other organisations) to give effect to their explicit duties and responsibilities as required under various national legislation. Consequently, such policies, and their subsequent implementation mechanisms must be acknowledged and given effect to as a matter of law. Statutory policies that influence the development and implementation of the Greenprint and subsequent Area Plan include the following: the Christchurch City Plan, the Long-Term Council Community Plan (LTCCP), the proposed Natural Resources Regional Plan (PNRRP), the Regional Policy Statement (RPS) and Te Whakatau Kaupapa (the Ngāi Tahu resource management strategy for Canterbury). These policies are briefly outlined below.

2.3.1 The Christchurch City Plan (2005)

The Christchurch City Plan was the first plan to be prepared by the Christchurch City Council under the Resource Management Act (1991). The purpose of the City Plan is to provide an effects-based framework for the sustainable management of natural and physical resources within the city. It identifies Belfast as a growth areas and defines zones for residential or industrial activities, which each have their own set of rules.

The City Plan defines natural values in relation to natural character and landscape, significant indigenous fauna, public access to lakes and rivers, and ecosystems. The protection of the natural values of water bodies and habitats is a matter of prime importance under the Plan. Both the Styx and Kaputone Rivers are identified within the plan as waterways of national importance, and there is policy within the plan for the provision of esplanade reserves to protect the associated natural and recreational values. There is also policy associated with increasing public awareness of important natural features and habitats within the city. In addition to a consideration of natural values, the City Plan also contains provisions for the protection of the city's landscapes, heritage, open spaces and recreational facilities. City Plan policies that are relevant to the Greenprint include the following examples:

- The sustainable use of land and soil resources to meet community needs, and the avoidance of physical degradation of these resources;
- Maintenance and enhancement of the quality and availability of the City's water resources, and of natural values and public accessibility of waterways and their margins;
- The maintenance and enhancement of natural and physical features and characteristics contributing to the distinctive form of the city;
- A pleasant and attractive city;
- The conservation and enhancement of heritage items and values;
- To recognise the importance of, and provide for, the relationships of Māori, their culture and traditions with ancestral lands, waters, sites, wāhi tapu and other taonga;
- Open spaces and recreational facilities that are equitably distributed and conveniently located throughout the city;
- Diversity in the type and size of open spaces and recreational facilities to meet local, district, regional and nationwide needs.
- To accommodate urban growth with an emphasis on consolidation;
- Patterns of land use that promote and reinforce a close proximity and good accessibility between living, business and other employment opportunities;
- Peripheral urban development of a scale and character consistent with a primary emphasis on urban consolidation; which avoids, remedies or mitigates adverse impacts on water, versatile soils, significant amenity values and other natural resources; and which makes efficient use of physical infrastructure.

The Greenprint and the subsequent Belfast Area Plan will endeavour to give effect to policies of the Christchurch City Plan.

2.3.2 Long Term Council Community Plan (2006-2016)

The Local Government Act makes councils responsible for the preparation of a Long Term Council Community Plan (LTCCP). The purpose of the LTCCP is to describe the activities of the local authority; describe the community outcomes of the local authority's district; provide integrated decision making and coordination of the resources of the local authority; provide a basis for accountability of the local authority to the community; and provide an opportunity for the public in the decision-making processes on activities to be undertaken by the local authority. The Long Term Council Community Plan is also responsible for identifying and supporting 'Community Outcomes'. Community outcomes have been identified by local people and describe the kind of society that people in the community desire. Current community outcomes that have been identified by the residents of Christchurch include the following:

- A safe city;
- A city of inclusive and diverse communities;
- A city of people who value and protect the natural environment;
- A well-governed city;
- A prosperous city;
- A healthy city;
- A city for recreation, fun and creativity;
- A city of lifelong learning; and
- An attractive and well-designed city.

Community Outcomes provide direction for planning and capital expenditure relating to the provision of such local features as network utilities, library facilities and open space for Greenfield development areas. The Greenprint and subsequent Belfast Area Plan, as far as possible, will be aligned with the long-term vision, goals and community outcomes that have been identified in the LTCCP.

2.3.4 The Regional Policy Statement (1998)

The Canterbury Regional Policy Statement was prepared by the Regional Council (ECan) to meet the requirements of Section 60 of the Resource Management Act (1991) and to improve environmental quality in Canterbury. The Regional Policy Statement provides an overview of the resource management issues that affect Canterbury. The chapters in the RPS that are most relevant to the Greenprint include chapter 7 (Soils and land use), chapter 8 (landscape, ecology and heritage) Chapter 9 (water) and 16 (natural hazards); and Chapters 5 and 6 (tangata whenua matters). The RPS also provides guidance regarding how urban development should proceed. In particular, the RPS suggests that patterns of development should encourage self-containment and promote sustainable forms of development.

The aims and outcomes of the Greenprint and the subsequent implementation of the Belfast Area Plan will help to give effect to regional objectives and policies in areas of overlapping responsibility. The RPS relates to the Greenprint by outlining policies to reduce the effects of land use and discharges. This includes setting water quality standards, and identifying and protecting significant water bodies. These measures have implications for the Styx and Kaputone catchments concerning the requirements for esplanade reserve and riparian margins to improve water quality, and ensuring that stormwater management does not degrade natural water systems in the Belfast Area.

A proposed change to the RPS (Proposed Change 1, as amended by Variations 1 to 4) was notified in July 2007. It sets out the preferred settlement patterns, activity centres, urban limits, guidelines for the development of Greenfield areas, the provision of open space, the protection of surface and groundwater, and the effective and efficient use of existing and new infrastructure networks. The Greenprint and the Belfast Area Plan helps to give effect to the proposed change.

2.3.5 Proposed Natural Resources Regional Plan (2007)

The proposed PNRRP has been prepared by Environment Canterbury to help it to meet its functions under section 30 of the Resource Management Act (1991), which relates to the roles and responsibilities of the Regional Council. The PNRRP is divided into a number of chapters, which deal with Tangata Whenua, natural resource management, air quality, water quality, water quantity, beds and margins of lakes and rivers, wetlands and soil conservation. Of particular relevance to the Belfast Greenprint, are the sections on water quality and quantity (Chapters 4 and 5 respectively) and Tangata Whenua (Chapter 2). Particular concerns in the Belfast area include the condition and quality of waterways, such as the Styx River, and the protection of groundwater from contamination.

The Greenprint gives effect to the proposed PNRRP objectives and policies by contributing to the development of an Integrated Catchment Management Plan (ICMP) for Belfast and the wider Styx Catchment. ICMP's promote the integrated management of land and water resources throughout the region. Actions proposed in the Greenprint, which address such features as riparian margins, open space provision, wetlands and others, will be supported by the corresponding Blueprint for Belfast. Both documents will provide the necessary forward planning to contribute to the development of an ICMP for the Styx Catchment.

2.3.6 Iwi Management Plans Recognised by the Iwi Authority

At the time of preparation of this Greenprint, there are two current iwi management plans prepared by Ngāi Tahu that cover the Belfast area. Christchurch City Council is aware that Ngāi Tahu will be embarking on the preparation of a contemporary iwi management plan within the next twelve months.

2.3.6.1 Te Whakatau Kaupapa (1990)

Te Whakatau Kaupapa - Resource Management Stategy for the Canterbury Region isan early planning document prepared by Ngāi Tahu to address the management of the environment by agencies, including local government. Section 74 of the RMA states that a territorial authority must take into account any relevant planning document recognised by an iwi authority affected by a District Plan. Te Whakatau Kaupapa is aimed at assisting local planners, resource managers and politicians carrying out their resource management responsibilities. It provides a statement of the Ngāi Tahu viewpoint and values, and policies - related to natural and physical resources, including water quality and quantity, wāhi tapu and mahinga kai - that should be taken into account when preparing plans under the RMA, and is relevant to matters identified within this Greenprint. The Resource Management Strategy assists in the identification of sites and issues of significance to tangata whenua that should be acknowledged within the preparation and implementation of this Greenprint and the Area Plan.

2.3.6.2 Te Rūnanga o Ngāi Tahu Freshwater Policy (1999)

This policy sets out the Ngāi Tahu associations with freshwater resources, the ways Ngāi Tahu wish to participate in freshwater management and the environmental outcomes sought by Ngāi Tahu for freshwater, The Policy Statement is regarded by Ngāi Tahu as a starting point for consultation and discussion to define the specific priorities of Papatipu Rūnanga in their takiwā, and to identify ways these priorities could be met. A policy of particular relevance in the Belfast Area Plan process relates to the preferred catchment management approach, encompassing the Ngāi Tahu framework of Ki Uta Ki Tai (mountains to sea); integrated objectives between agencies; sustaining the mauri of waterways; protecting traditional cultural uses; and, amongst other things, appropriate prioritisation of use of water. This Greenprint and the Belfast Area Plan address the matters set-out in the iwi policy.

2.4 Local non-statutory policies and strategies

Non-statutory policies refer to policies that have been developed by local government authorities or other organisations to respond to and manage local issues. Non-statutory policies that influence the development and implementation of the Greenprint and subsequent Area Plan include the following: the Greater Christchurch Urban Development Strategy (UDS), the Healthy Environment Strategies, the Physical Recreation and Sport Strategy, the Christchurch Cycling Strategy, the Christchurch Pedestrian Strategy, the Metropolitan Sports Facilities Plan and the Aquatic Facilities Plan.

2.4.1 Greater Christchurch Urban Development Strategy (2007)

The Urban Development Strategy (UDS) guides the long-term sustainable development of Greater Christchurch and was developed jointly by the Christchurch City Council, Environment Canterbury, Selwyn District Council, Waimakariri District Council and Transit New Zealand (now the New Zealand Transport Agency). The UDS, and its statutory implementation through the Regional Policy Statement's Change 1, confirms Belfast as a key urban growth area and provides strategic direction on a range of issues relating to urban growth in the area, including biodiversity and ecosystems, water bodies, outstanding landscapes, storm water, cultural heritage, open space and recreation. The UDS assists in directing and managing the development of Greenfield areas, which is a particularly important issue for Belfast as it is surrounded by rural land and large open space areas. The management of urban growth will need to strike a balance between meeting the needs of a growing population and protecting natural landscapes and recreational resources in Belfast. The UDS also identifies restraints to growth within the greater Christchurch area. Around Belfast, constraints to development include the Waimakariri flood hazard zone, the aquifer recharge zone and the airport noise contour. Despite some constraints, the UDS indicates that there are few restrictions to growth to the west and east of Belfast.

The Greenprint and subsequent Belfast Area Plan will be a key mechanism for the implementation of the UDS in this part of Christchurch. The Greenprint provides detailed guidance on the sustainable management for urban growth areas that have been identified in the UDS, such as Belfast. In terms of the UDS targets, the Greenprint and subsequent area plan will provide for the following:

- Provision for a wide range of appropriate open space areas;
- Protection of surface water systems for Maori and the wider community;
- Protection for core habitat areas and the re-establishment of habitat areas;
- Surface water, open space and biodiversity initiatives are integrated and designed to maximise collective benefit;
- Protection natural values and aquatic ecosystems;
- Protecting and managing outstanding natural landscape.

2.4.2 Healthy Environment Strategies

The Christchurch City Council is currently developing healthy environment strategies that are aimed at improving environmental, social and cultural outcomes across the city. None of these strategies is required by statute, but they assist the Council to meet its requirements under such legislation as the Resource Management Act and the Local Government Act. The Healthy Environment Strategies address

biodiversity, surface water, water supply, open space and sustainability. The Greenprint and the Belfast Area Plan will give effect to these strategies.

2.4.2.1 The Biodiversity Strategy (2008)

Biological diversity (biodiversity) includes native plants and animals, where they live, and how they interrelate with their environment. The main aims of the Biodiversity Strategy are as follows:

- Conserve and restore Christchurch's and Banks Peninsula's indigenous biodiversity;
- Raise awareness and understanding of indigenous biodiversity;
- Encourage widespread participation in support of indigenous biodiversity conservation;
- Improve and facilitate research and monitoring of indigenous biodiversity.

Through the Greenprint and the Belfast Area Plan, greater levels of protection will be sought for Belfast's natural values, including its biodiversity.

2.4.2.2 The Surface Water Strategy (under development)

The Surface Water Strategy provides a long-term vision for the management of water networks above ground, including all rivers, lakes, streams, springs and wetlands, in the face of increasing urban expansion and intensification. The Surface Water Strategy takes a multi-value approach to the management of waterways, which considers water quality and quantity, ecology, heritage, tangata whenua, recreation, landscape and community involvement. The Greenprint and the Belfast Area Plan have a range of actions and mechanisms aimed at protecting and enhancing surface waterways in the area.

2.4.2.3 The Water Supply Strategy (under development)

The Water Supply Strategy provides for the long-term management of groundwater and drinking water resources in Christchurch and on Banks Peninsula. As urbanisation increases and more Greenfield sites are developed in Belfast, there will be increased pressure on Belfast's groundwater resources. There is also a heightened risk of groundwater contamination associated with an increase in impervious surfaces. The Greenprint, in conjunction with the Blueprint and the area plan will provide for the protection of Belfast's groundwater resources in the face of urban development.

2.4.2.4 The Open Space Strategy (under development)

Open space includes publicly accessible green space, blue space, civic and street space. The Open Space Strategy provides the long-term direction for the management and provision of publicly accessible spaces. As Belfast has been identified as a key growth area, there is likely to be increased pressure on existing open spaces and increasing demand for the provision of new resources. The Greenprint and the subsequent Belfast Area Plan give effect to this strategy by helping to guide the provision of open spaces within the context of the needs of wider Christchurch.

2.4.2.5 The Sustainability Strategy (2008)

Sustainability refers to a dynamic process of continual improvement that enables all people, now and in the future, to have quality of life, in ways that protect and enhance the Earth's life supporting systems.
The Sustainability Policy seeks to clarify what the City Council means by the term sustainability. This will enable Council policies and strategies to adopt a consistent point of reference for the term, and for the related concepts and principles to be incorporated with more consistency into Council activities and decision-making. The policy aims to embed sustainability within the Council's plans and policies and within community actions by achieving the following goals:

- Increasing efficiency;
- Creating a 'closed-loop society';
- Using renewable energy and aiming for carbon neutrality;
- Reducing negative impacts on people and the Earth's life-supporting systems; and
- Allowing all people, now and in the future, to meet their needs.

The Greenprint and the Belfast Area Plan focuses on the sustainability and liveability of the Belfast area by managing urban growth in response to a range of values that are important to the local community in addition to providing environmental bottom lines that future urban development will need to respect.

2.4.2.6 Physical Recreation and Sport Strategy (2002)

In 2002, a Physical Recreation and Sport Strategy was developed for the city of Christchurch, which aimed to provide a city in which people could participate in, enjoy and excel at physical recreation and sport. Key goals from that strategy that are applicable to the Belfast area include the following:

- A safe physical environment that encourages participation in recreation and sport;
- A wide range of physical recreation and sport activities that are made available to all citizens of Christchurch and beyond;
- A public that is aware of physical recreation and sport activities and motivated to take part; and
- Physical recreation and sport providers that are effective and working together in a co-ordinated manner.

The Greenprint and the Belfast Area Plan will help to guide the provision of recreation and sports facilities to cater for community need as the residential population increases. It should be noted, however, that the development of sports and aquatic facilities has since been directed by more recent policies that are outlined below.

2.4.2.7 Draft Metropolitan Sport Facilities Plan (2008)

The Draft Metropolitan Sport Facilities Plan provides strategic direction for the provision of sporting facilities in Christchurch for the next 20 years. The plan identifies current facilities that need to be expanded or upgraded, and areas where new facilities are required. Although the Belfast community has identified a need for new and expanded sporting facilities, there is currently no planning provision within the Metropolitan facilities plan for this. Thus, the development of new facilities in Belfast is likely to be a long-term, rather than a short- or medium-term goal. As the population of Belfast increases, it may be appropriate to re-evaluate community needs for a multipurpose sports facility in the area.

2.4.2.8 Aquatic Facilities Plan (2006)

The Aquatic facilities plan provides the strategic direction for the upgrade or closure of older swimming facilities and the development of new facilities across the city. A new pool complex at Papanui (the Graham Condon Leisure Centre) is to be developed in 2009 in partnership with Northlands Mall and Papanui High School. The development of the new facility has prompted the closure of the existing Papanui and Edgware community swimming pools. Whilst the Strategy identifies the closure of the Belfast community pool scheduled for the end of the 2008/09 summer season, the Council is working with the community to implement a number of options for retaining the pool operations for as long as the infrastructure can be financially maintained. While new swimming facilities will be available in Papanui, it will be important to ensure that any future closure of the Belfast community pool does not limit access to swimming facilities. This will be particularly important as the population of Belfast increases.

2.4.2.9 Christchurch Cycling Strategy (2004)

The vision of the strategy is to achieve a cycle friendly city. The key objectives and targets of the strategy are as follows:

- To increase cycling in Christchurch;
- To increase the enjoyment of cycling in Christchurch; and
- To improve safety for cyclists in Christchurch.

The Greenprint and the Belfast Area Plan will help to guide the provision of cycle lanes in the area, and will be focussed on enhancing the safety of the entire community, including cyclists.

2.4.2.10 Christchurch Pedestrian Strategy (2001)

The Pedestrian Strategy aims to support pedestrians and encourage walking as a method of travel and for social recreation. The Strategy places a particular emphasis on the integration of pedestrian needs in all projects carried out by the Council. The main aims of the Strategy are as follows:

- The pedestrian environment is friendly, safe and accessible;
- More people walk, more often; and
- All pedestrians are able to move about freely and with confidence.

Within the Greenprint and the Belfast Area Plan, there will be an emphasis on developing pedestrian corridors and improving walkability throughout the area.

2.4.2.11 Waimakariri River Regional Plan (WRRP) (2004)

The purpose of the plan is to promote the sustainable management of rivers, lakes and hydraulically connected groundwater and river and lake beds in the Waimakariri river catchment. The plan applies to the entire Waimakariri river catchment including the areas seaward of Ferry road, which lies within the coastal margin area. It, therefore, also includes the Styx and Otukaikino creek catchments. Additionally, it also covers the groundwater resource beneath the plains, which feed both the Styx River and the Otukaikino Creek. The Plan regulates the following activities:

- The abstraction of water from the Waimakariri River, tributaries and groundwater;
- Use, diversion and damming of water;
- Discharge of contaminants into the Waimakariri River or its tributaries or onto land where the discharge can enter surface waters;
- Disturbance of the beds of rivers;
- Introduction or planting, and the disturbance, removal, damage or destruction of plants or habitats in river beds;
- Deposition of substances in river beds;
- Reclamation of drainage of river beds.

3. Natural Values

3.1 Introduction

In the context of this report, natural values refer to the various aspects of the Belfast ecosystems. An ecosystem comprises the interaction of all living organisms with each other and with the chemical and physical factors of the environment in which they live (Clark, 2003). The key natural values acknowledged within the Belfast Greenprint include the following: geology and soils, water and wetlands, vegetation, invertebrates, fish and birds. This section is informed by background reports prepared for the Christchurch City Council by Keller, Hardy and Partridge (2008); Boffa Miskel (2007), Partridge (2007) and Crossland (1999). The background reports should be consulted for a more in-depth analysis of the natural values in Belfast and are referenced in full at the end of this document.

3.2 Key natural values

3.2.1 Geology, soils and landforms

Belfast is low lying and interlaced with a network of old river channels. The Styx River, the South Branch of the Waimakariri River (also known as the Otukaikino River), Smacks Creek and Kaputone Stream flow through the area, and there are significant river terraces associated with these waterways. Alluvial gravels, formed by river channels flowing across the Waimakariri river fan, underlie the soil and form the permeable surface strata below Christchurch. These gravel units, together with finely grained silts and clays, form and protect a number of important aquifers. Much of the Belfast area is characterised by Waimakariri deep silt loams, which are relatively well draining and suitable for development. The geology and soils that are present in Belfast support a variety of native and exotic vegetation, which in turn provides habitats for many forms of wildlife. They also afford the opportunity to restore or enhance native plant habitats within Belfast. In addition to the geology and soils, the flat river terraces that characterise Belfast's landform also provide habitable conditions for a variety of native plant and animal species.

3.2.2 Waterways and wetlands

The water resources of Belfast include surface and ground waters; natural, modified and artificial water courses; springs; wetlands and ponding areas. The major waterways in Belfast include the Styx River, Kaputone Stream, Smacks Creek, the South Branch of the Waimakariri River and the associated wetlands. All of these waterways are spring fed. As Belfast has developed, water resources have been significantly modified and a number of wetlands and ponding areas have been drained for urban and rural land uses. Surface water quantity and quality has been reduced because of increased development, and groundwater resources have been tapped for a variety of land uses and activities. A waterway assessment undertaken by Boffa Miskel (2007) identified that water quality in the Styx and Kaputone rivers is less than optimal, although there are some good ecological areas in the upper reaches of the Styx River. The surface waterways in Belfast are hydraulically linked to the groundwater resource, and any change in ground water conditions, such as increasing impermeable surfaces or penetrating through the permeable layer is likely to affect surface water flows. The waterways, riparian edges and associated vegetation are important sites for wildlife and plant life in the Belfast area and should be set aside from development, where appropriate, to ensure that these values are maintained as Belfast becomes increasingly urbanised.

3.2.3 Vegetation

Existing vegetation in Belfast is largely modified, and indigenous vegetation has been replaced by pasture and private gardens. There are, however, a few isolated pockets of significant indigenous vegetation, which should be protected through the implementation of the Belfast Area Plan. The riparian margins of the rivers and streams have retained some native vegetation in a few areas, but the majority of indigenous flora within Belfast is the result of enhancement and restoration projects. Extensive forest ecosystems and dryland savannah once dominated the Canterbury Plains, but these were destroyed during Māori land clearance and early European activities. Historically, indigenous riparian and wetland swamp vegetation lined the waterways and aquatic species flourished in the areas of open water. Much of the indigenous aquatic vegetation has disappeared from Belfast waterways because of habitat disturbances associated with urban development and river realignment. Much of the open farmland that also characterises Belfast provides an important habitat for birds, and there will be a threat to the local avian population if such areas are lost to urban development.

3.2.4 Aquatic invertebrates

A diverse range of invertebrates has been identified in the rivers and streams in Belfast. Fifty aquatic taxa have been identified within the Styx River Catchment, with the most prominent being snails, worms, flies and hoppers. In general, mayfly and stonefly taxa decline in urban streams, which are dominated by pollution tolerant groups. Within the Styx River Catchment, many sites have been identified as having degraded or poor macro invertebrate values, although values are generally higher towards the open riparian margins of the headwaters. Invertebrates are a vital element of ecosystems as they provide a food source for fish, birds and terrestrial invertebrates; assist in the breakdown of natural wastes; remove particles from the water column; reduce the size of organic matter and act as habitat modifiers.

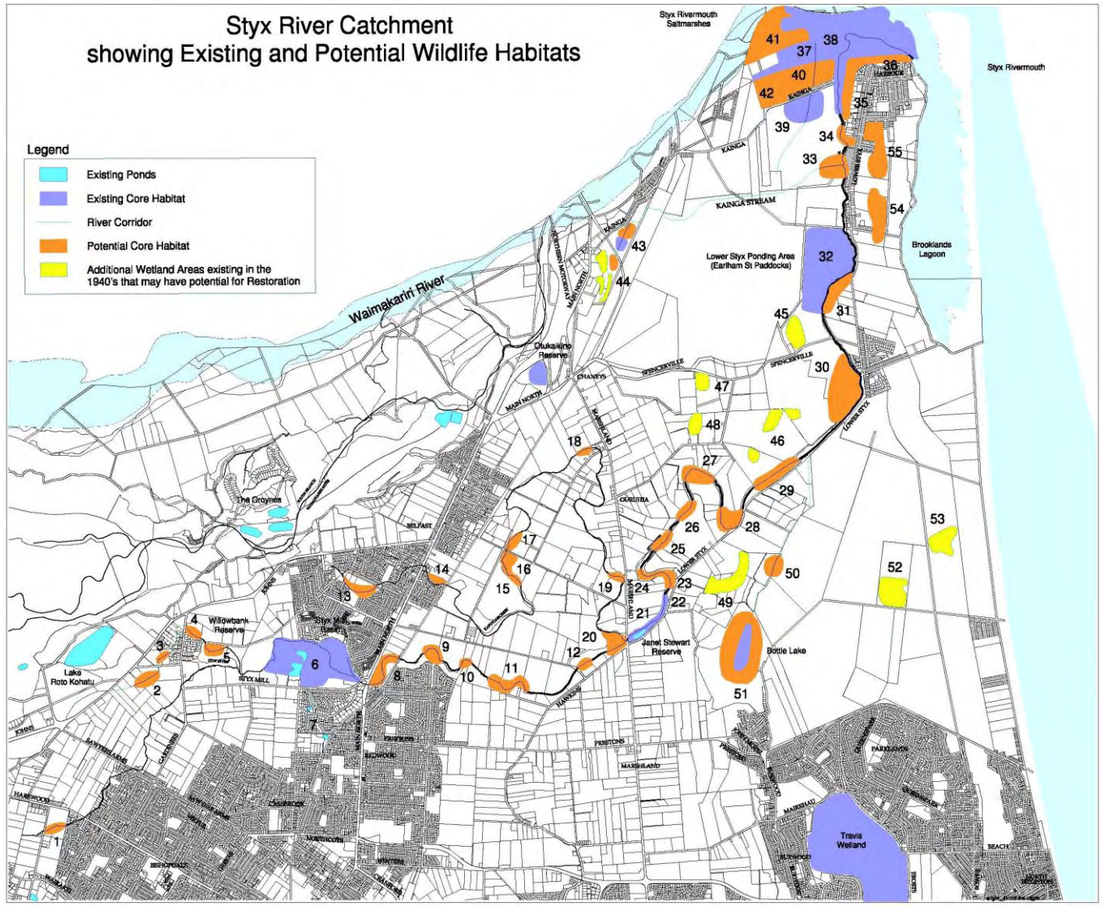
3.2.5 Fish

There are 10 known fish species within the Styx River Catchment. In order of abundance, they include Shortfin Eel, Longfin Eel, Brown Trout, Common Bully, Lamprey, Common Smelt, Inanga, Giant Bully and Black Flounder. None of these species are endangered, although Inanga and Shortfin Eels are vulnerable to over fishing. The Brown Trout population is considered a locally significant fishery, which provides angling opportunities. Within the Styx Mill Catchment, there has been a noticeable decline in trout numbers over recent years because of water pollution, increasing sedimentation and a loss of riparian vegetation. The modified, rural streams that exist in Belfast generally contain fewer and a less diverse range of fish in comparison with unmodified streams. Species diversity is generally higher towards the open riparian margins of the headwaters, which is a reflection of the better quality of water within these reaches of the catchment. This reinforces the importance of catchment protection of aquatic habitat, particularly in the upper reaches of the Styx River. Such a strategy would promote rehabilitation of downstream reaches, subject to appropriate riparian margin provision and restoration.

3.2.6 Birdlife

Prior to European and Māori settlement, Belfast supported abundant birdlife, including both wetland and bush birds, many of which are now extinct. Priority species that currently exist within Belfast include Scaup, Cormorants, Shoveler, Grey Duck, Paradise Shelduck, Grey Teal, Heron, Pied Stilts, Kingfisher, Silver Eye, Grey Warbler, Fantail, Bellbird, Kereru and Shining Cuckoo. Due to the mobility of birds and their range of habitat requirements, birdlife within Belfast needs to be considered in terms of the entire Styx Catchment. The Styx Catchment is ecologically very significant as it lies beneath the Avon-Heathcote Estuary to Waimakariri River Flyway. Birds flying between these two areas will use available habitats located within Belfast, including ponds, rivers, streams and drains, freshwater wetlands, horticultural, agricultural and recreational grasslands.

Figure 4: Wildlife habitat areas in Belfast and the Styx Catchment (as of 1999)



(Crossland, 1999)

3.3 Key issues

- Development and changing land use pose a threat to natural values in the Belfast area;
- Conservation areas, wetlands, waterways, riparian margins and rural land are important habitats for native species, which will require significant levels of protection as Belfast develops;
- Key natural values should be restored, where possible, in areas where they have been lost;
- Exotic weed and pest species pose a threat to native flora and fauna, and these will need to be identified in areas significant natural values have been identified;
- As Belfast develops, it will be necessary to consolidate and develop core habitat areas and mitigate habitat fragmentation to protect existing species;
- Land use activities and urban development pose a threat to local springs and water quality, which will need to be mitigated to ensure that growth in the area does not have a negative impact on surface water;
- There appears to be a lack of community awareness regarding the diversity of natural values, placing these at risk from land development;
- There is a need to improve and facilitate research and monitoring of natural values in the Belfast area to assess the effects of changing land use and development.

3.4 Natural values vision

To Maintain and enhance the quality and quantity of Belfast's natural values and local ecosystems through the protection, enhancement and restoration of geology and soils, water and wetlands, flora and fauna.

3.5 Areas of ecological significance

Areas in Belfast that are particularly sensitive to urban development include local waterways, riparian margins, wetlands, intermittent ponding areas and reserve land. Ecologically significant areas are also part of a wider catchment and open space network, which provides an important connecting function to other areas in Christchurch. The table below describes significant ecological areas (both existing and proposed), highlights the current level of protection for these areas and outlines a number of actions, mechanisms and costs associated with the protection and enhancement of natural values in Belfast.

Map Number	Site name/location	Description	Assessed value[1] 1 – High 5 – Low	Current protection	Issues	Recommended actions	Preferred mechanism(s)	Responsibility	Approximate Costs[2]
1	Styx River	The Styx River is the major waterway that flows through Belfast and is an important natural feature and habitat for indigenous wildlife and plants.	1	Some protection under the City Plan A number of esplanade reserves are already under council ownership Protection of water quality and quantity by ECan under the pNRRP	Land use change and urban development pose a threat to water quality.	Create an esplanade reserve with a minimum width of 20 metres along the Styx River.	Zoning Esplanade reserve Reserve contribution, Land purchase, Stopping unformed legal road (Marshland Rd to Sea)	CCC	$$$$$
					Traditional weed harvesting practices pose a threat to waterway ecology.	Investigate and pilot alternative methods of controlling weed growth for drainage purposes.	Council works and services	CCC	Variable
					The prevalence of weed growth in some waterways poses a threat to waterway quality.	Maintain the frequency of weed harvest.	Council works and services	CCC	Ongoing
					Riparian zones provide habitat and can function to protect water quality. These areas will need to be protected as Belfast develops.	Increase planting of indigenous vegetation along riparian margins.	Council works and services Development contributions Environmental mitigation	CCC Developers Community	Variable
					As Belfast's population increases, there is likely to be increased use of waterways by the local population for diverse purposes.	Increase monitoring of waterway use.	Environmental monitoring	CCC	Variable
					Development and changing land use pose a threat to waterway quality and quantity.	Monitor water quality and flow.	Environmental monitoring	CCC ECan	Ongoing
					Development and changing land use, particularly close to rivers and streams, has the potential to disrupt aquatic ecology.	Monitor aquatic ecology.	Environmental monitoring	CCC ECan	Ongoing
					Development and changing land use may lead to increased pressures to modify certain waterways to improve drainage and reduce flood risk.	Undertake no additional waterway modification, where possible, and where modification has occurred employ methods to mitigate the negative impacts.	Reliance on waterway setback and excavation provisions.	CCC	N/A
					Urban development and changing land use close to waterways may lead to increased sediment inflows.	Implement sediment monitoring and removal mechanisms and restrict sediment discharges.	Environmental monitoring Natural Resource Regional Plan Rules Conditions on developments and subdivision Council works and services	CCC ECan	Variable
					Increasing development and intensification in Belfast will likely lead to an increase in impervious surfaces and increased stormwater runoff.	Encourage on site retention and treatment of stormwater on business premises and new developments.	Integrated stormwater management through ICMP	CCC	N/A
					Increased residential development in Belfast may lead to increases in polluting behaviour.	Reduce the discharge of industrial and household waste to waterways, and regulate to dissuade and/or punish polluting behaviour.	Natural Resources Regional Plan Rules Enforcement and abatement Environmental Monitoring Public education	CCC ECan Local business Community Developers	N/A

[1] The value ascribed to listed waterways is based on the 'perceived importance'. For all other areas in the natural values section, the value presented is based on a systematic assessment that repeats a previous methodology in Belfast.
[2] Where approximate costs are known or able to be calculated.

					Increasing development and intensification in Belfast will likely lead to an increase in impervious surfaces and increased stormwater runoff.	Restrict development of impervious surfaces close to surface waterways.	Waterway setback and excavation provisions Bonds	CCC Local business Developers New Zealand Transport Agency	N/A
					There appears to be a lack of community awareness of natural values associated with waterways.	Increase community awareness of the ecological value of waterways.	Public education	CCC Community	$
2	Smacks Creek	Smacks creek is a spring fed tributary of the Styx River, which has relatively high water quality and supports a diversity of aquatic life.	3	Some protection under the City Plan Narrow esplanade reserves are already under council ownership, but require an increase in width. Protection of water quality and quantity by ECan under the PNRRP	Land use change and urban development pose a threat to water quality.	Create an esplanade reserve with a minimum width of 20 metres along Smacks Creek.	Esplanade reserve	CCC	$$$
					Traditional weed harvesting practices pose a threat to waterway ecology.	Investigate and pilot alternative methods of controlling weed growth for drainage purposes.	Council works and services	CCC	Variable
					The prevalence of weed growth in some waterways poses a threat to waterway quality.	Maintain the frequency of weed harvest.	Council works and services	CCC	Ongoing
					Riparian zones provide habitat and can function to protect water quality. These areas will need to be protected as Belfast develops.	Increase planting of indigenous vegetation along riparian margins.	Council works and services Development contributions	CCC Developers Community	Variable
					As Belfast's population increases, there is likely to be increased use of waterways by the local population for diverse purposes.	Increase monitoring of waterway use.	Environmental monitoring	CCC	Variable
					Development and changing land use pose a threat to waterway quality and quantity.	Monitor water quality and flow.	Environmental monitoring	CCC ECan	Ongoing
					Development and changing land use, particularly close to rivers and streams, has the potential to disrupt aquatic ecology.	Monitor aquatic ecology.	Environmental monitoring	CCC ECan	Ongoing
					Development and changing land use may lead to increased pressures to modify certain waterways to improve drainage and reduce flood risk.	Undertake no additional waterway modification, where possible, and where modification has occurred employ methods to mitigate the negative impacts.	Reliance on waterway setback and excavation provisions	CCC	N/A
					Urban development and changing land use close to waterways may lead to increased sediment inflows.	Implement sediment monitoring and removal mechanisms and restrict sediment discharges.	Natural Resources Regional Plan Rules Conditions on development and subdivision Council works and services Environmental monitoring	CCC	Variable
					Increasing development and intensification in Belfast will likely lead to an increase in impervious surfaces and increased stormwater runoff.	Encourage on site retention and treatment of stormwater on business premises and new developments.	Integrated stormwater management through ICMP	CCC	N/A
					Increased residential development in Belfast may lead to increases in polluting behaviour.	Reduce the discharge of industrial and household waste to waterways, and regulate to dissuade and/or punish polluting behaviour.	Natural Resources Regional Plan Enforcement and abatement Public education	CCC Local business Developers Community	N/A
					Increasing development and intensification in Belfast will likely lead to an increase in impervious surfaces and increased stormwater runoff.	Restrict development of impervious surfaces close to surface waterways.	Conditions associated with the plan change Waterway setback and excavation provisions Bonds	CCC Local business Developers	N/A
					There appears to be a lack of community awareness of natural values associated with waterways.	Increase community awareness of the natural values of Smacks Creek.	Public education	CCC Community ECan	N/A
3	Kaputone Stream	Kaputone Stream is also major tributary of the Styx River. It flows through residential, rural	1	Some protection under the City Plan	Land use change and urban development pose a threat to water quality.	Create an esplanade reserve with a minimum width of 20 metres along Kaputone Stream.	Esplanade reserve/strip Reserve contributions Land purchase	CCC	$$$$$
					Traditional weed harvesting practices pose a	Investigate and pilot alternative methods of controlling weed	Council works and	CCC	Variable

		and industrial land throughout Belfast and provides an important natural feature in this part of the city.		A number of esplanade reserves associated with Kaputone Stream are already under council ownership Protection of water quality and quantity by ECan under the pNRRP.	threat to waterway ecology.	growth for drainage purposes.	services		
					The prevalence of weed growth in some waterways poses a threat to waterway quality.	Maintain the frequency of weed harvest.	Council works and services	CCC	Ongoing
					Riparian zones provide habitat and can function to protect water quality. These areas will need to be protected as Belfast develops.	Increase planting of indigenous vegetation along riparian margins.	Council works and services	CCC Developers	Variable
					As Belfast's population increases, there is likely to be increased use of waterways by the local population for diverse purposes.	Increase monitoring of waterway use.	Environmental monitoring	CCC	Variable
					Development and changing land use pose a threat to waterway quality and quantity.	Monitor water quality and flow.	Environmental monitoring	CCC ECan	Ongoing
					Development and changing land use, particularly close to rivers and streams, has the potential to disrupt aquatic ecology.	Monitor aquatic ecology.	Environmental monitoring	CCC ECan	Ongoing
					Development and changing land use may lead to increased pressures to modify certain waterways for the purposes of improving drainage and reducing flood risk.	Undertake no additional waterway modification, where possible, and where modification has occurred employ methods to mitigate the negative impacts.	Reliance on waterway setback and excavation provisions	CCC	N/A
					Urban development and changing land use close to waterways may lead to increased sediment inflows.	Implement sediment monitoring and removal mechanisms and restrict sediment discharges.	Natural Resources Regional Plan Rules Conditions on developments and subdivision Council works and services Environmental monitoring	CCC	Variable
					Increasing development and intensification in Belfast will likely lead to an increase in impervious surfaces and increased stormwater runoff.	Encourage on site retention and treatment of stormwater on business premises and new developments.	Integrated stormwater management through ICMP	CCC	N/A
					Increased residential development in Belfast may lead to increases in polluting behaviour.	Reduce the discharge of industrial and household waste to waterways, and regulate to dissuade and/or punish polluting behaviour.	Natural Resources Regional Plan Enforcement and abatement Education	CCC Local business Developers Community	N/A
					Increasing development and intensification in Belfast will likely lead to an increase in impervious surfaces and increased stormwater runoff.	Restrict development of impervious surfaces close to surface waterways.	Waterway setback and excavation provisions Bonds	CCC Local business Developers	N/A
					There appears to be a lack of community awareness of natural values associated with waterways.	Increase community awareness of the ecological value of waterways.	Public education	CCC Community ECan	**$**
4	The South Branch of the Waimakariri River	A significant waterway that flows through the northern part of Belfast.	4	Some protection under the City Plan Considerable area adjacent to the margins already under public ownership in excess of 20m Protection of water quality and quantity by ECan	Land use change and urban development pose a threat to water quality.	Create an esplanade reserve with a minimum width of 20 metres along the south branch of the Waimakariri River.	Esplanade reserve	CCC	N/A
					The prevalence of weed growth in some waterways poses a threat to waterway quality.	Increase the frequency of weed harvesting.	Council works and services	CCC	**$$**
					Riparian zones provide habitat and can function to protect water quality. These areas will need to be protected as Belfast develops.	Increase planting of indigenous vegetation along riparian margins.	Council works and services	CCC	Variable
					As Belfast's population increases, there is likely to be increased use of waterways by the local population for diverse purposes.	Increase monitoring of waterway use.	Environmental monitoring	CCC	Variable
					Development and changing land use pose a threat to waterway quality and quantity.	Monitor water quality and flow.	Environmental monitoring	CCC ECan	Ongoing
					Development and changing land use, particularly close to rivers and streams, has the potential to disrupt aquatic ecology.	Monitor aquatic ecology.	Environmental monitoring	CCC ECan	Ongoing
					Development and changing land use may lead to increased pressures to modify certain waterways for the purposes of improving drainage and reducing flood risk.	Undertake no additional waterway modification, where possible, and where modification has occurred employ methods to mitigate the negative impacts.	Subject to Environment Canterbury Flood protection works	CCC	N/A

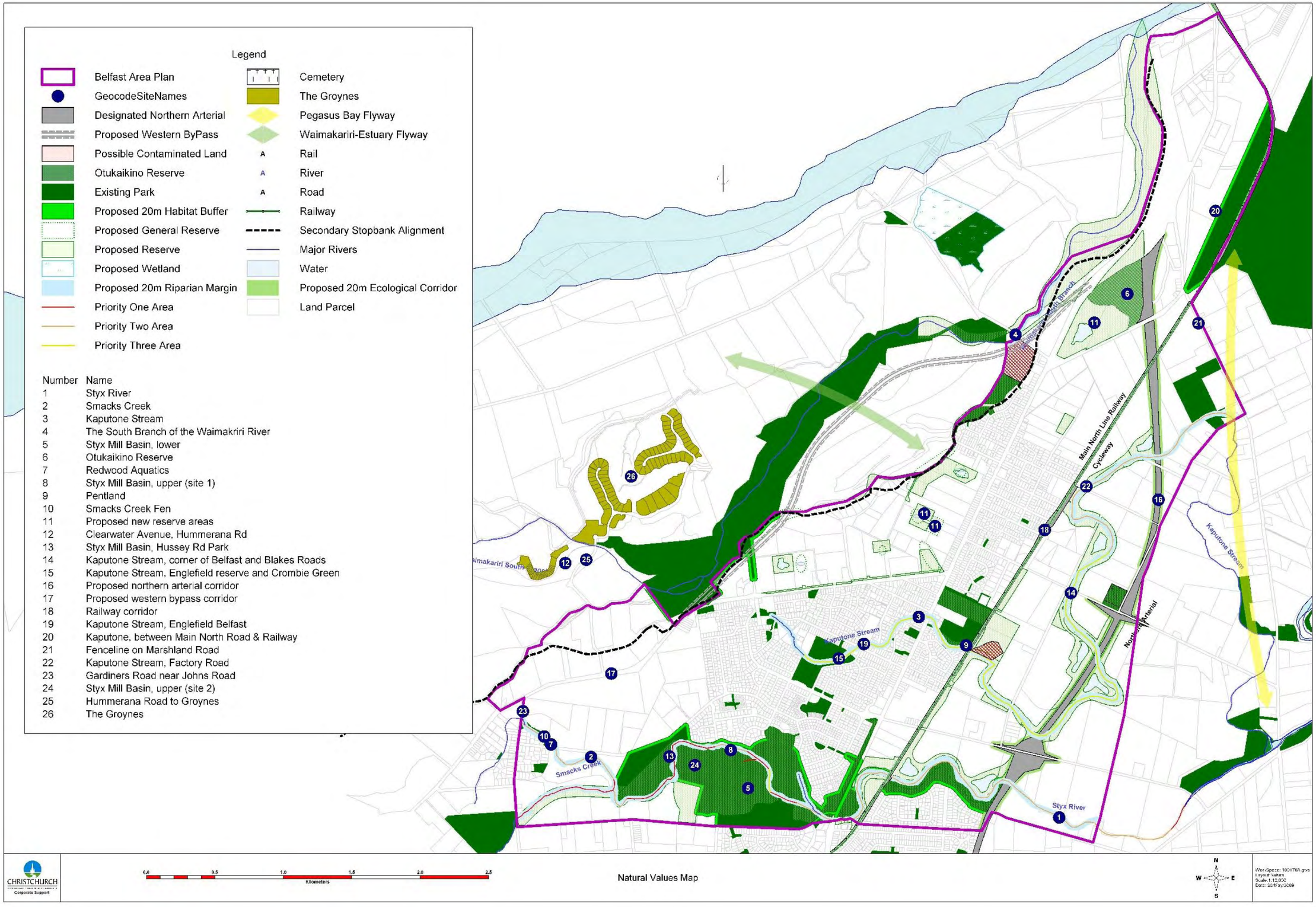
				under the PNRRP	Urban development and changing land use close to waterways may lead to increased sediment inflows.	Implement sediment monitoring and removal mechanisms and restrict sediment discharges.	Environmental monitoring	CCC	N/A
					Increasing development and intensification in Belfast will likely lead to an increase in impervious surfaces and increased stormwater runoff.	Encourage on site retention of and treatment of stormwater on business premises and new developments.	Integrated stormwater management through ICMP	CCC	N/A
					Increased residential development in Belfast may lead to increases in polluting behaviour.	Reduce the discharge of industrial and household waste to waterways, and regulate to dissuade and/or punish polluting behaviour.	Natural Resources Regional Plan Bonds	CCC Local business Developers Community	N/A
					Increasing development and intensification in Belfast will likely lead to an increase in impervious surfaces and increased stormwater runoff.	Restrict development of impervious surfaces close to surface waterways.	Reliance on waterway setback and excavation provisions Bonds	CCC Local business Developers	N/A
					There appears to be a lack of community awareness of natural values associated with waterways.	Increase community awareness of the ecological value of waterways.	Public education	CCC Community	**$**
5	Styx Mill Basin, lower (Styx Mill Conservation Reserve)	The lower reaches of Styx Mill Basin contains large conservation reserve comprising 57 hectares of riparian and wetland habitat. The site has a wide variety of native plants, including many rare species and the largest fen in Christchurch.	1	Listed in the City Plan as an ecological heritage site Protection as a regional park	There is significant projected population growth for the Belfast area, which is likely to increase the level of development.	Mitigate the negative environmental impacts of encroaching urban development.	Zoning Stormwater design Predator proof fence Planted buffer zone	CCC Developers	N/A
					There are currently a variety of pest species in and around conservation areas in Belfast, which pose a threat to native flora and fauna. Significant local pest species include Sycamore, Ivy, Potato vine and others.	Eliminate weed and pest species.	Council works and services	CCC	Ongoing
					In Belfast, as in other parts of Christchurch, there is a lack of indigenous vegetation due to historical land clearance.	Increase the planting of native vegetation in the reserve.	Council works and services	CCC	Variable
					There is a lack of protection for core habitats in Belfast.	Create a 20m habitat buffer around the reserve.	Land acquisition Covenant Easement	CCC	**$$$**
					It is unclear how development of the surrounding area will impact upon ecological values within the reserve.	Monitor ecological values within the reserve.	Environmental monitoring	CCC	N/A
					There is a lack of community awareness and appreciation for the significance of natural values in Belfast.	Increase community awareness of the significance of the reserve.	Public education	CCC Community	**$$**
6	Otukaikino Reserve	A 13-hectare Department of Conservation reserve, which is subject to replanting and restoration of the hydrological system. This area is also a traditional burial preparation site for tangata whenua. This area may provide the best opportunity for restoration activities.	4	Protected under agreement between DOC and Ngāi Tahu	Otukaikino reserve is becoming increasingly well-regarded for its natural values.	Protect and restore the native plants and hydrological systems.	Liaison and assistance where requested with the Department of Conservation	CCC DoC	N/A
					Many of the natural values in the Belfast area are threatened by the presence of weed and pest species.	Eliminate weed and pest species.	Liaison and assistance where requested with the Department of Conservation	CCC DoC	N/A
					It is unclear how development of the surrounding area will impact upon ecological values within the reserve.	Monitor ecological values within the reserve.	Liaison and assistance where requested with the Department of Conservation	CCC DoC	N/A
					Increasing population and development pressures may threaten native plant and animal species.	Extend the reserve, where possible.	Land acquisition	CCC DOC	**$$$$$**
7	51 Hussey Road (Redwood Aquatics)	A privately owned area approximately 1.5 hectares in size containing a large number of replanted natives.	3	No protection (Private land)	Existing native plants are threatened by population increases and development.	Protect existing native plants.	Land acquisition	CCC	**$$$**
					The area is currently being replanted, but there are no guarantees that this project will continue.	Support ongoing replanting efforts.	Council works and services	CCC Local business	Variable
8	Styx Mill Basin, upper	Part of the parkland area at Styx Mill	5	Protection as a regional	Much of the original vegetation of the site has been lost.	Restore the original rush sedgeland.	Council works and services	CCC	Variable

		characterised by riparian rush sedgeland.		park	There is a lack of riparian vegetation along many stretches of waterways within Belfast.	Replant riparian margins.	Council works and services	CCC	
					There are currently a variety of pest species in and around conservation areas in Belfast, which pose a threat to native flora and fauna. Significant local pest species include Sycamore, Ivy, Potato vine and others.	Reduce the presence of exotic species.	Council works and services	CCC	Variable
9	Pentland	A mixed wetland and forest remnant approximately 2,100m^2 in the southeast corner of Sheldon Park, which has been extensively replanted with native vegetation.	4	No protection	Much of the original vegetation of the site has been lost.	Replant native vegetation.	Council works and services	CCC	Variable
					There are currently a variety of pest species in and around conservation areas in Belfast, which pose a threat to native flora and fauna. Significant local pest species include Sycamore, Ivy, Potato vine and others.	Clear weeds and exotic species.	Council works and services	CCC	Variable
10	Smacks Creek Fen	A small fen site adjacent to Smacks Creek, which contains a number of rare native plants.	5	Protected as an esplanade reserve	Much of the original vegetation of the site has been lost.	Replant native vegetation.	Council works and services	CCC	Variable
					There are currently a variety of pest species in and around conservation areas in Belfast, which pose a threat to native flora and fauna. Significant local pest species include Sycamore, Ivy, Potato vine and others.	Clear weeds.	Council works and services	CCC	Variable
11	Proposed new reserve areas	New reserve areas will need to be created as Belfast develops. A number of possible sites for reserves are located in the northern part.	1	Developed in conjunction with the Area Plan	Population growth in the Belfast area will increase pressures on existing reserves and open space areas.	Develop new reserve areas in the North of Belfast.	Land acquisition	CCC	**$$$$$**
					There is a need to ensure that reserve areas have multiple functions, where appropriate, to make them as efficient as possible.	Ensure that new reserve areas have multiple functions, including conservation, recreation and, stormwater retention and treatment.	Reserve master plan	CCC	Variable
12	Clearwater Avenue (Hummerana Road)	An amenity area near Clearwater resort containing native riparian vegetation. The native plants are maintained through mowing.	4	No protection	There is a lack of riparian vegetation along many stretches of waterways within Belfast.	Restore native vegetation on the riparian margins.	Council works and services	CCC Landowner	Variable
					There are currently a variety of pest species in and around conservation areas in Belfast, which pose a threat to native flora and fauna. Significant local pest species include Sycamore, Ivy, Potato vine and others.	Clear introduced weeds and grasses.	Council works and services	CCC Landowner	Variable
13	Styx Mill Basin, Hussey Road Park	A site of planted parkland containing a large number of native species.	4	Protection as a regional park	Much of the original vegetation of the site has been lost.	Replant native species.	Council works and services	CCC	Variable
14	Kaputone Stream, corner of Belfast and Blakes Road	Wide riparian margins containing a mixture of exotic and native wetland plants.	4	No protection (private land)	There are currently a variety of pest species in and around conservation areas in Belfast, which pose a threat to native flora and fauna. Significant local pest species include Sycamore, Ivy, Potato vine and others.	Clear exotic species.	Council works and services	CCC	Variable
					There is a lack of riparian vegetation along many stretches of waterways within Belfast.	Replant the riparian margins with native vegetation.	Council works and services	CCC	Variable
					There is a potential threat to the site from development of the surrounding area.	Protect the area from inappropriate development.	Esplanade reserve/strip Zoning	CCC	Variable
15	Kaputone Stream, Englefield reserve and Crombie Green	An area of parkland occurring on both sides of the Kaputone Stream, which contains limited areas of native riparian planting.	5	No protection	There is a lack of riparian vegetation along many stretches of waterways within Belfast.	Replant and maintain the riparian margin.	Council works and services	CCC	Variable
16	Proposed Northern arterial corridor	The development of the proposed northern arterial could be associated with an ecological or recreation corridor, which would link between important ecological areas.	3	N/A	The proposed northern arterial corridor may be able to provide for recreational and ecological values.	Obtain agreement with New Zealand Transport Agency regarding local use of the land adjacent to the road.	20m wide land purchase Covenants Encumbrances	CCC New Zealand Transport Agency	**$$$$$**

17	Proposed Western Bypass corridor	The development of the proposed western bypass road could be associated with an ecological or recreation corridor, which would link important ecological areas.	5		The proposed western bypass may be able to provide for recreational and ecological values.	Obtain agreement with New Zealand Transport Agency regarding local use of land adjacent to the road.	20m wide land purchase Covenants Encumbrances	CCC New Zealand Transport Agency	**$$$$**
18	Railway corridor	There is potential to create an ecological or recreation corridor adjacent to the railway line that runs through Belfast	3		The railway corridor may provide for significant recreational and ecological values.	Obtain land adjacent to the rail corridor.	Land acquisition	CCC New Zealand Transport Agency OnTrack	**$$$$$**
19	Kaputone Stream, Englefield Belfast	A small, privately owned area of native grass on the margin of the Kaputone River.	5	No protection (private land)	Much of the original vegetation of the site has been lost.	Restore native grasses.	Council works and services	CCC Landowner	Variable
					There are ongoing threats to remaining native vegetation at the site.	Ensure that existing natural values cease their decline.	Land acquisition Covenant	CCC Community Local business	Variable
20	Kaputone site between main north road and the railway	An area of pasture containing native and exotic rushes.	5	No protection (private land)	Much of the original vegetation of the site has been lost.	Support and restore native rushes.	Council works and services Esplanade strip/reserve Land acquisition Designation	CCC	N/A
21	Fence line on Marshland road	A hedgerow supporting a number of native vines.	5	No protection (private land)	Much of the original vegetation of the site has been lost.	Support and restoring native vines.	Council works and services Subdivision covenant Conservation covenant	CCC	N/A
22	Kaputone Stream, Factory Road	A grazing paddock containing a limited number of native cabbage trees.	5	No protection (private land)	Much of the original vegetation of the site has been lost.	Restore and maintain native cabbage trees and other lost natural values.	Council works and services Land acquisition Designation Esplanade strip/reserve	CCC	Variable
23	Gardiners Road near Johns Road	A site containing two large clumps of native vine.	5	No protection	Much of the original vegetation of the site has been lost.	Support and restore native vines.	Council works and services Subdivision covenant Conservation covenant	CCC	N/A
24	Styx Mill Basin, upper (site 2)	A grazing paddock containing a limited number of native herbs.	5	No protection (private land)	Much of the original vegetation of the site has been lost.	Restore lost natural values.	Council works and services Subdivision consent	CCC	N/A
25	Hummerana Road to the Groynes	A small area of wet grassland on the side of the road leading to Clearwater resort. There are a mixture of native and exotic low-growing wetland plants associated with this site.	5	No Protection	Much of the original vegetation of the site has been lost.	Restore lost natural values.	Council works and services	CCC	N/A
26	The Groynes	A large regional park of 92ha on the western boundary of Belfast. The Groynes provides significant open space provision for Belfast residents as well as habitat for fish and birds. The Otukaikino River (the southern branch of	1	Protected in the City Plan as a regional park. Riparian areas within the Groynes are also protected as ecological heritage sites	The Groynes is well protected compared to other areas of significant natural values in the area. However, as Belfast grows there is likely to be increasing recreational use of this area, which will put pressure on existing natural values.	Monitor recreational use of the Groynes, and determine the optimal carrying capacity for the park.	Monitoring	CCC	Variable
						Develop a well-linked network of recreation reserves beyond the Groynes to offset increasing demand for the Groynes.	Strategic land purchase		Variable
					Separation of incompatible user groups, particularly on the waterways.	Restrict recreational use of waterways in sensitive areas.	Enforcement of the Parks and Reserves Bylaw		Variable
					Linking the Groynes with other open space areas in Belfast.	Create a network of green corridors to link the Groynes with other open space and conservation areas in Belfast.	Land purchase		Variable
					Willow management and removal of invasive species, such as Old Man's Beard.	Clear exotic and invasive species.	Council works and services		Variable

		the Waimakariri River) also flows through the Groynes.		in the City Plan.	Protection of threatened plant species, such as Bladderwort.	Protect native species.	Enforcement of the Parks and Reserves Bylaw		Variable
					The effects of the proposed Western Bypass on the Groynes, including possible contaminated runoff, traffic noise and visual distractions. The effects of the positioning and construction of the secondary stopbank.	Monitor the effects of adjacent development, such as the Western Bypass and Secondary stop bank.	Monitoring		Variable

3.6 Natural Values Map



4. Heritage Values

4.1 Introduction

In the context of this report, heritage values are defined as those that relate to the original and subsequent settlement and activities undertaken within the Belfast area by European, Māori and other cultural groups. Heritage values can be associated with places, buildings and objects of historical, cultural or spiritual significance, which contribute to the character of the area and provide a tangible link to the past. The information in this section is taken primarily from a report prepared for the Christchurch City Council by Ohs, Scoon & Tau (2005). This background report should be consulted for a more in-depth analysis of the heritage values in Belfast, and reference details for this text can be found at the end of this document.

European migrants from the first four ships settled in the area between the Waimakariri River and the Styx River in the early 1850s. From the 1850s to 1871, sheep and crop farming were the principal activities undertaken by settlers. Thereafter, many farms were subdivided into smaller residential lots, and significant meat and dairy processing industries emerged. The advent of large-scale industry in Belfast was a catalyst for the development of the Township. By the early twentieth century, Belfast was a significant residential area that contained a town hall, post office, general store, church and public library. European New Zealanders have traditionally dominated the Belfast area, and in 2006, they comprised approximately 82 percent of the area's population.

Although there is not a strong representation of cultural groups other than European and Māori in the early history of Belfast, cultural diversity is increasing in the area and the heritage of these groups will become increasingly significant in the future. This chapter of the greenprint relates primarily to European history. Māori cultural heritage values are considered in the subsequent chapter.

4.2 Heritage values

The European heritage values within Belfast are associated with the everyday life of the original settler society. Values that are most prominent, and which remain to this day, include agriculture, horticulture, industry, residential development and exotic plantings.

4.2.1 Agriculture and horticulture

The original European inhabitants of Belfast were farmers. Most owned approximately 40 hectares of land on which they raised sheep and cattle and grew a variety of crops, including onions, oats, potatoes and fruit. A number of historic farm buildings, pastures and orchards remain in the Belfast area, while others have been lost to development.

4.2.2 Industry

Belfast has been home to a number of important industries since the 1880s. The most significant of these are the frozen meat and milk processing industries. There were also a number of smaller industries associated with the processing of animal products, including a soap works, fellmongery, wool scouring works and fiddle-string works. Belfast's frozen meat industry has survived to this day and the remaining buildings are a prominent landmark of the European industrial heritage of the area. There is also a link from many of the industrial buildings to the railway line that runs through Belfast. In particular, the freezing works buildings are situated in close proximity to the railway line to facilitate the transportation of frozen meat from the site.

4.2.3 Residential development

The development of the township of Belfast was closely linked with the growth of industry, and many of those who inhabited the area were employed in the meat and dairy processing industries. The early township had a number of notable features, including colonial-era housing, a blacksmiths, Anglican and Methodist churches, a general store, town hall, post office, library, school and hotel.

4.2.4 Exotic tree species and cultural landscapes

There are a large number of protected trees in Belfast, which are associated with the early European settlement of the area. They are primarily associated with Kaputone Reserve, Main North Road and historically significant private residences. Listed varieties include Gum, Cypress, Wellingtonia, Willow, Cottonwood, Elm, Palm, Chestnut, Mayten, Magnolia and Tulip trees. Plantings associated with the rural activity in the area are also significant, such as hedgerows, shelterbelts (commonly poplars) and willows along the rivers (planted for bank stabilisation). It is important to note that tree plantings, landscape and waterways have cultural values that reflect past traditions and activities.

4.3 Key Issues

- Identifying and protecting, where possible, significant buildings, structures and landscape features associated with Belfast's early agricultural, horticultural, industrial and residential heritage, from urban development, alteration or destruction;
- Restoring and maintaining heritage places and buildings to a high standard, where possible;
- Integrating heritage places or features within new developments where absolute protection is not attainable or appropriate;
- Acknowledging heritage values where they have been lost;
- Providing community access to and improving understanding of important European heritage places in Belfast.

4.4 Heritage vision

To promote the values and features of Belfast's heritage (including elements that have historical and social significance, cultural and spiritual significance, architectural and artistic significance, group and setting significance, landmark significance, archaeological significance, and technology and craftsmanship significance) and to protect and conserve places of historical and cultural heritage importance.

4.5 Areas of heritage significance

There are numerous European heritage sites in Belfast, which add to the identity and character of the area. The table below describes these important places, highlights the current level of protection and outlines a number of actions, mechanisms and costs associated with the protection and enhancement of heritage places and objects.

Map Number	Site name/location	Description	Perceived value 1 – High 5 – Low	Current Protection	Issues	Recommended actions	Preferred mechanism(s)	Responsibility	Approximate costs
1	Freezing Works (Canterbur	The Canterbury Frozen Meat site was established in the 1880s. A number of	1	None (privately owned)	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine buildings and places meets the threshold for listing in the City Plan. If the threshold for heritage	Heritage research	CCC	$

	y Frozen Meats)	original freezing works buildings remain on this site, which were designed by notable Canterbury architect Joseph Clarkson Madison.				listing in the City Plan is met, include a plan change as a Protected Heritage Item.			
					Possible closure and redevelopment of the freezing works in the coming years may threaten the existing heritage values associated with the site.	Address the opportunities and effects of the potential closure of the freezing works.	Advocacy and liaison with land owners.	CCC Local business Developers	Variable
					Any redevelopment of the site threatens the historic buildings on the site.	Work with owner/developer towards retention and adaptive reuse of significant buildings and retention of significant landscape features.	Advocacy	CCC Community Developers	N/A (As there is a low priority for this mechanism)
					Some of the heritage buildings on the site may be able to be retrofitted to function as an important community resource.	Investigate purchase for community service use.	Council purchase	CCC	$
2	7 Mile peg	An historical survey peg, which is thought to be located somewhere on the site of seven mile peg hotel	3	Within Council Road Reserve The archaeological provisions in the Historic Places Act provide for the protection of this site	It is unclear what remains of this site.	Undertake research to determine if this survey marker still exists.	Heritage research	CCC	$
					The increasing development of Belfast may threaten existing heritage items at the site.	Utilise archaeological provisions in the Historic Places Act.	Heritage conservation policy	CCC	N/A
					Many Belfast residents are unaware of the significance of the site.	Increase public awareness.	Heritage trail Public education Heritage week Heritage publication/ interpretation Council website	CCC	$
					There may be threats to the site associated with road widening and damage.	Protect the site from road widening, removal or damage.	N/A	CCC NZ Transport Agency	Variable
3	McLean's Island War Memorial	The McLean's Island war memorial is a monument to residents who lost their lives during World War One and Two and is characterised by a large granite column.	1	None	There is a general lack of visual amenity associated with the site.	Improve seating and planting to increase the amenity of the memorial.	Council works and services	CCC	$$
					The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if it meets the threshold for heritage listing in the City Plan. If it meets the threshold, for heritage listing, include a plan change as a Protected Heritage Item.	Heritage research and assessment Plan change	CCC	
					There is a lack of appropriate signage associated with the site.	Improve signposting associated with the memorial.	Signage and interpretation	CCC	
					There is currently a lack of parking associated with the site.	Improve parking provision for visitors to the memorial.	Council works and services Land acquisition	CCC	
					Many of the residents of Belfast may be unaware of the existence and significance of the memorial.	Increase public awareness.	Heritage trail Public education Heritage week Heritage publication/ interpretation Council website	CCC	
					There is a lack of recognition and prominence given to the memorial.	Ensure that the memorial is highly visible and not overlooked during any future development.	Signage and interpretation Zoning	CCC	
4	Seven Mile Peg Hotel	This building has been a hotel since 1867 and was originally an important lodging for travellers who were waiting to cross the Waimakariri River during times of flooding.	3	None (privately owned)	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if the hotel meets the threshold for heritage listing in the City Plan. If it meets the threshold, for heritage listing, include in a plan change as a Protected Heritage Item.	Heritage research and assessment Plan change	CCC	$
					The residents of Belfast may be unaware of the significance of the site.	Increase public awareness.	Heritage trail Public education Heritage week Heritage	CCC Local history group/museum	$

							publication Council website		
					There is a lack of visual amenity in the area surrounding the park.	Enhance the amenity of the land surrounding the hotel.	Council works and services Design guides	CCC	Variable
					There may be threats to the site associated with future road widening.	Protect the site from road widening.	N/A	CCC Transit NZ	Variable
5	Kaputone Wool Scouring Works	The Kaputone Wool Scouring Works was one of the first sites of industrial activity in Belfast and at different times has also been associated with soap making, fell mongery and meat preserving.	1	None (privately owned)	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if it meets the threshold for heritage listing in the City Plan. If it meets the threshold for heritage listing, include plan change as a Protected Heritage Item.	Heritage research and assessment City Plan	CCC	$
					The residents of Belfast may be unaware of the significance of the site.	Increase public awareness.	Heritage trail Public education Heritage week Heritage publication Council website	CCC Community Local history group/ museum	$
6	Sheldon Park War memorial	The Sheldon Park war memorial commemorates the men from the district that died in the first and second world wars. The monument is an obelisk constructed of Halswell stone, with a stepped base of concrete.	1	Protected by the Reserves Act	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if it meets the threshold for heritage listing in the City Plan. If it meets the threshold for heritage listing, include plan change as a Protected Heritage Item.	Heritage research	CCC	$$
					There is a lack of visual amenity associated with the site.	Create a more defined and attractive setting for the memorial.	Council works and services Design guides	CCC	$
					The residents of Belfast may be unaware of the significance of the site.	Increase public awareness.	Heritage trail Public education Heritage week Heritage publication Council website	CCC Local history group/museum	$
					There may be threats to the site associated with future road widening.	Protect the area from road widening.	N/A	CCC NZ transport agency	Variable
7	Kapuatohe Reserve	In the 1880s, Kapuatohe reserve was historically part of a government settlement scheme for new immigrants. In 1977, 2000m^2 of this site was bought by the Waimari District Council and set up as a historic reserve.	1	Protected under the Reserves Act	Urban development and population growth may place more pressure on the site.	Maintain current levels of protection of heritage values.	Management Plan	CCC	$
					The residents of Belfast may be unaware of the significance of the site.	Increase public awareness.	Heritage trail Public education Heritage week Heritage publication Council website	CCC Local history group/museum	$
8	Belfast historic school house	The Belfast Schoolhouse opened in 1878 and is an excellent example of a colonial vernacular style building. The Schoolhouse, together with Crofter's Cottage, is also part of the historic Kapuatohe Reserve.	1	Group two listing in the City Plan Category two listing with the New Zealand Historic Places Trust (NZHPT)	The schoolhouse is an important heritage item in the Belfast area and it will be important to ensure that it retains a high level of significance in years to come.	Revise and implement conservation management plan for the schoolhouse.	Conservation plan Management plan	CCC	$
						Ongoing maintenance and conservation.	Council works and services	CCC	Ongoing
9	Crofter's Cottage	Crofter's Cottage was established around the same time as the Belfast	1	Group two listing in the City Plan.	The cottage is an important heritage item in the Belfast area and it will be important to ensure that it retains a high level of significance in years to come.	Revise and implement conservation management plan for the cottage.	Management plan	CCC	$

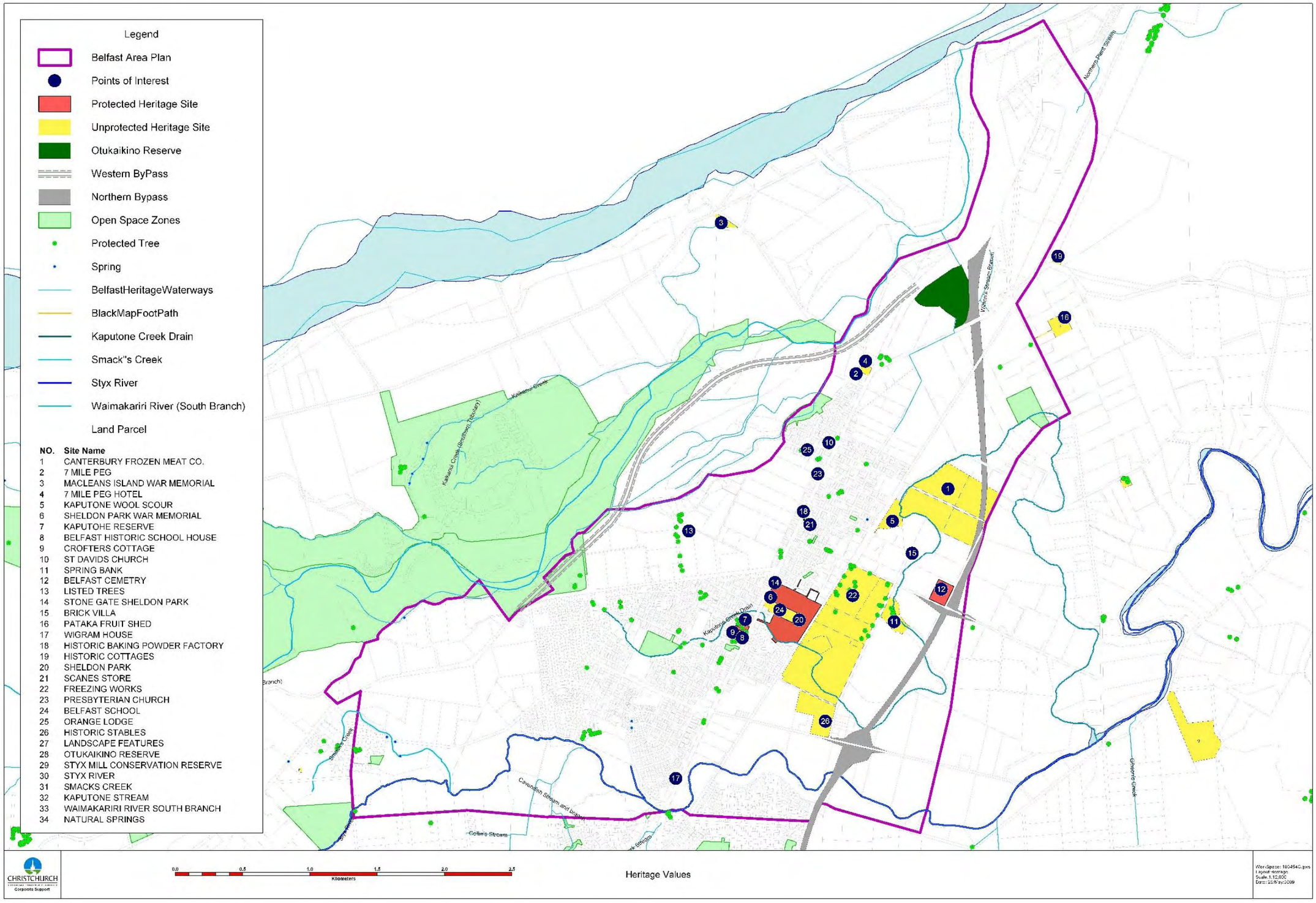
		School house and is another example of a colonial vernacular style building.				Ongoing maintenance and conservation.	Council works and services	CCC	Ongoing
10	St David's Church	St David's Church was constructed in 1903 and is built on the site of the first Church in Belfast. The church was designed by notable architect Samuel Hurst Seagar and is an example of early English Gothic Revival.	1	Group one listing in the City Plan Category two listing with the NZHPT	The residents of Belfast may be unaware of the significance of the site.	Increase community awareness and use of the church.	Public education Heritage week Heritage publication/ interpretation Council website Heritage trail	CCC Local history group/museum	$
					There is a lack of visual amenity in the land area surrounding the church.	Improve the amenity of the land surrounding the church.	Council works and services Design guides	CCC Landowner	Variable
					The Church is not a prominent heritage item within Belfast.	Increase the visibility of the church from the road.	Signage and interpretation	CCC	$
					There may be threats to the site associated with future road widening.	Protect the area from road widening.	N/A	CCC New Zealand Transport Agency	Variable
					There is currently a lack of parking associated with the site.	Improve parking and access to the site.	Management Plan and liaison with the Church	CCC	$
11	Spring Grove	Constructed in 1897, Spring Grove was owned by the prominent Nicolls family and is an excellent example of a late Victorian timber house.	1	Group two listing in the City Plan and Category two listing with the NZHPT	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if the farm buildings and setting meet the threshold for heritage listing in the City Plan. If it meets the threshold for a heritage listing, include in a plan change as a Protected Heritage Item.	Heritage research and assessment Plan change	CCC	$
					The residents of Belfast may be unaware of the significance of the site.	Increase public awareness of the property.	Public education Heritage week Heritage publication/ interpretation Council website Heritage trail	CCC	$
					The gardens and house associated with the Spring Grove site provide a unique asset for Belfast, which could form the basis of a community resource.	Investigate possible council purchase for the creation of a possible northern 'Mona Vale'.	Council purchase	CCC	Variable
					While there is a level of statutory protection for the site, there are still threats associated with development of the land and the use of buildings.	Work with owner/developer towards retention and adaptive reuse of significant buildings and retention of significant landscape features.	Partnerships with the private sector	CCC Local business Owner/developer	N/A
12	Belfast Cemetery	Established in 1904, this site has historical significance as the burial site of many of the founding residents of Belfast.	1	Protected as a Conservation 2 zone in the City Plan.	The residents of Belfast may be unaware of the significance of the site.	Increase public awareness.	Public education Heritage week Heritage publication/ interpretation Council website Heritage trail	CCC Local history group/ museum	$
					The cemetery has significant heritage values associated with it, and will require higher levels of protection as Belfast continues to develop.	Investigate the possibility of a heritage listing for the cemetery in the City Plan.	Heritage research and listing	CCC	$
					As with other historic cemeteries in the city, the site is threatened by inappropriate cleaning or restoration.	Protect the site from inappropriate cleaning or restoration.	Cemetery Management Plan CCC asset management – manage as heritage asset	CCC Community	$
13	Listed trees	In the Belfast area, there are a number of listed trees. These trees are	3	Protection under the City Plan	There will be a growing threat to existing listed trees in Belfast associated with population growth and urban development.	Continue to protect and maintain listed and other significant trees.	Council works and services	CCC	Ongoing
						Ensure that listed trees are not disturbed by the ongoing	Monitoring and	CCC	

		listed in the Christchurch City Plan as either heritage or notable. All of the listed trees are located on Johns Road, Main North Road or Blakes Road.				development of Belfast.	enforcement	Developer	
					There is currently a lack of knowledge regarding trees that may require listing within the City Plan.	Identify and assess further trees for possible protection in the City Plan.	Council works and services City Plan	CCC	
					The residents of Belfast may be unaware of significance of heritage trees in the area.	Raise public awareness about the significance of heritage trees and associated cultural values.	Public education Signage and interpretation Heritage publication Heritage week Council website	CCC Local history group/ museum	Ongoing
14	Stone fence and entrance gate to Sheldon Park	This stone fence with iron gates was erected at the entrance to Sheldon Park in memory of William Nicoll, upon his death in 1920.	3	Protected under the Reserves Act	There is a lack of community engagement and understanding of the significance of the stone fence.	Create a footpath to encourage foot traffic along the fence line.	Construction costs	CCC	$
					The fence may be threatened by population growth and urban development.	Provide for protection in reserves management plan.	Management plans	CCC	N/A
					There may be threats to the site associated with future road widening.	Protecting the site from road widening.	N/A	CCC New Zealand Transport Agency	Variable
15	Brick Villa	This Brick Villa was the home of a well-known local Engineer. It is a good example of a Square Plan Villa and may have been designed by notable architect Samuel Hurst Seagar.	1	None (privately owned)	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if the villa meets the threshold for heritage listing in the City Plan. If it meets the threshold for listing in the City Plan, include a plan change as a protected heritage item.	Heritage research and assessment Plan change	CCC	$
					As this building is in private ownership, there are threats to this site associated with development of the land and the use of buildings.	Work with owner/developer towards retention and adaptive reuse of significant buildings and retention of significant landscape features.	Partnerships with the private sector	CCC Community Developer	$$
16	Pataka fruit shed	Brick fruit shed dating from 1880 in Marshlands Road	3	Group 3 protected heritage item.	The residents of Belfast may be unaware of significance of fruit shed.	Increase public awareness.	Public education Signage and interpretation Heritage publication Heritage week Council website	CCC Local history group/museum	Ongoing
17	Wigram House	This property was purchased in 1896 by the first Mayor of Christchurch, Henry Wigram, and was originally located on the corner of Park Terrace and 26 Armagh Street. Part of the building was relocated to Belfast in the 1980s.	4	None (privately owned)	The heritage significance of the site is not well known.	Removed from City Plan list due to relocation in past. Undertake heritage research and assess the significance to determine if the property meets the threshold for heritage listing in the City Plan. If it meets the threshold, include a plan change as a protected heritage item.	Heritage research and assessment Plan	CCC	$
					The significance of this site may not be well known.	Increase public awareness.	Public education Signage and interpretation Heritage publication Heritage week Council website	CCC Community	$
					As this building is in private ownership, there are threats to this site associated with development of the land and the use of buildings.	Work with owner/developer towards retention and adaptive reuse of building and retention of appropriate setting.	Partnerships with the private sector	CCC Community Developer	$$
18	Former Baking Powder factory	This small brick building was built around 1915 and was originally a baking powder factory.	4	None	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if the site meets the threshold for heritage listing in the City Plan. If it meets the threshold for heritage listing, include a plan change as a protected heritage item.	Heritage research and assessment Plan change	CCC	$
					There may be threats to the site associated with future road widening.	Protect the site from road widening.	N/A	CCC New Zealand Transport Agency	Variable
					Residents of Belfast may be unaware of the significance	Increase public awareness.	Public education	CCC	$

					of the Baking Powder Factory.		Signage and interpretation Heritage publication Heritage week Council website Heritage trail	Community	
19	Early houses and workers cottages	There are a number of good examples of colonial cottages, villas, bay villas and bungalows concentrated around Darroch, Richill, Third, Tyrone, Donegal Streets and Radcliffe Road.	4	None (privately owned)	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if the site meets the threshold for heritage listing in the City Plan. If it meets the threshold for heritage listing, include a plan change as a protected heritage item.	Heritage research and assessment Plan change	CCC	$$
					There needs to be a greater level of appreciation of the heritage values associated with a number of the privately owned, older cottages and buildings in Belfast.	Raise awareness among property owners of ways to restore and enhance their cottages in a sympathetic manner that would enhance their area greatly and make local property more desirable due to character provided by older houses.	Public education Heritage brochures and booklets	CCC Community	$
						Recognise the restoration work by owners with heritage awards.	Community Board Heritage awards	CCC	$
						Undertake mail outs to owners with contact details of the Historic Places Trust for helpful information on restoration.	Public education Heritage brochures and booklets	CCC	$
					As Belfast continues to develop, there needs to be greater efforts placed on the conservation of older residential properties in the area.	Investigate the possibility of creating residential conservation areas.	Consider Belfast area in the future residential conservation areas study	CCC	$$
20	Sheldon Park	Opened in 1912, Sheldon Park was originally a gift from William Nicoll to the people of Belfast in memory of his late wife.	1	Protected as a recreation reserve under the Reserves Act	There are threats to the coherence and possible expansion of this reserve associated with the development of surrounding land areas.	Provide for protection and promotion of historical association in reserves management plan.	Reserves plan	CCC	N/A
					There is a lack of community appreciation for the heritage value of Sheldon Park.	Promote historical association and memorial function and increase public awareness.	Public education Signage and interpretation Heritage publication Heritage week Council website Heritage trail	CCC	$
					As Belfast grows, Sheldon Park will become an increasingly important community hub, and it is imperative that residents have input into the management of the site.	Manage future growth and development in conjunction with a Strategic Plan for the Park that includes community input.	Management Plan under the Reserves Act	CCC Community	$$
					There may be threats to the site associated with future road widening.	Protect the site from road widening.	N/A	CCC New Zealand Transport Agency	Variable
21	Scanes Store	Built by the Scanes Family in 1913 and run as a general store for over two generation, this building provides a good example of a Bullnose Veranda and is prominently situated adjacent to Main North Road.	1	Group 3 City Plan heritage listing	Residents of Belfast may be unaware of the historical significance of Scanes Store.	Increase public awareness.	Public education Heritage week Heritage publication Signage and interpretation Council website Heritage trail	CCC	$
					There is a lack of visual amenity and appropriate context associated with the shop.	Create a more appropriate setting for the corner shop.	Design guides	CCC Local business	$
					There may be threats to the site associated with future road widening.	Protect the site from road widening.	Council works and services	CCC Local business	Variable
22	Freezing	Some buildings,	1	None	The heritage significance of the site is not well known.	Undertake heritage research to determine if the site	Heritage research	CCC	$

	Works (Brothworks site)	landscape features and the site is significant for its association with the frozen meat industry.				meets the threshold for heritage listing in the City Plan. If it meets the threshold for heritage listing, include in a plan change as a Protected Heritage Item.			
					There are threats to the site associated with potential closure and redevelopment, which may lead to the destruction of important heritage items.	Address the effects of the potential closure of the freezing works.	N/A	CCC Local business	N/A
					As this building is in private ownership, there are threats to this site associated with development of the land and the use of buildings.	Work with owner/developer towards retention and adaptive reuse of building and retention of appropriate setting.	Advocacy Development guidelines	CCC Community Developer	N/A
23	Presbyterian Church	The Presbyterian Church in Belfast opened in 1896 and, although it has been altered, some features of the original building remain.	3	None	The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if the site meets the threshold for listing in the City Plan. If it meets the threshold for heritage listing, include a plan change as a Protected Heritage Item.	Heritage research Council works and services	CCC	$
					There may be threats to the site associated with future road widening.	Protect the site from road widening.	N/A	CCC NZ Transport Agency	Variable
					The residents of Belfast may be unaware of historical significance of the church.	Increase public awareness.	Public education Heritage week Heritage publication/ interpretation Council website Heritage trail	CCC Community	$
24	Belfast School	Belfast School was opened in 1938 and was modelled on an open-air plan that was popular in the 1920s and 1930s.	3	None (Currently used as a school)	There may be threats to the site associated with future road widening.	Protect the site from road widening.	N/A	CCC NZ Transport Agency	Variable
					The projected population increase in Belfast associated with urban development is likely to increase the pressure on the school.	Encourage retrofit of original school buildings to accommodate an increased population.	Advocacy	CCC Ministry of Education	N/A
					The Belfast community may be unaware of the historical significance of Belfast School.	Increase public awareness.	Public education Heritage week Heritage publication/ interpretation Council website Heritage trail	CCC Community	$
					The heritage significance of the site is not well known.	Undertake heritage research and assess significance to determine if the site meets the threshold for heritage listing in the City Plan. If it meets the threshold for heritage listing, include in a plan change as a Protected Heritage Item.	Heritage research	CCC	$
25	Lodges	A former Orange Lodge still stands at 14 Darroch Street and this was once the site of local dances.	5	None	The Belfast community may be unaware of the existence and historical significance of the lodge.	Increase public awareness.	Public education Heritage week Heritage publication/ interpretation Council website Heritage trail	CCC Community	$
					Owing to a lack a statutory protection, there are threats to this site associated with the possible redevelopment of the site of unsympathetic reuse.	Advocate for retention and adaptive reuse of building and retention of appropriate setting	Advocacy	CCC	N/A
26	Historic stables	An old farm building located that may have once been used as stables is situated at 17 Blakes Road.	5	None	Owing to a lack a statutory protection, there are threats to this site associated with the possible redevelopment of the site of unsympathetic reuse.	Advocate for retention and adaptive reuse of building and retention of appropriate setting.	Advocacy	CCC	$$
27	Landscape features	Shelterbelts (poplars), hedges, macro	4	None	These historically significant landscape features have little or no protection, and will be threatened by possible redevelopment.	Protect and retain as part of new developments or reserves to reflect rural history of the area.	Development guidelines Advocacy	CCC Developers	N/A

4.7 Heritage Values Map



5 Tangata whenua values

5.1 Introduction

Belfast has long been a highly significant area for local tangata whenua. The area was prized for food and resource gathering as well as cultural and spiritual practices. Harakeke (flax), Ti Kouka (cabbage tree) and Raupo (bulrush) dominated the vast swamplands of the area now known as Belfast. This area was also a gathering ground for Putangitangi (Paradise Shelduck), Parera (Grey Duck), Weka and Kiwi. Belfast was also an important thoroughfare and resting area for Ngāi Tahu travelling between Kaiapoi and Banks Peninsula. Māori have a long history of activity and settlement within Belfast, and in 2006, they comprised approximately 8 percent of the residential population within the area.

The information in this section is taken primarily from a report prepared for the Christchurch City Council by Ohs, Scoon & Tau (2005). This background report should be consulted for a more in-depth analysis of the heritage values in Belfast, and reference details for this text can be found at the end of this document.

5.2 Māori heritage values

Unlike European heritage values, which are primarily associated with commerce and urban development, Māori place a high value on the life sustaining and spiritual qualities of Belfast, particularly those associated with the land and water. Ngāi Tahu and, in particular, Ngāi Tu rūnanga are the tribal groups that have the main association with the area. The relationship between Ngāi Tahu, and the Ngāi Tu Ahuriri rūnanga is outlined fully in the cultural heritage background report to the Belfast area plan. In summary, Te rūnanga o Ngāi Tahu, is the tribal representative body of Ngāi Tahu whanui. It is a body corporate established on 24th April 1996 under section 16 of Te rūnanga o Ngāi Tahu Act 1996. The area where Ngāi Tahu are tangata whenua is also clearly articulated in both the Te Rūnanga o Ngāi Tahu Act and the Ngāi Tahu Claims Settlement Act. Te rūnanga o Ngāi Tahu consists of 18 constituent papatipu rūnanga, each of which is identified in the First Schedule of the Te rūnanga o Ngāi Tahu Act along with a description of each rūnanga's area of authority. The Schedule declares the Ngāi Tu Ahuriri rūnanga as the rūnanga holding manawhenua within the Waipara region, which encompasses the Belfast Area as is subject to this Area Plan. Te rūnanga O Ngāi Tahu also has a consultation protocol between itself and papatipu rūnanga, including the Ngāi Tu Ahuriri rūnanga. The protocol recognises that the 18 papatipu rūnanga are the kaitiaki (guardians) of the natural and physical resources within their respective takiwa (areas) and, as such, provides for each papatipu rūnanga to exercise rangatiratanga (sovereignty) over their respective areas concerning these resources.

5.2.1 Land

Traditional Māori culture has a strong connection to the environment, particularly the land. Land confers dignity and rank, establishes personal and tribal identity, is the resting place for the dead, a spiritual base for traditional beliefs, a symbol of social stability and an important source of emotional and spiritual strength. Areas of land that have the greatest heritage value are those associated with food and resource gathering, burial and embalming practices. A number of such sites exist in the Belfast area and these will require a significant degree of protection during urban development.

5.2.2 Water

According to Māori beliefs, water is the source of all life, and the purity of water is closely connected to the welfare of the people. Access to fresh, clean water was of great importance for Māori settlements, which were often located near significant waterways for food gathering, recreation and cultural practices. There are a number of prominent waterways than run across Belfast, including the Styx River and the South Branch of the Waimakariri River, and the purity and accessibility of these are highly valued by Ngāi Tahu.

5.2.3 Mahinga Kai

Mahinga kai refers to traditional food gathering practices, including the whole food chain from mountains to the sea, which is central to the Ngāi Tahu way of life. Mahinga kai is important for community welfare and is regarded as sacred by Māori. The gathering, offering and exchange of food is closely associated with the mana (prestige) and identity of a tribe and its people. There are both land and water sites in Belfast that are associated with historic food gathering activities. Of particular note is the so-called 'Maori footpath', which roughly follows the path of Main North Road. This was a traditional food-gathering route for Ngāi Tahu, and the iwi has advocated for greater recognition and restoration of the path. In the wider catchment, a number of mahinga kai sites have begun to be developed for local people to harvest the resources. The pa harakeke (flax garden) at Janet Stewart reserve to the east of Belfast is a good example of this; however, sites within Belfast may also be required.

5.2.4 Taonga

Taonga refer to cultural treasures that are highly prized by Tangata whenua. In the Belfast area, there are 9 species of bird, 24 plant species and 2 fish species that are regarded as taonga. In addition to wildlife, waterways and reserve land are also regarded as taonga. Ngāi Tahu claim that all natural resources (including land, waterways and wetlands) within Belfast are taonga and should be used wisely to preserve the resource for future generations. For this reason, all of the sites identified in this section as being significant to Ngāi Tahu are regarding as having a high value, recognising the special relationship between tangata whenua and the environment.

5.2.5 Wāhi tapu

Wāhi tapu sites are an important example of taonga, which refer to places held in reverence by Māori according to tribal custom and history. These places are usually associated with tribal mythology or historical events and activities. Many of these places are well known, but the location of some is kept secret to minimise the chances of disturbance. There are a number of wāhi tapu sites within the Belfast area, which will require significant levels of protection during urban development.

5.3 Key Issues

- Identifying and protecting land areas and waterways that have cultural significance for local Māori from inappropriate land activities, urban development, degradation and disruption to flows;
- Improving the capacity of the environment to support sustainable cultural harvest;
- Ensuring that 'Accidental Discovery Protocols' with Te Rūnanga o Ngāi Tahu and the New Zealand Historic Places Trust are applied to all subdivisions, and significant land use changes in the area to ensure appropriate management should sites be uncovered on private or public land;
- Adapting heritage sites for contemporary uses, in partnership with Ngāi Tahu and Ngāi Tu Ahuriri, where traditional uses cannot be maintained;
- Acknowledging heritage values where they have been lost;
- Providing community access to and improving understanding of Māori cultural heritage places in Belfast.

5.4 Tangata whenua vision

To promote and develop Māori cultural heritage within Belfast and conserve and restore places of cultural importance.

5.6 Areas of cultural significance

The Māori cultural heritage sites in Belfast are a cornerstone of the identity and mana of the local tangata whenua and add to the character of the area. The table below describes these important places, highlights the current level of protection and outlines a number of actions, mechanisms and costs associated with the protection and enhancement of cultural heritage sites.

Map Number	Site name/location	Description	Perceived value 1 – High 5 – Low	Current Protection	Issues	Recommended actions	Preferred mechanism(s)	Responsibility	Approximate costs
1	Wāhi tapu and wāhi taonga sites	A number of wāhi tapu and wāhi taonga sites have been identified in the Belfast area, one of which is an urupā associated with Ōtūkaikino Pool.	1	Limited protection and reliance on consultation procedures with tangata whenua	Urban growth and development may lead to the disruption of sites of significance for tangata whenua.	Identify any other sites known to Ngāi Tahu in area. Site locations protected if required - identify general locality of wāhi tapu and wāhi taonga sites where agreed with Ngāi Tahu.	Ngāi Tahu research Rūnanga consultation	CCC Ngāi Tahu	$$
					Some sites of cultural significance have been lost during past development.	Use interpretation to inform the public about these sites and/or the significance of the area where Te Ngāi Tūāhuriri Rūnanga determine this is appropriate.	Interpretation and/or markers Ngāi Tahu/ CCC collaborative project	CCC Ngāi Tahu	$
					Urban growth and development poses a threat to sites of cultural significance for tangata whenua.	Ensure wāhi tapu and wāhi taonga sites are excluded from proposed development areas. In event of development, require resource consents and addressing effects on wāhi tapu.	Zoning Resource consent assessments Rūnanga consultation	CCC Ngāi Tahu	Ongoing
2	Main North Road footpath	Before it was a major transport corridor for automobiles, Main North Road was a traditional footpath or travel route for Ngāi Tahu, which connected settlement areas in Ōtautahi with those in Kaiapoi.	3	None	It would be difficult to determine the route for a possible redevelopment of a Māori footpath	Identify location of 'footpath' and ascertain whether opportunity to restore in particular areas, and consult with Te Ngāi Tūāhuriri Rūnanga.	Ngāi Tahu/Heritage research Rūnanga Consultation	CCC Ngāi Tahu	Variable
					There is a lack of understanding among the public about the cultural history of the area.	Inform local Belfast community about the option of restoring or marking this traditional footpath.	Public education	CCC	$
						If opportunity & agreement, restore or mark original footpath at appropriate locations.	Restoration Project	CCC Ngāi Tahu	$$
3	Ōtūkaikino Reserve	Ōtūkaikino Reserve is a 13-hectare DOC reserve located at the southern end of the northern motorway. Ngāi Tahu has identified this freshwater wetland as a wāhi tapu site.	1	Protected under agreement between DOC and the CCC	A culturally sensitive urupā site is located in close proximity to Ōtūkaikino Reserve.	Ensure effects of adjacent development do not adversely affect the wāhi tapu. Consult with Tūāhuriri Rūnanga about any proposed development adjacent to Ōtūkaikino to assess whether it will affect the wāhi tapu.	Resource consent Assessments Rūnanga consultation	CCC Developers	Ongoing
					Greenfield development in Belfast poses a threat to culturally sensitive land that is in close proximity to the reserve.	Avoid greenfield development on culturally significant reserve land. Consult with Te Ngāi Tūāhuriri Rūnanga re. role in reserve management.	Zoning Reserve Management	CCC CCC Ngāi Tahu	N/A
					Possible road widening may pose a threat to the Reserve.	Protect reserve areas from road widening.	N/A	CCC	Variable
					Urban growth and development poses a threat to the Reserve.	Maintain the current levels of protection and management.	N/A	CCC Ngāi Tahu	Ongoing
4	Kapuatohe Reserve	Kapuatohe Reserve is a 2000m^2 area of land, which was a traditional resting area for Māori travelling from Tuahiwi to Lyttleton.	4	Protected under the Reserves Act	Urban growth and development in the surrounding areas pose a threat to the reserve	Develop a conservation management plan for Kapuatohe Reserve in partnership with Te Ngāi Tūāhuriri Rūnanga.	Conservation management plan	CCC Ngāi Tahu	$
						Avoid greenfield development on culturally significant reserve land.	Zoning	CCC	N/A

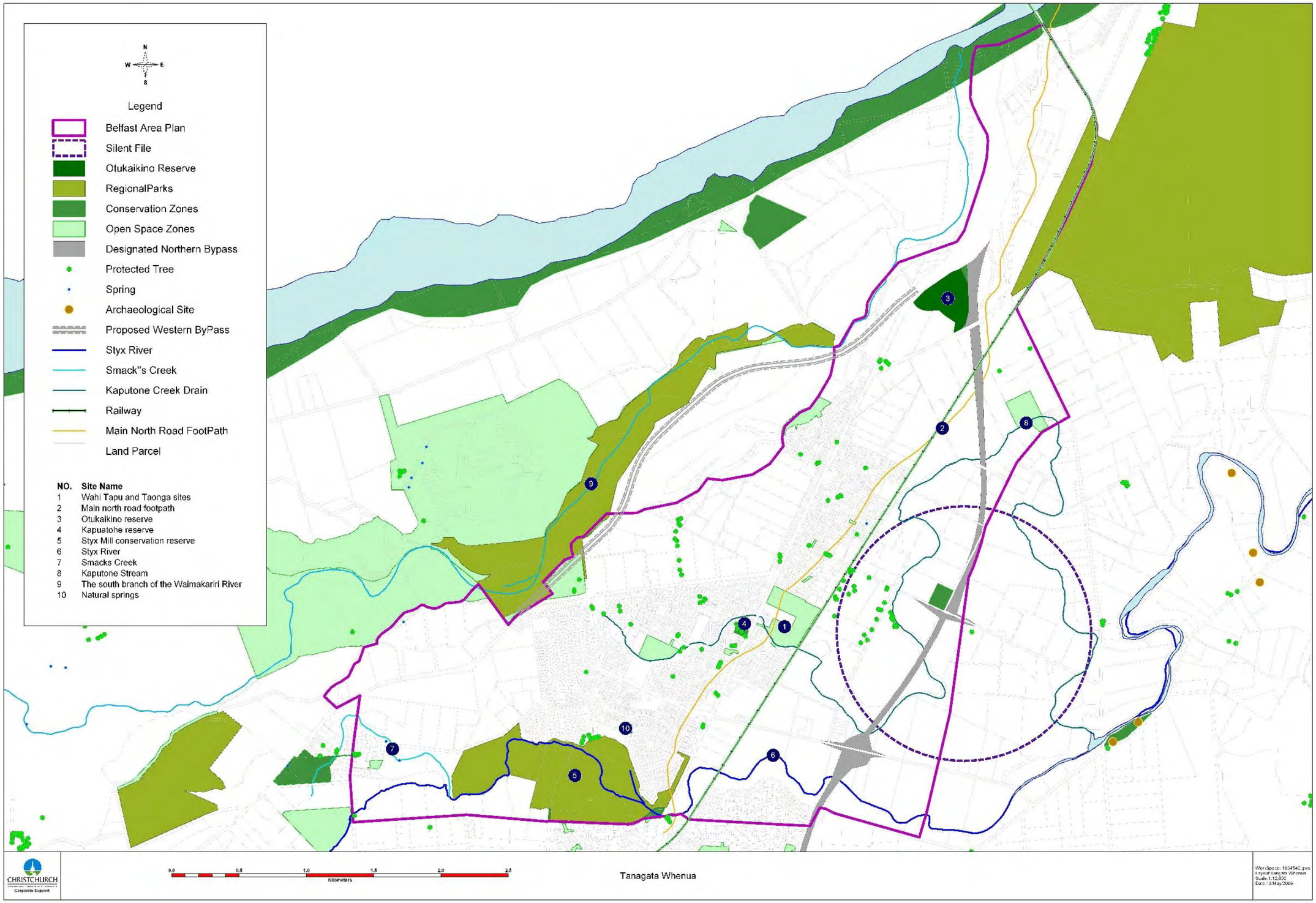
		It is also the location of the Belfast School House and Crofter's Cottage.				Consult with Te Ngāi Tūāhuriri Rūnanga re. role in reserve management.	Reserve Management	CCC Ngāi Tahu	
						Protect reserve areas from road widening.	N/A	CCC	Variable
						Maintain the current levels of protection and management.	N/A	CCC	Ongoing
5	Styx Mill Conservation Reserve	The Styx Mill Conservation reserve is a 53-hectare reserve located to the south of the Belfast Study area. This area and catchment was a valuable mahinga kai and provided a source of raw materials.	2	Listed in the City Plan as an ecological heritage site and protection as a regional park	Urban growth and development in the surrounding areas pose a threat to the reserve, which is one of the most significant open space and conservation areas.	Avoid greenfield development on culturally significant reserve land. Consult with Te Ngāi Tūāhuriri Rūnanga re. role in reserve management.	Zoning Reserve Management	CCC CCC Ngāi Tahu	N/A
						Protect reserve areas from road widening.	N/A	CCC	Variable
						Maintain the current levels of protection and management.	N/A	CCC	Ongoing
6	Puharakekenui / Styx River	This river and associated wetlands were an important mahinga kai, and also used for the cultivation and harvesting of harakeke (flax). Other crops were grown on the river terraces. The mauri and ecological health of this river is of concern to Ngāi Tahu. Wāhi tapu sites exist in the Styx/Puharakekenui but their location remains undisclosed. The traditional Māori name for the Styx was Puharakekenui. The south branch of the Puharakekenui was known as Tao Whaka Puru. Tūāhuriri Rūnanga has proposed the establishment of a Mahikakai (Mahinga kai) Cultural Park within the Puharakekenui/Styx river and Te Rui o Te Aika Kawa/Brooklands Lagoon Catchment.	1	Some protection under the City Plan Protection of water quality and quantity by ECan under the PNRRP and Water Quality Standards CCC Global Consent	Urban growth and development may encroach on the margins of the Styx River, threatening water quality and flow.	Protect waterways and their margins from modification, reductions in water flow, changing land use and contamination. Create an esplanade reserve with minimum width of 20 metres along the river. Ensure indigenous vegetation along riparian margins. On-site stormwater collection & treatment.	Esplanade reserves Styx ICMP & Quality Standards Stormwater Treatment & Detention areas Development Contributions Riparian margins & Planted setbacks District plan requires Low Impact Urban Design	CCC Community Local business Developer	See Natural Values Table #1
					The growth of Belfast poses a threat to Ngāi Tahu's use of the waterway and the resources they provide. Enhance Ngāi Tahu identity and relationships with Puharakekenui.	Develop a partnership with Te Ngāi Tūāhuriri Rūnanga for future restoration projects to enhance the mauri of the river and aquatic habitats, and to provide resources for cultural practices. Create an esplanade reserve and/or mahinga kai reserve with minimum width of 20 metres along the river. Ensure indigenous vegetation along riparian margins, including mahinga kai species. Ensure water quality standards adopted to support mahinga kai gathering. Work with Te Ngāi Tūāhuriri Rūnanga to develop the concept of Te Awa Whakaio Whakapapa Whenua – the marking of the Puharakekenui with a series of traditional artworks or pouwhenua by Ngāi Tahu artists depicting tangata whenua stories associated with this place. Consult with Te Ngāi Tūāhuriri Rūnanga re. appropriate naming in the area.	Partnership and consultation with Te Ngāi Tūāhuriri Rūnanga and Te Rūnanga o Ngāi Tahu Mahinga Kai Reserve State of Takiwā Monitoring Tangata Whenua Public Space Artworks	CCC Ngāi Tahu	Ongoing

					The location of infrastructure and development may have negative effects on ground water flows in the area.	Carefully manage infrastructure placement to reduce the effects on ground water flows.	Zoning Stormwater Treatment & Detention areas	CCC	Ongoing
					Development and associated excavation in the Belfast area may result in increasing inflows of silt and contaminated surface water runoff and the loss of riparian vegetation.	Avoid and mitigate effects of silt runoff and reduced water quality from loss of riparian vegetation, increasing urbanisation and horticultural activity.	Esplanade reserve Riparian margins & Planted setbacks Stormwater Treatment & Detention areas	CCC Community Local business Developer	Ongoing
						Reduce the amount of waste, sediment and contaminated surface water runoff entering culturally significant waterways.	Esplanade reserve Riparian margins & Planted setbacks Stormwater Treatment & Detention areas	CCC Community Local business Developer	Ongoing
					The Northern Arterial motorway will cross the Styx River and may have a possible negative impact in terms of water quality.	Protect the Puharakekenui/Styx River in the areas where it will be crossed by the Northern Arterial designation.	Esplanade reserve designation NZTA Management Plan	CCC Transit NZ	See Natural Values Table #1
7	Smacks Creek	A spring-fed tributary of the Styx River/Puharakekenui. This was an important mahinga kai area. The mauri and ecological health of this waterway is of concern to Ngāi Tahu.	2	Some protection under the City Plan Protection of water quality and quantity by ECan under the PNRRP and Water Quality Standards CCC Global Consent	Urban growth and development may encroach on the margins of the Styx River, threatening water quality and flow.	Protect waterways and their margins from modification, reductions in water flow, changing land use and contamination. Create an esplanade reserve along creek. Ensure indigenous vegetation along riparian margins. On-site stormwater collection & treatment Protect spring source area from development. Separate stormwater discharges from spring source area.	Esplanade reserves Styx ICMP & Quality Standards Stormwater Treatment & Detention areas Development Contributions Riparian margins & Planted setbacks District plan requires Low Impact Urban Design Zoning of Source Area	CCC Community Local business Developer	Ongoing
					The growth of Belfast poses a threat to Ngāi Tahu's use of the waterway and the resources they provide. Enhance Ngāi Tahu identity and relationships with Smacks Creek.	Develop partnership with Te Ngāi Tūāhuriri Rūnanga for: future restoration projects to enhance the mauri of the river and aquatic habitats and to provide resources for cultural practices, planting of indigenous vegetation along riparian margins (including mahinga kai species), establishment of appropriate esplanade reserves and/or mahinga kai reserves where feasible, establishment of appropriate water quality standards, recognition to be given to Ngāi Tahu and relationships in the area, and use of appropriate names. .	Partnership and consultation with Te Ngāi Tūāhuriri Rūnanga State of Takiwā Monitoring Esplanade Reserves Riparian margins & Planted	CCC Ngāi Tahu	Ongoing

							Setbacks		
					The location of infrastructure and development may have negative effects on ground water flows in the area.	Carefully manage infrastructure placement to reduce the effects on ground water flows.	Zoning Stormwater Treatment & Detention areas	CCC	Ongoing
					Development and associated excavation in the Belfast area may result in increasing inflows of silt and contaminated surface water runoff and the loss of riparian vegetation.	Avoid and mitigate effects of silt runoff and reduced water quality from loss of riparian vegetation, increasing urbanisation and horticultural activity.	Esplanade reserve Riparian margins & Planted setbacks Stormwater Treatment & Detention areas	CCC Community Local business Developer	Ongoing
						Reduce the amount of waste, sediment and contaminated surface water runoff entering culturally significant waterways.	Esplanade reserve Landscaped setbacks	CCC Community Local business Developer	Ongoing
8	Kaputone Stream or Kā Pūatahi	A spring-fed stream that is part of the Styx/Ōtūkaikino catchment. This was an important mahinga kai area. The mauri and ecological health of this waterway is of concern to Ngāi Tahu. The traditional Māori name for this waterway is Kā Pūtahi.	2	Some protection under the City Plan Protection of water quality and quantity by ECan under the PNRRP and Water Quality Standards CCC Global Consent	The past and current activities of the Belfast freezing works has caused significant contamination of the Kaputone Stream.	Reduce and manage contaminated runoff associated with the freezing works.	Contain run-off onsite/Remediate Site Esplanade reserves Riparian margins & Planted setbacks	Landowner CCC Local business	N/A
					Urban growth and development may encroach on the margins of the Kaputone/Kā Pūatahi, threatening water quality and flow. --- The Growth of Belfast poses a threat to Ngāi Tahu's use of the waterway and the resources is provides. Enhance Ngāi Tahu identity and relationships with Kaputone/ Kā Pūatahi	Protect waterways and their margins from modification, reductions in water flow, changing land use and contamination. Create an esplanade reserve along stream. Ensure indigenous vegetation along riparian margins. On-site stormwater collection & treatment Protect spring source area from development. Separate stormwater discharges from spring source area. --- Develop partnership with Te Ngāi Tūāhuriri Rūnanga for: future restoration projects to enhance aquatic habitats and to provide resources for cultural practices, planting of indigenous vegetation along riparian margins, including mahinga kai species, establishment of appropriate esplanade reserves and/or mahinga kai reserves where feasible, establishment of appropriate water quality standards, recognition to be given to Ngāi Tahu identity and relationships in the area, and use of appropriate names.	Esplanade reserves Styx ICMP & Quality Standards Stormwater Treatment & Detention areas Development Contributions Riparian Margins & Planted Setbacks District Plan requires Low Impact Urban Design Zoning of Source Area --- Partnership and consultation with Rūnanga State of Takiwā Monitoring	CCC	See Natural Values Table #3
					The Northern Arterial motorway will cross the Kaputone Stream in a number of location and may have a possible negative impact in terms of water quality.	Protect Kaputone Stream/Kā Pūtahi in areas where it will be crossed by the northern arterial designation.	NZTA Management Plan	CCC	N/A
					The current name of the waterway is not correct.	Consult with Te Ngāi Tūāhuriri Rūnanga on preference for name to be used, and use that name.	Planning & Design documents,	CCC Ngāi Tahu	$

							signage and interpretation		
9	Otūkaikino /The South Branch of the Waimakariri River	This waterway was traditionally used by tangata whenua for the preparation of their dead before burial (Ōtūkaikino pool). The quality of this waterway is of concern to Ngāi Tahu.	2	Some protection under the City Plan Protection of water quality and quantity by ECan under the PNRRP and Water Quality Standards CCC Global Consent	There is a highly significant cultural site associated with Ōtūkaikino pool, and population growth and urban development may increase levels of contamination or lead to inappropriate use of the pool.	Avoid development in the vicinity of Ōtūkaikino pool to address Te Ngāi Tūāhuriri Rūnanga's concerns.	Zoning around pool	CCC	N/A
						Manage recreational use of Ōtūkaikino pool in consultation with Te Ngāi Tūāhuriri Rūnanga.	Signage and interpretation Education	CCC Ngāi Tahu	$
						Create an esplanade reserve with a minimum width of 20 metres along stream. Plant indigenous vegetation along riparian margins, including mahinga kai species.	Esplanade reserves Reserve contributions Land purchase	CCC	Variable
10	Waipuna/ Natural Springs	There area large number of springs in the area bounded by Belfast Rd, Crawford Rd, Radcliffe Rd and Kaputone Creek. These contribute surface water to the system of drains in this area. All waipuna are of high significance to Ngāi Tahu...	2	Some protection under the City Plan Protection of water quality and quantity by ECan under the PNRRP CCC Global Consent	Urban growth and development may threaten the natural spring within the Belfast area, and loss of flow may in turn contribute to base flow depletion in local streams and rivers. --- Enhance Ngāi Tahu identity and relationships with Waipuna	Protect spring source areas from development. Separate stormwater discharges from spring source areas. On-site stormwater collection & treatment.	Zoning of Source Areas Stormwater Scheme Design & Retrofitting Esplanade Reserves	CCC	N/A
						Monitor land use developments that may penetrate the impermeable stratum, and affect the quantity of water that these springs feed into the drainage system.	Environmental monitoring	CCC	Ongoing
						Monitor and restrict land uses that are likely to cause contamination of the high ground water levels in this area. --- Develop partnership with Te Ngāi Tūāhuriri Rūnanga for: future restoration projects for mahinga kai and spiritual practices at important spring source areas, planting of indigenous vegetation along riparian margins and establishment of appropriate esplanade reserves and/or mahinga kai reserves.	Environmental monitoring --- Partnership and collaboration with Rūnanga State of Takiwā Monitoring	CCC CCC Ngāi Tahu	Ongoing
11	Silent file 015	This silent file area is located in East Belfast. It is referred to as the Ōtūkaikino urupa (Te Wakatau Kaupapa), associated with the waters of the Ōtūkaikino, which were traditionally used for embalming.	1			Consult with Te NgāiTūāhuriri Rūnanga to determine how to avoid adverse effects from land use and development on culturally significant sites within the silent file 015 area.	Resource Consents Consultation with Rūnanga	CCC Developers Ngāi Tahu	N/A

5.7 Tangata Whenua Values Map



Landscape Character, Amenity and Urban Design Values

6.1 Introduction

This section of the Greenprint addresses the landscape character and visual amenity of the Belfast area. The landscape reflects the combination of traits that distinguish a particular area of land from its surroundings and is determined by the interrelationships of three components of land form, land cover and land use. Landform refers to the geology, topography and natural processes, such as erosion, hydrology and weathering. Land cover includes vegetation and water bodies, and reflects the biological processes such as plant succession and soil formation. Land use reflects cultural and social processes such as farming, tourism and transport needs, and can include spiritual and historical associations that give added meaning to places. The information in this section of the Greenprint comes from two background reports prepared for the Christchurch City Council, including the Belfast Area Plan Landscape Assessment (Craig & Lewthwaite, 2006) and the Belfast Area Plan Urban Design Study (Reeves, 2006). These reports should be consulted for a more in-depth analysis of the landscape values in Belfast and are referenced in full at the end of this document. The issues and priorities outlined in this section of the Greenprint refer predominantly to landscape, amenity and design; however, there is also significant crossover with other areas, such as planning, capital works, ecology and stormwater engineering.

The Belfast area is undergoing significant urban growth and landscape transition. Population growth has prompted an increase in substantial residential and retail developments, which have altered the way that Belfast looks and feels. New arterial roads to the east and north of Belfast will further change the character of the area once they are commissioned, including potential reductions in traffic flows through the township. As Belfast is projected to continue growing in the coming years, it is important to identify, protect and enhance the features of the natural and built environment that contribute to residents' sense of place and the traditional character of the suburb, including rural and gateway features, and maintaining a distinctive urban/rural edge. The ability to manage landscape change will be one of the most significant issues as Belfast becomes increasingly urbanised.

The Christchurch City Plan has objectives for the maintenance, enhancement and promotion of form and amenity across the city. The LTCCP also provides for landscape and amenity values through targets associated with city development and parks, open spaces and waterways. Most of the LTCCP targets relate to improving community perceptions of the 'look' and 'feel' of Christchurch.

6.2 Landscape values and related values

6.2.1 Land form

Belfast is located on the Waimakariri outwash plain, and the landscape is the product of alluvial processes, which have resulted from the action of the Waimakariri River and its tributaries. Artificial river control measures, such as stop banks, attest to the ongoing alluvial activity. The soils in Belfast are mainly silty loams, which have resulted from flood deposition. Old river channels are also evident in the soil structure, where a mixture of gravel and silt predominate. The landform in Belfast is essentially flat and is characterised by wide river terraces, which have been created by the action of major waterways over thousands of years. As a relatively subtle landform, Belfast's river terraces have succumbed to urban and rural land use regimes where building, land cultivation, roads and drainage have significantly modified their shape and appearance.

6.2.2 Land cover

Early maps of Belfast indicate the presence of shrub, grass and wetlands throughout the area and a wide variety of native species, such as Kowhai, Manuka, Cabbage tree, Flax, Tussock, Raupo and Sedge. Since European settlement, however, exotic and commercial land cover, such as pasture, shelterbelts, forest plantations, orchards and market gardens, have replaced much of the native vegetation. A number of exotic trees have heritage protection and are listed in the Christchurch City Plan. In recent times, many indigenous plants have been reintroduced through conservation initiatives, particularly around rivers and wetland areas. Plantings have also become more common in new residential developments and along major transport corridors, such as Main North Road.

6.2.3 Land use

Land use activities in Belfast have not changed substantially since the township was established, although the scale of activity has increased significantly. Residential, industrial, commercial, recreational, transport and rural activity has existed in the township since European settlement, and pastoral farming and horticulture remain the dominant land use types in the area. Belfast has also retained its characteristic as the northern gateway for Christchurch, which acts as a main entry and exit point for the city. While land use activities have remained more or less the same over time, a number of new land uses have also emerged in the area. These include major tourist and residential complexes, such as Clearwater Resort, and a number of new conservation areas. One of the main challenges for the Belfast Area Plan will be to integrate the many and varied land uses in a manner that maintains and enhances some of the distinctive features that characterise the landscape character of Belfast.

6.2.4 Rural/urban boundary

Belfast appears as an urban peninsula jutting into a rural setting and has a long rural/urban boundary in relation to its urban area. The major waterways that cross Belfast, particularly the Styx and Waimakariri Rivers, act as natural boundaries for the township and reinforce the area's distinction from the rest of Christchurch. There is a relatively sharp contrast between the urban and rural areas in Belfast due to a lack of lifestyle sections on the outskirts of the township, which creates a sharp dividing line between rural and urban Belfast. Increasing population growth in the area has and will continue to place pressure on the surrounding rural area. As the area develops, the interface between the rural and the urban will merit a high degree of landscape management and protection. Care will need to be taken to ensure that Greenfield developments do not compromise the fundamental character of Belfast. The implementation of the Urban Development Strategy will help to ensure that urban growth is well managed and reasonably contained within the Belfast area.

6.2.5 Urban design

Belfast has many of the characteristics of a small town and is recognised as a place separate from Christchurch with its own identity. The design of the area must reflect and enhance the sense of identity. Significant features of Belfast that need to be reflected in design include the following:

- The northern gateway;
- The rural village;
- The interface between the rural and urban land uses;
- Strong community focal points, such as Sheldon Park;
- The mixing of 'old' and 'new' Belfast;
- Industrial land and heritage;
- The dividing lines of Main North Road and the railway corridor.

In addition to reflecting and enhancing existing features, design in Belfast also needs to incorporate contemporary principles such as Crime Prevention Through Environmental Design (CPTED) and Low impact urban design and development (LIUDD), which aim to achieve wider environmental and social objectives through well-planned, high-quality design.

6.2.6 Rural land

Over 50 percent of the Belfast area is comprised of rural land, which surrounds the township to the west, north and east. Predominant rural land uses in the Belfast area include pastoral farming and horticulture. There are also a number of industrial and conservation land uses associated with the rural landscape. Most of the rural land in Belfast, as is typical throughout rural New Zealand, is divided into square and rectilinear allotments that are typically demarcated by linear fence lines and shelterbelts, which help to create an impression of green 'walls' and 'floors'. As above, a major issue for Belfast is the opportunity cost associated with the potential loss of rural land to foster urban development. In the Belfast area, there is no real constraint to further rezoning of rural land to urban apart from the flood hazard posed by the Waimakariri River, existing conservation areas and possibly the aircraft noise contours from activities at the Christchurch International Airport. Any rezoning of rural land will need to be carefully managed and accompanied by appropriate provisions to ensure that while the rural character will be lost, amenity values will remain high, and where possible distinctive landscape features, such as mature trees and shelter belts are incorporated within the proposed subdivision package to provide a high degree of urban design.

6.2.7 Natural character and amenity

Parks and reserves, waterways and wetlands, and stormwater treatment systems provide significant natural character and visual amenity for the Belfast area. There are a number of large parks and reserves in and around Belfast, which help to define the boundary of the township, enhance amenity and contribute to the local identity. Prominent examples include Styx Mill Reserve, Otukaikino Reserve and Sheldon Park. The waterways and wetlands of Belfast are also a salient natural feature of the area and some of these are the focus of significant naturalisation and replanting initiatives. Important waterways in Belfast include the Styx River, and the southern branch of the Waimakariri River. Modern stormwater treatment systems, such as swales, detention and soakage basins, have been incorporated into some of the new developments in Belfast and along main transport corridors. As well as improving the management of stormwater, they also contribute to the landscape character and amenity of the area by incorporating native plantings and the provision of open space. To protect Belfast's natural character, significant natural areas, such as waterways and conservation reserves, will need to be buffered from urban development.

6.2.6 Urban land

The urban areas of Belfast contain a range of land uses, although they are dominated by residential housing. Most houses are modestly scaled, detached and variable in their design and appearance. Newer subdivisions display a greater variety of housing density, style and size than many of the older areas, and there is growing trend in Belfast towards increasing residential density and a smaller scale of building and design. Older areas generally have a lower amenity value related to the age of the housing stock and public infrastructure, such as overhead power and telephone cables and traditional drainage systems. By contrast, newer residential and business areas have a high level of amenity that is associated with modern architecture, buried power and telephone cables, increased street planting and integrated reserve and stormwater swales and detention areas. Another major feature of Belfast's urban area is the roads, in particular Main North and Johns roads, which are dominant in terms of their size and traffic flows. These roads contribute significantly to the identity of Belfast as the northern entry and exit point for Christchurch. The current gateway function of Belfast will diminish, however, if the proposed northern arterial and western bypass routes are constructed. The upside of the road diversions is that the township will experience a significant improvement in amenity due to less traffic.

6.3 Key Issues

- Protecting, maintaining and enhancing landscape features and processes;
- Maintaining a distinctive identity for Belfast during urban development;
- Maintaining and enhancing legibility and coherence;
- Integrating new developments with existing urban areas;
- Mitigating the divisive effects of main transport corridors on the community;
- Protecting and enhancing the distinctive natural features of Belfast;
- Protecting and enhancing Belfast's distinct rural/urban boundary;
- Managing the interface between different land uses;
- Creating distinctive gateway and roadway treatments;
- Defining the extent of urban growth in Belfast;
- Protecting the rural character and outlook of Belfast;
- Protecting and enhancing the waterways and wetlands of Belfast as unique landscapes;
- Enhancing the streetscape in older residential areas and at the entry and exit points to the town;
- Enhancing the amenity of residential, business and industrial land;
- Creating an integrated network of pedestrian, cycleway and ecological linkages;
- Encouraging business and industry to enhance street- and zone-boundary amenity;
- Regenerating older living and business areas of Belfast;
- Employing contemporary design principles in new developments, such as CPTED and LIUDD;
- Ensuring that new developments do not adversely affect existing natural and manmade features.

6.4 Landscape Vision

To retain Belfast's landscape character at the interface between its rural/urban boundary, and to achieve a high level of visual amenity and natural character as the township develops.

6.5 Significant landscapes and amenity areas

There are a number of significant landscapes in Belfast that add to the amenity and identity of the area. Many of these areas are sensitive to urban development and land use change and require high levels of maintenance and protection.

Map number	Site name/location	Description	Perceived value 1 – High 5 – Low	Statutory protection	Issues	Recommended actions	Preferred mechanism(s)	Responsibility	Approximate costs
1	Rural zones	The majority of the land area within Belfast is rural land, which provides a high level of amenity for Belfast residents and offers some protection for existing natural features.	N/A	None: subject to rezoning and land use change	Urban development and population growth poses a threat to the landscape character of existing rural land in the Belfast area.	Protect rural areas from inappropriate land use, development and subdivision.	Zoning	CCC	Ongoing
						Restrict Greenfield development in rural areas that serve an important amenity or boundary defining function for Belfast.	Structure plans	CCC	Ongoing
						Ensure that rural open space is retained in accordance with the zone standard.	Zoning	CCC	Ongoing
2	Rural/urban Boundary	Belfast has an abrupt and extensive rural/urban boundary that surrounds the majority of the residential parts of the township. This interface gives Belfast the characteristic of being a rural town within the bounds of the city.	1	None: subject to rezoning and land use change	As Belfast grows there will be pressure to extend residential development to the periphery of the suburb. This will threaten the existing rural/urban boundary, which helps to define Belfast and create a degree of separation from the rest of Christchurch. There is, therefore, a pressing need to consolidate the boundary where possible.	Identify specific interface issues.	Research Area Plan Process	CCC	$
						Enhance the amenity of the rural/urban boundary.	Council works and services	CCC	Ongoing
						Enhance natural boundaries, such as waterways.	Esplanade strips and reserves Council works and services	CCC	Ongoing
						Provide pedestrian and cycle routes along the rural/urban boundary.	Esplanade strips and reserves Land acquisition Covenants NZ Transport Agency	CCC	Variable
						Utilise the existing rural/urban boundary to define the extent of zones.	Zoning Strategic planning	CCC	Ongoing
						Ensure that the rural urban boundary is safe and has a high level of visibility.	CPTED education and planning	CCC Developers	N/A
3	Industrial/urban interface	The main interface between industrial and residential land uses is generally west to the east across the railway line, although there are some industrial buildings immediately adjacent to residential properties.	2	None: subject to rezoning and land use change	The growth and development of Belfast is likely to bring residential and industrial development closer together. Existing, large-scale industrial developments, such as the freezing works are likely to be scaled down, but there will be ongoing development of light industrial activities. At the areas of interface between residential and industrial developments, there are likely to be issues associated with a lack of visual amenity.	Identity specific interface issues.	Research Area Plan Process	CCC	$
						Use plantings to create screens between industrial and residential land uses.	Planting Education Easements' Setback requirements	Landowner	$
						Employ appropriate building setbacks and design to reduce the negative effects of industrial activity on residential properties.	Building setbacks City Plan Rules Design guides Easements	CCC Developers	Ongoing
4	Urban/open space and waterway interface	There are a number of significant open space areas and waterways in the Belfast area, which enhance the local landscape character and amenity. There are locations throughout Belfast where urban areas are located adjacent to such open space areas.	3	None: subject to rezoning and land use change	In the areas where open spaces and waterways adjoin residential developments there may be issues associated with a lack of integration between the two land uses and potential negative environmental impacts associated with runoff from developments entering waterways.	Identify specific interface issues.	Research Area Plan Process	CCC	$
						Ensure that houses front onto open space areas and waterways.	Design guides CPTED education Subdivision process	CCC Developers	Ongoing
						Ensure that smaller open space areas have long road frontages.	Design guides CPTED	CCC Developers	Ongoing

							education Subdivision process		
						Create a green buffer around the most significant open space areas and waterways.	Land purchase Esplanade reserve/strip	CCC	$$$ - $$$$$
						Use planted screening and low building heights at the interface between residential areas and significant open spaces.	Building setbacks City Plan Rules Planting	CCC Developers	Ongoing
5	Urban/ transport corridor interface	A number of major transportation corridors run through urban Belfast, including Main North Road, Johns Road, the Railway line, the proposed Northern arterial and Western bypass roads.	3	None: subject to rezoning and land use change	There are a number of issues associated with the interface between urban areas and transportation corridors. These include residential developments facing away from the road and negative visual and aural impacts of the northern arterial and the railway line.	Identify specific interface issues.	Research Area Plan Process	CCC	$
						Use visual and aural screening techniques to protect housing from the negative effects of being located adjacent to main transportation corridors.	Planting Mounding Double glazing City Plan Rules NZ Transport Agency Management	CCC Developers	Ongoing
						Create recreational or ecological corridors alongside major transport routes as a buffer to surrounding land uses.	Land purchase Partnerships with NZ Transport Agency	CCC NZ Transport Agency	$$$ - $$$$$
6	New living zones	New living zones generally have a high level of amenity value due to the under grounding of power and telephone cables, landscaping and integrated storm water management. New living zones also tend to have a mixture of housing densities, providing a more diverse and balanced community.	3	None: subject to rezoning and land use change	The new living zones proposed for Belfast create challenges to ensure that residential areas have a high level of visual amenity, ensuring good integration with surrounding natural values, and ensuring that development does not threaten the coherence of the Belfast community.	Continue to implement high amenity design initiatives, such as low impact urban design.	Structure plans Covenants Design guides	CCC Developers	Ongoing
						Encourage all future subdivision to integrate well with natural features.	Structure plans Area Plan Process Covenants Design guides	CCC Developers	Ongoing
						Create a framework for development in new growth areas.	Structure Plans Area Plan Process	CCC	Ongoing
						Constrain further outward growth in the East and West of Belfast.	Zoning	CCC	Ongoing
						Research how new developments have affected the local community and environment.	Research and monitoring	CCC	Ongoing
7	New Business zones	The new business zones in Belfast tend to have a relatively high level of amenity due to plantings, appropriate building design, integrated pedestrian circulation, stormwater management and roadways.	3	None: subject to rezoning and land use change	New business zones in Belfast may create issues for the area if they are poorly designed and if they have negative environmental impacts, such as generating contamination that enters waterways.	Continue to implement high amenity design initiatives, such as low impact urban design techniques.	Structure plans Area Plan Process Covenants Design guides	CCC	Ongoing
						Research how new developments have affected local community and environment.	Research and monitoring	CCC	$
8	Waterways	Waterways are distinctive features of the Belfast landscape, which have shaped the geomorphology of the area. They help to define the rural/urban boundary, contrast with the grid-like layout of streets and farmland, and are associated with the presence of native and exotic riparian plantings. Stop banks along waterways are also a	1	Some protection under the City Plan	The waterways of Belfast are among the most significant landscape features in the area. As Belfast continues to grow and develop the main issues will be ensuring that waterways and their corridors include the following: • Dealing with the potential negative environmental impacts of land use change. • Overcoming possible threats to public access as development progresses in areas adjacent to waterways. • Addressing potential loss of visual amenity	Protect waterways and the waterway corridor from the negative impacts of land use change and development.	Esplanade reserves/strips Zoning Land purchase Esplanade designations Buildings setbacks	CCC Developers	$$$ - $$$$$
						Undertake landscape enhancement around waterways, where appropriate.	Council works and services	CCC	$$$ - $$$$$
						Identify landscape attributes associated with waterways and wetlands that could be lost when	Research Area Plan	CCC Developers	Ongoing

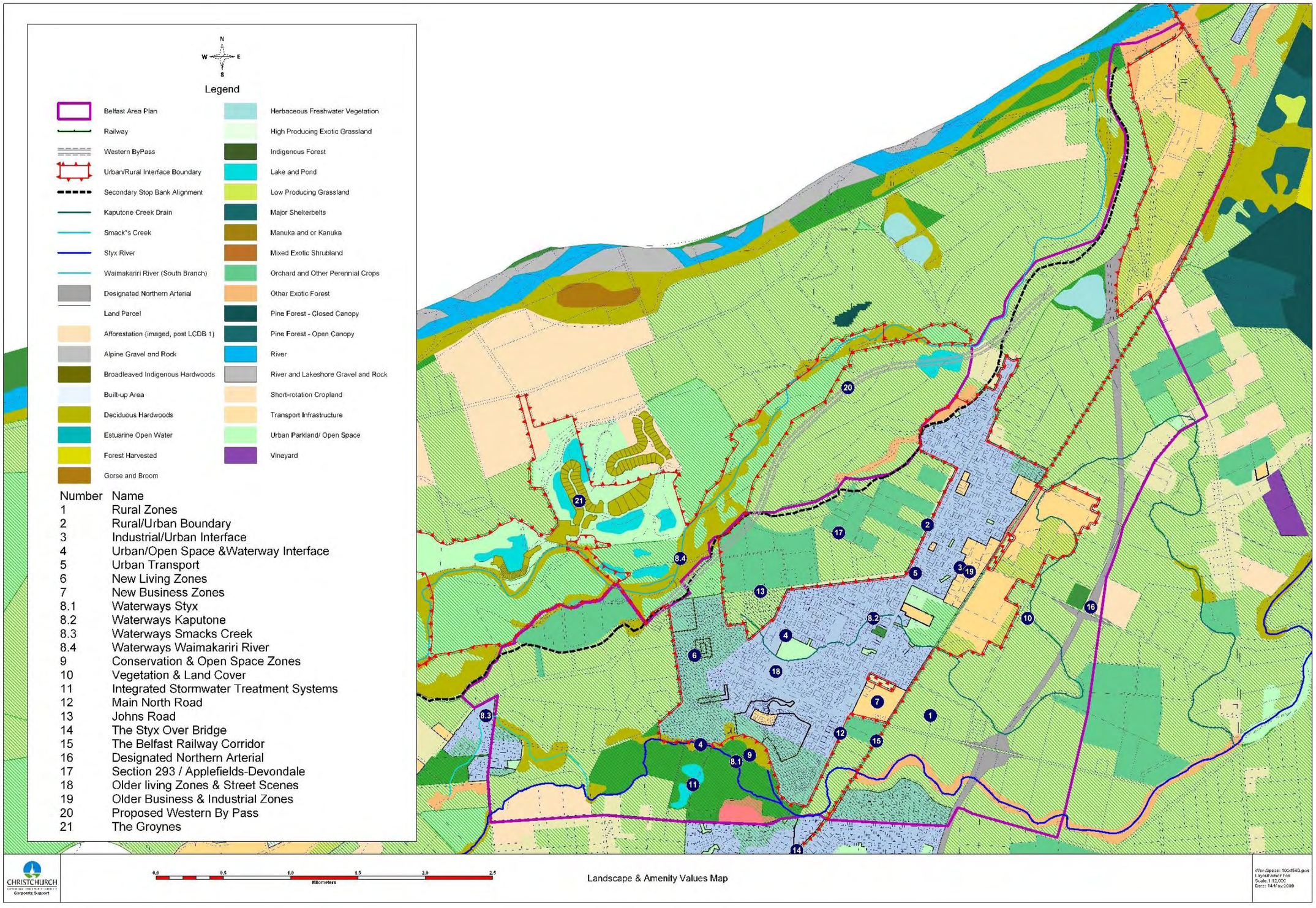
		prominent landscape feature, which add to the identity of the area and highlight the presence of the waterways.			along riparian corridors as a result of urban development. • Providing stormwater management for the area in a manner that does not negatively impact upon the quality or base flows of existing waterways. • Dealing with the threats to native flora and fauna posed by pest species. • Reflecting the heritage of the landscape. • Improving amenity in areas where the riparian margin is degraded. • Improving walking linkages along and between waterways. • Utilise waterways for the purposes of defining the boundaries of Belfast. • Reflecting the importance of waterways in new developments.	the adjacent land is no longer rural.	Process Structure Plans		
						Create public access ways and recreational nodes adjacent to waterways.	Land purchase Esplanade reserves and strips	CCC	$$$ - $$$$$
						Increase the levels of protection for floodplains.	Area Plan Process Integrated Catchment Management Plans Waimakariri River Plan Consent	CCC ECan	$$$
						Improve riparian and storm water drainage management.	Area Plan Process Integrated Catchment Management Plans Waimakariri River Plan Consent	CCC	$$$
						Increase predator control around waterways.	Council works and services	CCC	Variable
						Add interpretation and promotion of major waterways.	Interpretation panels	CCC	$
						Undertake riparian planting and restoration to improve the amenity value of major waterways.	Council works and services	CCC	$$$ - $$$$$
						Provide links between waterways.	Land acquisition	CCC	$$$ - $$$$$
						Use waterways as a basis for promoting and defining Belfast.	Signage and interpretation	CCC	$
						Develop walkways alongside waterways.	Esplanade strip/reserve	CCC	$$$ - $$$$$
						Incorporate local waterways into features of new developments.	Covenants Structure Plans	CCC Developers	Ongoing
9	Conservation and open space zones	Conservation and open space areas add to the landscape character and enhance the amenity value of Belfast. They also help to define the boundaries of the suburb and enhance the gateway function of the area.	1	Protection under the Reserves Act and City Plan	There is a lack of viable habitat areas in Belfast, and those that remain may be threatened by urban development and an increased human presence. Additionally, there is a lack of visual amenity associated with many reserves and park structures.	Develop ecologically viable corridors and habitats in order to compensate for lost habitat associated with rural land.	Land purchase	CCC	$$$ - $$$$$
						Extend existing open space and conservation areas, particularly Otukaikino Reserve.	Land purchase	CCC DOC	$$$$$
						Improve buildings associated with parks and reserves.	Council works and services	CCC	Ongoing
						Create further parks or reserves where the opportunity arises.	Land purchase	CCC	$$$$$
						Develop the banks of the Waimakariri River, near the Otukaikino outlet into a recreation and conservation area.	Assist ECan in managing existing Esplanade reserve and strip	CCC ECan	Ongoing
						Investigate opening up Sheldon Park to make it more visible from the road and adjacent residential areas.	Research Reserve Management Plan	CCC	$
10	Vegetation and land cover	There are a number of notable and protected trees in Belfast, which add significantly to the landscape character and	3	Protection under the City Plan for listed	Urban development and redevelopment of land at higher densities may pose a threat to significant but as yet unlisted trees.	Maintain and enhance the setting for protected trees.	Council works and services	CCC	Ongoing
						Investigate the possibility of obtaining protection for shelterbelts.	Research Area Plan	CCC Developers	$

		amenity of the area. There are also many significant but unlisted trees, which will require protection as Belfast develops. Shelterbelts, in particular, provide protection to stock and crops, but are also a significant landscape feature. Recently, a number of areas have been replanted with native vegetation, which also adds significantly to the landscape character and amenity of Belfast.		trees only			Process Structure Plans		
						Identify and protect significant, but unlisted trees.	Research	CCC	$
11	Integrated stormwater treatment systems	Modern stormwater management techniques, such as swales and detention areas, have added significantly to the landscape character and amenity of Belfast's new developments.	2	No Protection	Many of the older stormwater networks that are common in Belfast are highly utilitarian and are likely to require significant retrofitting as the population increases in the coming years.	Retrofit older drainage systems with integrated stormwater management alternatives.	Council works and services Integrated Catchment Management Plan	CCC	Variable
						Ensure that all new developments employ integrated stormwater management systems.	Structure Plans Integrated Catchment Management Plans Waimakariri River Plan	CCC ECan	Ongoing
12	Main north road	This is the major transportation corridor running from South to North through Belfast, which acts as the main northern entry and exit point for Christchurch.	3	No protection	Many stretches of Main North Road have a low level of visual amenity. Additionally, as the road a main route out of Christchurch, there are limited opportunities to promote local businesses and to market the area as a destination. There is also a lack of recognition of the importance of the road for Belfast's identity. There are also difficulties for Pedestrians wishing to cross Main North Road.	Enhance main north road with further planting and landscaping, particularly at the entry and exit points to Belfast.	Council works and services	CCC	Variable
						Promote Main North Road as an area for new businesses once the road is downgraded due to the development of the northern arterial.	Zoning Education	CCC	Ongoing
						Provide recognition for the importance of Main North Road to Belfast's identity.	Signage and interpretation	CCC	Variable
						Improve safety for pedestrians and cyclists who want to cross from one side of Belfast to the other.	Traffic calming measures	CCC NZ Transport Agency	Variable
13	Johns Road	This is the second major transportation corridor running through Belfast, which reinforces the gateway function of the area.	4	No protection	Many stretches of John's Road have a lack of visual amenity, and there is a lack of recognition for the role that John's Road has played in terms of Belfast's identity.	Enhance Johns Road with further planting and landscaping, particularly at the entry and exit points to Belfast.	Council works and services	CCC	Variable
						Provide recognition for the importance of Johns Road to Belfast's identity.	Signage and interpretation	CCC	Variable
14	The Styx Over bridge	The Styx Over bridge is the southern entry and exit point for Belfast. It is a significant landscape feature due to its elevation and history in the area.	2	No protection	The bridge is a significant southern gateway to Belfast, yet there is a lack of recognition or design that emphasises this.	Enhance the Styx over bridge as a key gateway entry point.	Council works and services Signage and interpretation	CCC	$$$$$
15	The Belfast railway corridor	The railway line runs from south to north through the centre of Belfast and divides the eastern and western parts of the area.	3	No protection	There is currently a lack of pedestrian access across and along the railway corridor.	Incorporate pedestrian and cycle access with the rail corridor and link to waterway corridors, open spaces and reserves.	Land purchase	CCC	$$$$$
						Improve access for pedestrians and cyclists who want to cross the railway line.	Land purchase	CCC NZ Transport Agency	$$$$$
16	Proposed northern arterial	A proposed two-lane arterial road to the east of Belfast from the northern motorway to QEII drive. The development of this major	2	N/A	The northern arterial motorway may have negative impacts on the landscape values of surrounding areas. There is also potential for a lack of integration of pedestrian and public transportation.	Mitigate the effects of the northern arterial on the size and shape of adjacent land parcels.	Designation	CCC NZ Transport Agency	N/A
						Ensure that the northern arterial is well landscaped and has a high level of amenity, particularly at the entry and exit points to Belfast.	Council works and services	CCC NZ Transport Agency	N/A

		road should proceed in a manner that does not negatively affect the landscape character and amenity of Belfast.				Ensure that land use planning in the areas adjacent to the Northern Arterial proceeds in a comprehensive and connected manner.	Structure plans Designation	CCC NZ Transport Agency	N/A
						Provide adequate access for pedestrians and cyclists to cross the Northern Arterial.	Designation	CCC NZ Transport Agency	Variable
						Develop 'park and ride' facilities where appropriate.	Land acquisition	CCC NZ Transport Agency Developers	Variable
						Ensure that the Northern Arterial does not disrupt the amenity of Belfast Cemetery.	Designation	CCC NZ Transport Agency	N/A
17	Section 293 land (Applefields/Devondale site)	A section of 93 hectares in the north-west of Belfast that has been earmarked for potential residential development. This is potentially one of the largest new developments in Belfast. Considering that it is associated with the rezoning of large areas of rural land, the development will need to be of a high quality to offset the loss of rural amenity. Of note, there is a natural ridgeline along the northern margins of the site, which may be the remnant of an old river terrace. There are also two natural sinkholes in the east and west of the site, which are represented on the black map. An ephemeral stream has also been located in the south east of the site.	2	N/A	There is potential for this large land area to develop in a manner that does not integrate well with the other parts of Belfast.	Encourage mixed use and intensive residential development.	Zoning Outline Development Plan City Plan Rules	CCC	Ongoing
						Ensure that this land is well integrated with the southern parts of Belfast.	Zoning Outline Development Plan City Plan Rules	CCC	Ongoing
						Develop recreational corridors through the site from north to south to encourage the movement of people through the site to the basins, wetlands and parks to the north.	Development / reserve contribution Land purchase Zoning	CCC	Ongoing
					It is important that any development of the site takes into account existing natural features and contributes to the enhancement of the environment in the area.	Ensure that the natural ridgeline, sinkholes and ephemeral stream are incorporated into the development in a manner that sustains these values.	Development / reserve contribution Land purchase Zoning City plan rules	CCC	Ongoing
18	Older living zones and street scenes	Older living zones in Belfast tend to have a lower level of amenity than many of the newer residential areas. This is largely due to poor quality street scenes associated with a lack of street trees and green space, old dish kerb and channel and overhead wiring. These areas are located in the North east of Belfast and are centred on Lagan, Swift and Darrochs Streets and the area between Belfast and Factory Roads.	4	Some protection for listed heritage buildings in the City Plan	The issues associated with the older living zones in Belfast are as follows: • There is a lack of high quality landscaping and urban design in older living zones. • There is a lack of integration between old and new living zones in Belfast.	Retrofit older living zones by under grounding cables and providing better storm water management.	Council works and services	CCC Developers	N/A
						Provide community facilities, which serve both the older and newer suburbs, such as a primary school, or shopping facilities to improve integration between old and new areas.	Provision of services and facilities	CCC Developers	Ongoing
						Enhance amenity with landscaping and where possible include the under grounding of services.	Council works and services	CCC Developers	Ongoing
						Where possible, enhance older residential area to better integrate with natural features.	Council works and services	CCC	Ongoing
						Increase the planting of street trees.	Council works and services	CCC	Ongoing
						Undertake kerb and channel upgrades.	Council works and services	CCC	Ongoing
						Increase the provision of street art in the older parts of Belfast.	Council works and services	CCC	Ongoing
						Upgrade lighting, including lighting of significant trees.	Council works and services	CCC	Ongoing
						Undertake carriageway narrowing.	Council works and services Designation	CCC NZ Transport Agency	Ongoing
						Provide sufficient open space and retrofit underutilised parks in older residential areas.	Land purchase Council works and services	CCC	Ongoing
						Rezone older residential areas to Living 2.	Zoning	CCC	Ongoing

							Area Plan Process		
19	Older business and industrial zones	Older business and industrial zones in Belfast have a lower level of amenity than many of the newer areas. This is due to a lack of landscaping and poorly designed building facades. The main industrial area is located in the North east of Belfast and is centred on the freezing works.	3	Some protection for listed buildings in the City Plan	Older business and industrial zones in Belfast have a low level of urban design and landscaping. Opportunities for redevelopment may also threaten the heritage values associated with older buildings.	Develop partnerships with local businesses and industry to improve the amenity of older sites.	Partnerships and consultation Site briefs	CCC Local business	$$
						Enhance amenity of industrial street frontages and other areas with appropriate landscaping.	City Plan setbacks	CCC Local business	Ongoing
						Rezone industrial land to Living 2.	Zoning Area Plan Process	CCC	N/A (Regular costs associated with a plan change)
						Ensure that any redevelopment of industrial areas, includes an assessment of the heritage value of buildings associated the property.	Heritage research Structure Plans	CCC	Refer to Heritage Table

6.6 Landscape and amenity values map



7. Open Space, recreation and community facilities

7.1 Introduction

Belfast has a wide range of open space, recreation and community resources, which contribute to the physical, social, environmental and cultural wellbeing of residents. Projected population growth, however, is likely to increase demand for such resources, and the Council has an important role in ensuring that open space, recreation and community facilities are provided to keep pace with urban growth and satisfy community needs. The Area Plan process provides an opportunity to enhance and develop the open space and recreation network in Belfast for the benefit of current and future residents. In the context of this report, recreation refers to any active or passive activity undertaken voluntarily during leisure time primarily for the purposes of pleasure, enjoyment and satisfaction (Johnston, Gregory, Pratt & Watts, 2002). Open space refers to areas of publicly or privately owned land or water to which the public has a level of free physical access (Christchurch City Council, 2008). This section of the Greenprint is informed by two background reports prepared for the Christchurch City Council: the Belfast Area Plan recreation and open space report (Keller et al., 2008) and the Belfast Area Plan community facilities report (Hozias, Bonis, Lopez & Thompson 2007). These reports should be consulted for a more in-depth analysis of the open space, recreation and community values in Belfast and are referenced in full at the end of this document.

Although demand for open space, recreation and community resources will be driven largely by population growth, changing social trends will also influence community engagement. Some of the important social trends and issues that are likely to affect the use and provision of community recreation resources include the following:

- A changing family structure and increasing work demands may lead to less time for organised pastimes, and a move towards more informal and spontaneous recreation activities;
- Increasing individualism in society may result in a move away from organised team sports to informal and independent activities, such as jogging and cycling;
- Low and decreasing levels of physical activity, particularly among young people, ethnic minorities and the poor, may lead to reduced use of open space and recreation facilities by some members of the public;
- Population ageing is likely to prompt a shift towards less strenuous and lower cost recreation activities, such as walking;
- The public has a high level of expectation regarding the quality and services provided by recreation and community facilities, which may lead to an increased cost of provision.

Over the last decade, the Christchurch City Council has consulted with the Belfast community and has identified the recreation and community service needs of residents as part of the background work associated with the development of the Belfast Area Plan. Some of the most significant community needs identified by Belfast residents include the following:

- Improved pedestrian and cycle links between open spaces and recreation facilities;
- Enhanced safety and accessibility of existing open spaces and recreational facilities;
- Additional provision of recreational facilities to serve Belfast's diverse community;
- Increased provision of open space areas for children; and
- The creation of a central community focal point associated with Sheldon Park.

In 2006, Belfast had a usually resident population of 7,641. Servicing this population is an open space network of approximately 130 ha. This relates to a relatively high level of service of 17ha of open space provision per 1,000 residents. Additionally, Belfast is flanked to the west by the Groynes, which provides access to an additional 93 ha of high-quality open space. Belfast's abundance of open space is largely the result of the close proximity of large regional parks and conservation land, such as Styx Mill and Otukaikino Reserve. There is, however, a much lower level of provision in relation to other forms of open space, such as sports parks.

Belfast has three main sports grounds: Sheldon Park (10.3ha), Ouruhia Reserve (9.2ha) and Northwood Park (2.9ha). Collectively, these provide 2.9ha of sports park in Belfast for every 1,000 residents. This is lower than the Christchurch average of 3.05ha per 1,000 residents. In order to provide an equitable quantity of sports park that is comparable with the level of provision in wider Christchurch, Belfast would require an additional 2.25ha in the short term. Additionally, there is also a lack of provision for popular team sports, such as soccer, which currently has no facilities within Belfast. If projected population growth (up to approximately 15,000 residents by 2026) is taken into account (based on sequencing associated with development option one and 2.6 persons per dwelling), a further 27.85ha of sports park would be required over the next 15 years to ensure equity with the rest of Christchurch (assuming that the current level of provision across Christchurch are maintained). Sheldon Park is the most significant of these sports parks due to its size and location. The local community has expressed a desire that this park become a hub of activity for local people, which would cater for sport and recreation needs as Belfast grows.

With the exception of sports park provision, Belfast is relatively well endowed with open space and in the coming years the main challenge for Council will be to ensure that open spaces are well linked, maintained to a high standard and support multiple values. There will also be significant opportunities to enhance local waterways through the development of open space corridors along riparian margins.

7.2 Recreation and open space values

7.2.1 Open space areas

Public open space contributes to the passive and active recreation needs of the community, enhances visual amenity, contributes to the garden city image of Christchurch and supports local biodiversity. Belfast currently has access to a range of open spaces areas, including local parks, sports parks, regional parks, riverbank reserves, cycle ways, walkways and waterways. The most significant open space areas in Belfast include Sheldon Park, Styx Mill Conservation Reserve and Otukaikino Reserve. There are also important open space areas located just outside the Belfast area, such as the Groynes Recreation Reserve, the Waimakariri River and Willowbank Wildlife Reserve. With the expected population growth in Belfast, there will be growing demand for open space resources. Figure 5 below shows the current pattern of open space accessibility within the Belfast area. Notable areas of deficiency include the areas north and east of Sheldon Primary School. These will need to be addressed as Belfast continues to grow. Planning solutions are required to ensure that there will be a network of attractive, varied and well-connected parks and reserves that contribute to the health and wellbeing of local residents, and the protection and enhancement of the natural environment. Within the City Plan, the Christchurch City Council has identified that it seeks to maintain a diversity of linked open space areas, and the LTCCP (2006-2016) identifies specific targets for service provision with regard to open space[3].

[3] The Christchurch City Council has an urban park standard of 4.7 hectares per 1,000 people. The regional park standard is 14 hectares per 1,000 people. Additionally, public open spaces should be provided within 400m of 90 percent of all residential households (Christchurch City Council, 2006).

7.2.2 Recreation and sport facilities

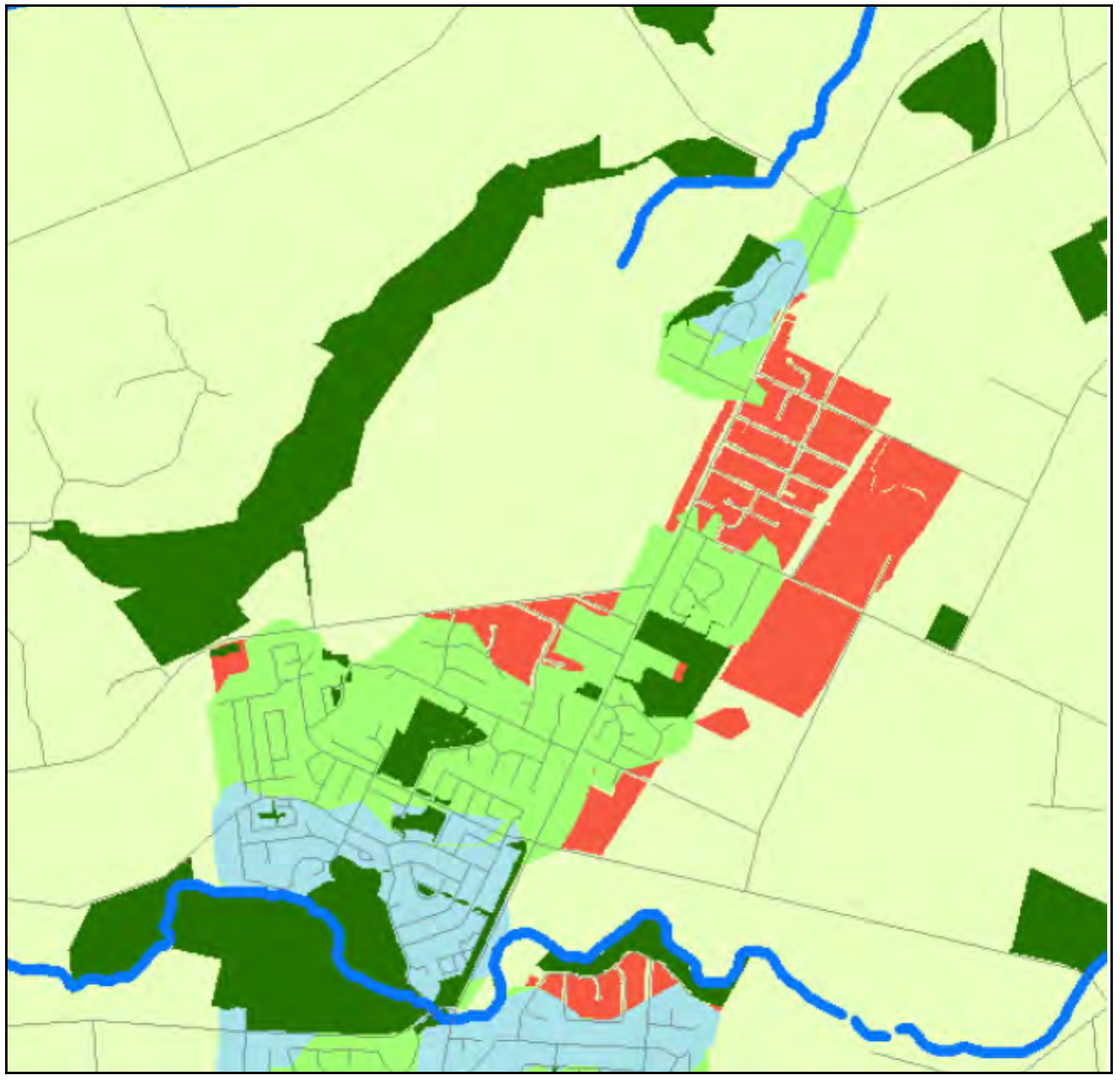
In addition to a network of open spaces, Belfast also has a range of recreational facilities that provide opportunities for people to participate in activities such as swimming, group exercise and organised sport. A number of important recreation facilities in Belfast are co-located with the main recreation node, Sheldon Park. These include a swimming pool (which whilst earmarked for closure in 2009, has been provided with the opportunity to remain viable as long as the infrastructure can be sustainably maintained), a boxing gym, netball facilities and rugby and softball clubs. There is also a small network of walkways and cycleways in Belfast, which provide recreation opportunities for local residents. Recreational facilities in Belfast are currently insufficient to meet demand, and a number of facilities are reaching the end of their operational life. There is a need for increased provision of recreation facilities, and the community has expressed a desire for a large, multipurpose facility that would cater for a wide variety of needs and bring the community together. In terms of recreation facilities, the Christchurch City Plan seeks to provide a range of recreational facilities to meet local needs, and the LTCCP sets standards for the provision of leisure centres and swimming pools[4].

7.2.3 Community facilities

As one of the older suburbs of Christchurch, Belfast has a well-developed network of community facilities. Important community facilities include places of worship, pre-school centres, schools, community halls and meeting places, police stations, medical clinics, voluntary and welfare services, social housing, visitors' centres, museums and libraries. Community facilities are vitally important as they assist in the delivery of social services, provide meeting places for local residents, provide a base of operations for community organisations, provide spaces for recreation and community activities and help to create a distinct sense of identity among residents. As Belfast grows, the Christchurch City Council must work closely with community groups and local agencies to ensure that facilities and services are provided in a manner that is equitable and responds to local demands. The Christchurch City Plan aims to provide accessible community facilities that meet local needs and provide opportunities for community and cultural development. The LTCCP also has a range of targets for the provision of community facilities[5].

[4] The Christchurch City Council aims to provide one multi-use leisure centre per 50,000 people, and 1 square metre of swimming pool space for every 105 people (Christchurch City Council, 2006).
[5] Christchurch City Council has targets for the provision of community facilities, including 3 library items per capita and 2,620 units of social housing stock.

Figure 5: Open space accessibility for the Belfast Area



7.3 Key Issues

- Improving accessibility to open space areas and community facilities and overcoming existing deficiencies and barriers;
- Improving connectivity and creating green linkages between existing and new open space areas;
- Enhancing the provision of walkways and cycle ways and integrating these with existing open spaces, waterways and transport corridors;
- Reinforcing the sense of isolated urban amenity that characterises Belfast;
- Providing additional open space, recreation and community facilities in a manner that is sufficient to cater for population growth;
- Developing a large, multipurpose recreation/community facility for Belfast;

- Undertaking consultation with local community, recreation and sports groups to determine the exact requirements and functionality of new facilities and reserves;
- Increasing the provision of open space areas, particularly in new residential developments;
- Providing open space, recreation and community resources specifically for increasing numbers of children and young people in the area;
- Providing recreation and community resources that cater specifically for the needs of an ageing population;
- Responding to increasing demand for educational centres and services;
- Developing a new library for the area as Belfast's population grows;
- Developing a strong sense of place and community within Belfast;
- Enhancing the integration between 'old' and 'new' Belfast.
- There is a lack of provision of sports parks and a lack of provision for popular sports, such as soccer.

7.4 Recreation and open space vision

To facilitate and provide the following as Belfast grows and develops:

- Accessible and interconnected open spaces;
- Diversity in the function, type and size of open spaces to meet local needs, including the provision of district and regional needs where appropriate; and
- A diversity of facilities and recreational opportunities that meet local needs and capitalise upon the environmental attributes of the area.

7.5 Significant open spaces and community facilities

Belfast has a wide range of existing open space areas, recreation and community facilities that contribute to the liveability of the area. As the population increases in the coming years, these resources will need to be protected from land use change and urbanisation, and new open spaces and community facilities will need to be developed to meet local needs. The table below summarises the most significant open space and community resources within Belfast.

Map Number	Site Name/Location	Description	Perceived value 1 – High 5 – Low	Statutory Protection	Issues	Recommended actions	Preferred mechanisms	Responsibility	Approximate costs
1	Local/neighbourhood parks	There are a number of small local/neighbourhood parks in Belfast, which provide an accessible recreation resource for residents.	1	Protected as an open space zones under the City plan	There is a lack of connectivity within the current greenspace network that is limiting the extent to which people can walk and cycle between areas of open space.	Ensure that small local/neighbourhood parks, both existing and new, are linked to each other and to community services by a network of walkways and cycle routes.	Land purchase	CCC	Variable
					As Belfast grows there will be an increasing need for small areas of open space that provide visual relief from urban development and provide recreational opportunities for local residents as well as providing connection within the wider green space network.	Increase the provision of small neighbourhood/local parks.	Land purchase	CCC	Variable
2	Sheldon Park	A 10-hectare park that provides a range of clubrooms and facilities including, Belfast Rugby Club, Belfast Touch Club, Belfast Netball Club, Belfast Bowling Club, Barry's Boxing Gym, Belfast Pool and Skateboard facilities.	1	Protected as an open space zone in the city plan	Urban growth, and particularly the projected growth in the number of families with children in the Belfast area, will increase demand for sports fields. Due to its size and location, Sheldon Park provides a community hub for Belfast, which may help to integrate the relatively segregated older and newer areas of Belfast. The main opportunities for extension of Sheldon Park are on the eastside of the railway line, which creates a significant constraint to the movement of people between areas of open space. Pending urban development of the land to the east of Sheldon Park currently may constrain potential extensions of the green network in this area. There is possible contamination in certain areas of land to the east of Sheldon Park that may constrain sports field and other forms of development.	Expand Sheldon Park by up to 7 hectares to the east, across the rail corridor.	Land purchase	CCC New Zealand Transport Agency	$$$$$
						Improve accessibility across Main North Road for those who wish to access Sheldon park.	Main North / Johns Road intersection design. Sheldon Park Management Plan under the Reserves Act	CCC New Zealand Transport Agency Local community	Variable
						Provide a pedestrian linkage across the rail corridor.	Infrastructure provision	CCC New Zealand Transport Agency On Track	Variable
						Create a pedestrian bridge across main north road to allow residents to better access the park.	Sheldon Park Management Plan under the Reserves Act	CCC Transit NZ	Variable
						Investigate the feasibility of linking facility development to Sheldon Park to provide a strong community focal point in Belfast.	Community consultation Sheldon Park Management Plan under the Reserves Act	CCC Community groups	$
						Increase the provision of sports facilities and leisure opportunities associated with Sheldon Park.	Sheldon Park Management Plan under the Reserves Act	CCC Sports clubs	$
						Enhance the visibility and surveillance associated with Sheldon Park.	Retrofitting according to CPTED principles	CCC	Ongoing
						Link Sheldon Park to other open space areas in the vicinity.	Land purchase	CCC	N/A (Low priority for land purchase)
3	Englefield Reserve	Located at 95 Englefield Road, this four-hectare park has a rugby field and a	4	Protected as an open space zone in the City	There is a lack of connectivity within the current greenspace network that is limiting the extent to which people can walk and cycle between areas of open space.	Link Englefield Reserve to other open space areas in the vicinity.	Land purchase	CCC	N/A (Low priority for land purchase)

		children's play structure.		Plan					
4	Northwood Park	This is a newly created sports park, which is a part of the Northwood development.	4	Protected as an open space zone in the City Plan	There is a lack of connectivity within the current greenspace network that is limiting the extent to which people can walk and cycle between areas of open space.	Link Northwood Park to other open space areas in the vicinity.	Land purchase	CCC	N/A (Low priority for land purchase)
5	Styx Mill Reserve	Styx Mill Reserve is a large conservation reserve, which provides significant recreational, cultural, ecological and other natural values.	1	Protected as a conservation zone in the City Plan	There is a lack of connectivity within the current greenspace network that is limiting the extent to which people can walk and cycle between areas of open space. The Styx River system is arguably a nationally significant riparian environment, which is capable of supporting significant natural and recreational values. However, more work is required to protect the land on the margins of this waterway.	Link the Styx Mill Reserve with other open space areas in the vicinity using local waterways.	Esplanade strip or reserve	CCC	Variable
						Create a chain of conservation reserves along the Kaputone and Styx Rivers.	Land purchase Esplanade strip or reserve	CCC	Variable
						Expand Styx Mill Reserve, where possible.	Land purchase	CCC	**$$$$$**
6	Otukaikino Reserve	Otukaikino Reserve is a conservation reserve, which provides significant recreational, cultural, ecological and other natural values.	2	Protected under the Reserves Act	There is a lack of connectivity within the current greenspace network that is limiting the extent to which people can walk and cycle between areas of open space.	Link Otukaikino Reserve with other open space areas in the vicinity, specifically the Groynes.	Land purchase	CCC	Variable
					Otukaikino Reserve is a significant conservation and recreation area within Belfast; however, more land is required to ensure that it remains viable as an ecological and recreational resource.	Protect the land south of the reserve to increase the size of the reserve and potentially enhance the naturalised walkway experience in this locality.	Land purchase	CCC DOC	**$$$$$**
7	Belfast oxidation ponds	The oxidation ponds are located in the north east of Belfast and provide and important utility role as well as being an increasingly important site for local wildlife.	4	CCC Owned. River Conservation Gazette on title.	The Belfast Oxidation Ponds are a significant habitat for local birdlife and as an area for walking, but it is threatened by changing land uses in the area. In particular, the proposed western bypass may have a negative impact on the viability of the ponds.	Confirm the extent to which the site will be impacted on through the construction and commissioning of the Western Bypass link. If the site will be maintained to some degree, the following should be considered: • Provide a safe route across Main North Road to improve the accessibility of Belfast oxidation ponds. • Enhance or develop the oxidation ponds to cater for increased recreational use of the area. • Rezone from Rural 3 to Open Space 2 • Link the Belfast Oxidation Ponds to the Waimari walkway that leads to the Groynes Recreation Reserve, via Darroch.	Land purchase Council works and services Liaison with New Zealand Transport Agency	CCC New Zealand Transport Agency	Ongoing
8	The Transport Network	This includes the proposed Northern Arterial, the proposed Western bypass, Main North Road and Johns Road.	1	New Zealand Transport Agency CCC Capital expenditure Designation	The transport network in Belfast currently acts as a significant constraint to access with regard to local recreation reserves and facilities. There are a lack of integrated facilities for walking, cycling and public transport within Belfast, which restricts access to recreational facilities and reserves. There are high levels of heavy traffic flowing through Belfast, which act as a barrier to access.	Work with New Zealand Transport Agency to ensure appropriate improvements are made to the transport network.	Liaison with other agencies.	CCC New Zealand Transport Agency	Ongoing
						Investigate the feasibility of a public transport interchange for bus and rail services near a central focal point.	Modal split assessment with other agencies	CCC New Zealand Transport Agency	**$$$**
						Coordinate and increase engagement into removing the heavy traffic from central Belfast as a component of the Northern Christchurch Transport Study.	Liaison with other agencies Implementation of Northern / Western bypasses	CCC New Zealand Transport Agency	N/A
9	Waterways	Styx River, Smacks Creek and Kaputone Stream.	1	Protection under the City Plan	The waterway margins within Belfast are important aspects of the Green network, which provide significant connectivity throughout the area and a recreational	Create recreational and ecological corridors along significant waterways as a means of joining open space areas, particularly along the Kaputone Stream and the Styx River. Green corridors of	Esplanade Reserve Land purchase	CCC	**$$$$$**

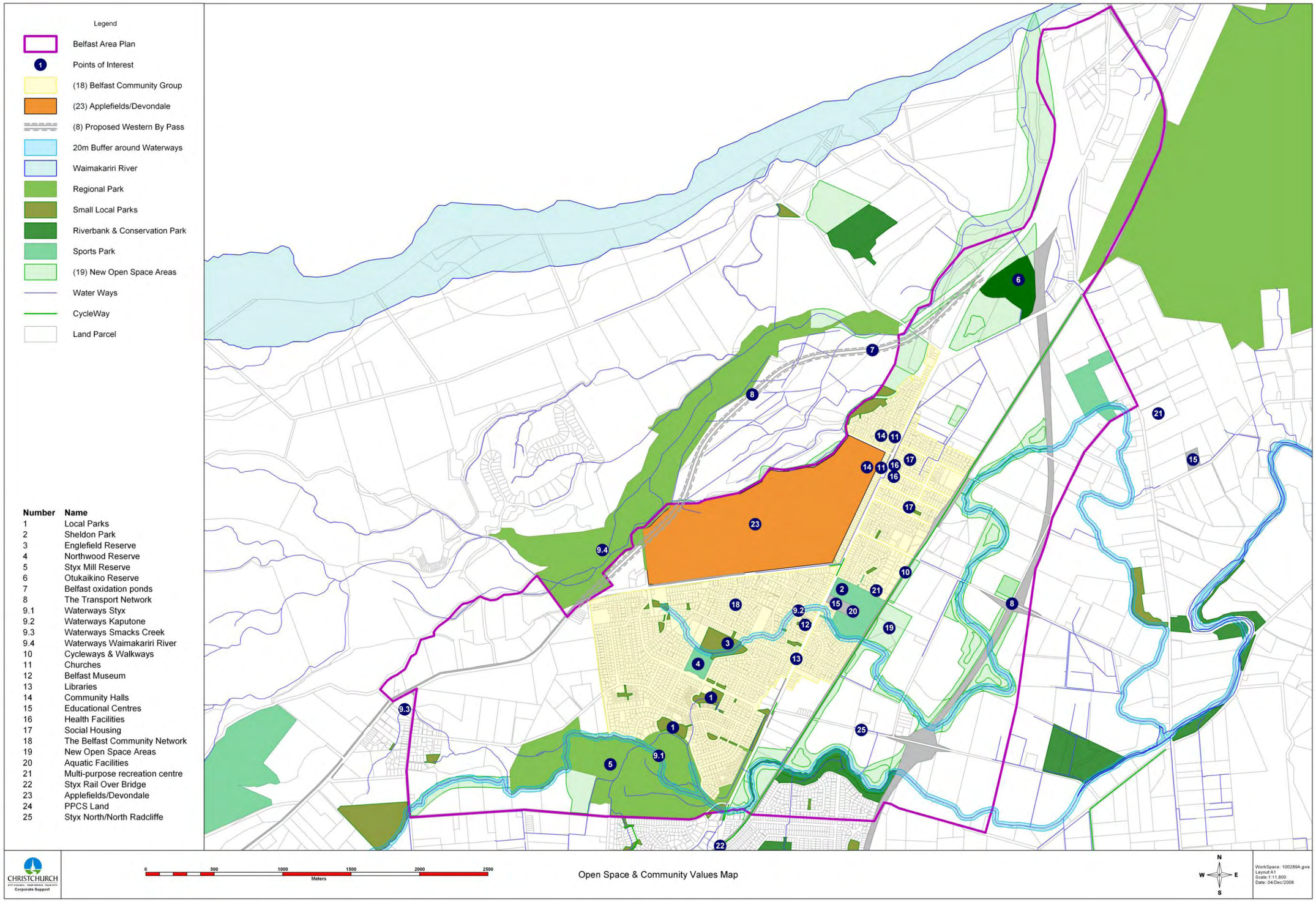
					resource. The potential for creating significant green corridors, however, may be constrained by increasing urban development in the area.	sufficient width along significant waterways could also help to maintain the village character of Belfast.			
						Link and/or extend existing esplanade reserves.	Land purchase	CCC	Variable
Ongoing	Cycleways and walkways	Increasing permeability throughout Belfast.	2	CCC Landowners OnTrack	There are a lack of integrated cycleways and walkways in Belfast. There is a lack of connectivity between existing walkways and cycleways and recreational areas and other areas outside Belfast. The railway corridor provides opportunities to extend the existing walkway/cycleway from Papanui further to the north.	Increase the provision of walkways and cycleways.	Land purchase	CCC	Ongoing
						Use walkways to connect reserves and other open spaces areas and create enjoyable walking routes.	Reserve contribution Land purchase Infrastructure provision	CCC	Ongoing
						Create a range of short and long cycling routes that link to areas outside Belfast.	Reserve contribution Land purchase Infrastructure provision	CCC	Variable
						Identify cycleway and walkway links throughout the area.	Research	CCC	Ongoing
						Extend the rail corridor cycleway/walkway from Papanui through to Belfast.	Land purchase Liaison with other agencies	CCC OnTrack	Variable
						Identify the best pedestrian crossing points on major roads and railways.	Research	CCC New Zealand Transport Agency	Ongoing
11	Churches	The Salvation Army, St David's Anglican Church, Christchurch North Elim Church and Riverlands Seventh Day Adventists are located within Belfast. As well as providing places of worship and community support, they also provide halls, which are usually available for community use.	4	In private ownership	Churches provide significant community services for the Belfast area, including a recreation function, but generally receive low levels of external support.	Support local churches in their provision of welfare services and community hall facilities.	Liaison with other agencies Financial Grants from CCC	CCC Church Groups	Ongoing
12	Belfast Museum	Belfast has its own museum, which is based at Kapuatohe Reserve/ Historic Schoolhouse.	4	Group two heritage protection in the City Plan	Belfast museum provides an underutilised recreation resource for local residents, and provides an important link to the history of the area.	Continue to support and enhance Belfast museum.	Council works and services	CCC	Ongoing
13	Libraries	Belfast is currently serviced by the mobile library. Considering the expected population growth, however, Belfast will soon require library facilities of its own.	2	N/A	As the Belfast community continues to grow, there is likely to be increased demand for library facilities, which would provide significant passive recreation opportunities.	Investigate possible locations for a public library in Belfast, as a part of the Libraries 2025 Facilities Plan.	Research/feasibility study	CCC	Variable
						Assess community need for library facilities through joint consultation of the Area Plan and Libraries 2025 Facilities Plan.	Community consultation	CCC	$
						Ensure sufficient, accessible and well-positioned land is set aside to ensure that appropriate and accessible library facilities can be created in the future.	Land swap Land purchase	CCC Ministry of Education	Ongoing
14	Community halls	At present, there are no independent community halls in Belfast. Existing halls are associated with	4	N/A	There are a lack of independent community halls in Belfast.	Develop a community hall for Belfast, where shared facilities with a potential library for the area cannot be delivered.	Land purchase	CCC	NA (Given low priority for this mechanism)

		local churches.							
15	Educational centres	There are a number of educational centres in Belfast, including kindergartens, preschools, play centres and schools.	2	In private ownership or owned by the Ministry of Education	Urban growth in Belfast and an increase in the number of children in the area will raise demand for educational centres.	Communicate with government agencies, iwi and non-profit agencies to ensure coordinated planning for service delivery.	Consultation with community groups and local agencies	CCC Ministry of Education Iwi Community groups	Ongoing
						Ensure that there is adequate land available within Belfast to accommodate a new primary school in the future.	Zoning Designation	CCC Ministry of Education	Ongoing
16	Health facilities	The Belfast Medical Centre is the main health facility located in Belfast. The St John's ambulance is also based in Belfast at the Elim Church premises. There is also a rest home for the elderly located in Belfast.	4	In private ownership	Urban growth in Belfast will lead to an increase in demand for community health facilities.	Communicate with government agencies, iwi and non-profit agencies to ensure coordinated planning for service delivery.	Consultation with community groups and local agencies	CCC Canterbury District Health Board	Ongoing
17	Social housing	The CCC owns two areas of housing within the Belfast area, which are located in Cleland Street and Tyrone Street.	5	In Council ownership	Urban growth in Belfast will increase for social housing.	Provide ongoing support and maintenance for social housing. It is noted that there is presently no plans for extending housing stock in Belfast.	Tenancy liaison	CCC	Ongoing
18	The Belfast Community Network	The Belfast Community network represents a number of local groups, including churches, residents groups, Plunket, school and sports groups.	2	Largely independent	The Belfast community network supports local groups and residents in a range of areas, but its operation is currently under threat, as it requires new premises from which to base its activities.	Assist and advise the Belfast Community Network in their efforts to relocate to larger premises within the area.	Land purchase Liaison and facilitation	CCC Community groups Funding grants	Variable
19	New open space areas	Although Belfast has a number of existing parks and reserves, significant projected population growth in the area is likely to increase demand for open space.	1	N/A	The growth of Belfast's residential population will increase demand for new open space areas. New reserves should be developed in an integrated and connected manner.	Internalise recreation opportunities within larger residential areas.	Development contribution Land purchase	CCC Developers	Ongoing
						Investigate the need for an additional sports park or reserve in the north and west of Belfast.	Research	CCC	$
						Co-locate future reserve areas with stormwater detention basins.	Designation Land purchase Subdivision process	CCC	Variable
						Develop a neighbourhood park to the east of the railway line.	Land purchase	CCC	Variable
						Ensure that any new reserve areas are multipurpose, combining stormwater treatment, biodiversity, recreation, walkways and cycle ways.	Implementation of Open Space Strategy Subdivision process	CCC	Variable
						Extension of the Groynes into that area between Otukaikino River, the proposed Western Bypass and the Section 293 land.	Designation Land purchase	CCC New Zealand Transport Agency	Variable
						Develop wide esplanade reserves to form a green path along the waterways that run through Belfast, particularly the Kaputone Stream and the Styx River.	Esplanade Reserves	CCC	Variable

20	Aquatic facilities	There is a swimming pool located at Sheldon Park; however, it is in poor condition. Given the expected increase in the residential population, Belfast is likely to require adequate access to swimming facilities.	3	N/A	Increased population growth in Belfast is likely to increase demand fro upgraded aquatic facilities. The existing swimming pool is insufficient to cater for increased demand.	Ensure that swimming pool facilities are accessible for Belfast residents.	Liaison	CCC Belfast Primary School	Ongoing
						Ensure that the growth potential of Belfast is incorporated within any determination of the provision of future aquatic facilities in Belfast.	Community consultation	CCC	Ongoing
21	Multi-purpose recreation centre	Council research and community consultation has identified the need for a large, multipurpose recreation facility in the area.	5	N/A	As the community grows, there will be an increased need for indoor recreation facilities that are accessible to all residents of Belfast.	Develop a multi-purpose recreation facility in Belfast.	Land purchase	CCC	N/A (given low priority for this mechanism)
						Ensure that the facility is accessible for residents of old and new Belfast to improve integration of these areas.	Community consultation	CCC	Variable
22	Styx rail over bridge	The Styx over bridge is the main southern entry and exit point for Belfast and helps to define the boundary for the area.	2	Protected as a road	There is a lack of definition and green space associated with the southern boundary of Belfast.	Increase the provision of open space in the area surrounding Styx over bridge to enhance the green gap between Belfast and other areas.	Land purchase	CCC Land owner	**$$$$$**
23	Devondale/Applefield s site (Section 293)	This is a large area of land in the north west of Belfast that, when developed, will be home to around 2,800 residents.	1	N/A	This Greenfield development land will require new and well-connected open space provision to cater for increases in population. Open space provision in this development should fit within the wider network of reserves and waterways and should not be internalised to the development.	Provide approximately 5.6 hectares of recreation land in this area to cater for a significant population increase.	Development contribution	CCC Developers	Variable
						Create a network of neighbourhood and district parks.	Development contribution	CCC Developer	Variable
						Ensure that a network walkways, cycle ways and stormwater treatment areas link neighbourhood parks.	Outline Development Plan City Plan	CCC Developer	Ongoing
						Enhance existing land features and artificial waterways.	Outline Development Plan City Plan	CCC Developer	Ongoing
24	PPCS land	This is a large area of industrial land in the east of Belfast. It is currently occupied by the freezing works; however, should this site close and be sold, there is potential to redevelop this block into a large residential area.	3	N/A	If this land is developed in the future, there is a danger it is vital that sufficient open space is provided and that it is well-linked with the existing network, particularly Sheldon Park to the west of Belfast. Development of PPCS land may further threaten the recreational and ecological values associated with Kaputone Stream.	Ensure that sufficient open space is created if this area is developed in the future.	Development contribution	CCC Developer	Ongoing
						Develop linkages from the PPCS land through to Sheldon Park and other open space areas.	Outline Development Plan City Plan	CCC Developer	Ongoing
						Start talks with PPCS owners/developers to obtain protection for Kaputone stream, margins and springs.	Negotiation related to concept planning	CCC Developer	N/A
25	Styx North/Radcliffe North	The Styx North area is approximately 31 ha bounded by the Styx River to the south, Main North Road to the west and Radcliffe to the east. Radcliffe North is a 19-hectare area bounded by Thompsons, Radcliffe and Blakes	2	N/A	As with other proposed Greenfield development sites, population growth is likely to increase the pressure on waterways and their margins, and there will be increased demand for access to existing recreational resources.	Ensure that esplanade reserves of a substantial width are obtained along the Styx and Kaputone Rivers.	Esplanade reserve Land purchase	CCC Developers	Variable
						Develop a walkway link between the Kaputone and Styx River, which would allow for the development of a short circular walkway between the two waterways and Sheldon Park.	Land purchase	CCC	Variable

		Road. Both areas are proposed to become predominantly residential, which will increase opportunities for the provision of open spaces and green linkages.							
26	The Groynes	A large regional park over 92ha on the western flank of Belfast. The Groynes provides significant open space provision for Belfast residents as well as habitat for fish and birds.	1	Protected in the City Plan as a regional park. Riparian areas within the Groynes are also protected as ecological heritage sites in the City Plan.	The Groynes is relatively well protected compared to other areas of significant natural values in the area. However, as Belfast grows there is likely to be increasing recreational use of this area, which will put pressure on existing natural values.	Monitor recreational use of the Groynes, and determine the optimal carrying capacity for the park.	Monitoring	CCC	Ongoing
						Develop a well-linked network of recreation reserves beyond the Groynes to offset increasing demand for the Groynes.	Strategic land purchase		Variable
					Separation of incompatible user groups, particularly on the waterways.	Restrict recreational use of waterways in sensitive areas.	Enforcement of the Parks and Reserves Bylaw		N/A
					Linking the Groynes with other open space areas in Belfast.	Create a network of green corridors to link the Groynes with other open space and conservation areas in Belfast.	Land purchase		Variable
					The effects of the proposed Western Bypass on the Groynes, including possible contaminated runoff, traffic noise and visual distractions. The effects of the positioning and construction of the secondary stopbank.	Monitor the effects of adjacent development, such as the Western Bypass and Secondary stop bank.	Monitoring		Ongoing

7.6 Open space and community values map



8. Surface and Ground Water Values

8.1 Introduction

Belfast is undergoing significant change as a result to decisions on land zoning to allow for urban growth. This is likely to have a significant impact on surface/ground water quality and quantity in Belfast. In the context of this report, surface water refers to all water that is naturally open to the atmosphere and which collects on the ground or in streams, rivers, lakes or estuaries. Surface water also includes stormwater (water that originates during rainfall) and surface runoff, which either flows into surface waterways or is channelled into stormwater systems. Groundwater, on the other hand, refers to all of the water that lies under the surface of the ground above an impermeable layer, and is derived from the percolation of rainwater, infiltration from rivers and streams, and water trapped in sediment at its time of deposition. This section of the report is informed by a number of background reports, including:

- Groundwater assessment for Belfast Area Plan and Styx Catchment (Pattle Delamore Partners Ltd, 2008);
- Belfast surface water and hydrological management and assessment (GHD, 2007); and
- Belfast Area Plan: Infrastructure analysis and costings (GHD, 2007).

This section also incorporates information derived from the development phase of the Belfast Blueprint. These background reports should be consulted for a more in-depth analysis of the surface and groundwater values in Belfast and are referenced in full at the end of this document.

Belfast is characterised by a network of waterways and floodplains, which are sensitive to the effects of land use activities associated with urban development. Without good management, urbanisation can lead to an increased risk of sedimentation and waterway contamination. Urbanisation can increase the amount of impervious surfaces, such as roofs and roads, resulting in increased stormwater runoff and a heightened risk of flooding. Of particular concern is the redevelopment of rural land in Belfast for urban purposes, which is likely to result in hydrogeological changes, with potential effects on the runoff response of the catchment. Generally, such changes result in a greater volume of runoff caused by an increase in the total impermeable surface area, together with a quicker response time and higher peak discharge. Urban development can also reduce the amount of surface water filtering down into the groundwater, which may lead to aquifer and spring depletion. The implementation of the Area Plan and the associated urban development will have a significant impact on the management of Belfast's water resources, and stormwater management and mitigation measures will be required to ensure that land development and rezoning does not diminish water quality and quantity.

The preparation of the Belfast Area Plan will benefit from an integrated catchment management plan (ICMP) for the Styx catchment. The ICMP along with the Greenprint will ensure that the ground and surface water system is managed and enhanced for all of its values (referred to as the 'six values'). These six values include ecology, landscape, recreation, heritage, culture and drainage. Such an approach will help to mitigate the negative effects of land development on the community and on water quality and quantity.

The management of surface and ground water in the Belfast area are the joint responsibility of the Christchurch City Council (CCC) and Environment Canterbury (ECan). The CCC has specific responsibilities under the RMA for the management of activities occurring on the surface of waterways, including the following:

- Boating and other activities on the surface of the water;
- Managing the impacts of land use activities, such as construction; and
- Managing riparian margins.

ECan is primarily responsible for the following:

- Water quality and quantity;
- The damming or diversion of water; and
- The discharge of contaminants to water.

There are also overlapping functions between the CCC and ECan, including the control of land use activities, control over the use of the beds of lakes and rivers, the management of riparian margins and stormwater systems. As a result, the CCC and ECan must work together to ensure the protection and enhancement of Belfast's water resources.

8.1.1 PNRRP requirements

ECan has notified a proposed Natural Resources Regional Plan (pNRRP), which includes policies and rules to manage land use and the associated effects on surface/groundwater quality and quantity. With regard to surface water, the pNRRP aims to manage discharges from point sources and non point sources to surface water and to land, prevent the contamination of waterways, manage riparian margins and manage contaminated land. Careful management of Belfast's surface waterways is important as the area's rivers, streams and wetlands have significant natural, heritage, landscape and amenity, and recreation values. In particular, the Styx River corridor is notable for its multiple values, and the pNRRP provides a robust framework for protecting and enhancing such waterways.

With regard to groundwater, the pNRRP seeks to avoid intensification of land use over the western unconfined gravel aquifer in areas that are not already zoned for future development. The pNRRP also requires a high standard of land management (with a particular focus on sewage and stormwater) to minimise the risk of groundwater contamination. Within the Belfast study area, 96 percent of the land has existing urban zoning or occurs over land that ECan accepts poses a low risk of groundwater contamination. In spite of this, it is important to recognise that urban development and the management of stormwater has the potential to alter groundwater levels and stream base flows and to alter the quality of groundwater in the area.

ECan have defined a range of different zones and management rules to protect groundwater from possible contamination resulting from land use activities. ECan's proposed approach to these "Christchurch Groundwater Protection Zones" is presented in Variation 6 of their Proposed Natural Regional Plan. The aquifer zones defined in the PNRRP are as follows:

Zone 1 (high intrinsic hydro-geological vulnerability)

This zone covers the area of the Christchurch groundwater system of high hydro-geological vulnerability. It comprises a significant portion of the recharge area for the Christchurch groundwater system. Substantial areas of this land have very thin soils over highly permeable gravel. Groundwater varies in depth from less than 1 metre below ground level near the Waimakariri River to greater than 10 metres below ground level near West Melton. It is characterised by the absence of an adequate surface-confining layer and the absence of upwards groundwater pressure. As such, contaminants can easily move downwards into the groundwater system with minimal natural treatment. Zone 1 occurs at the western end of the Styx catchment.

Zone 2 (transition in intrinsic hydro-geological vulnerability)

This zone covers the area of the Christchurch groundwater system where the hydro-geological vulnerability transitions from high to low. It is that area where there is uncertainty in the existence/extent

of a surface confining layer and/or the direction of the groundwater pressure. Areas where the surface confining layer is greater than 3 metres thick and where the aquifer pressure gradient is uncertain are included in this zone. Zone 2 occurs as several patchy areas in the middle of the Styx catchment.

Zone 3 (low intrinsic hydro-geological vulnerability)
This zone covers the area of the Christchurch groundwater system of low hydro-geological vulnerability. This low vulnerability is due to the presence of both an effective surface confining layer of between 3 metres to 45 metres thick and a constant natural upwards groundwater pressure. Zone 3 occurs at the eastern end of the Styx catchment.

In order to facilitate the establishment and continuation of appropriate activities within the area of high hydro-geological vulnerability, a number of sub-zones have been established by ECan. For the purposes of the PNRRP, the sub-zones are discrete from Zone 1. The sub-zones that occur within the Styx catchment are as follows:

Sub-Zone 1A (Urban): this sub-zone recognises that part of Zone 1 that is currently, or is planned to be, used for urban purposes.

Sub-Zone 1B (Mineral Extraction): this sub-zone recognises areas identified for mineral extraction, being those areas zoned Rural Quarry within the City of Christchurch District Plan and designated for this purpose in the Proposed Selwyn District Plan. It includes the Isaacs Quarry area along McLeans Island Road at the western end of the Styx catchment.

Sub-Zone 1C (Christchurch International Airport): this sub-zone recognises areas associated with the operational and functional needs of the Christchurch International Airport. It is partly located within the western part of the Styx Catchment.

Sub-Zone 1D (Designations): this sub-zone recognises areas associated with regionally significant activities such as the state highway network, prisons and land associated with the Ministry of Defence activities. These areas are designated within the respective City of Christchurch District Plan and Proposed Selwyn District Plan. A section of State Highway 1 passes through the Styx catchment.

8.1.2 Iwi values
Traditionally, water was at the centre of activity within Māori society because of the resources it supported, the preferential location of settlements close to water bodies, for spiritual beliefs and for recreation. The Mauri (life force) of the water in Belfast is of critical significance as high quality water supports mahinga kai (food gathering) and spiritual activities. Mahinga kai is central to the Ngāi Tahu way of life. It encompasses the whole food chain from the mountains to the ocean (i.e. food, other resources and the areas they are sourced from). The collection and processing of mahinga kai is an important social and economic activity. Protection of the waters in Belfast is necessary due to past destruction of habitat, lack of access, farming activities and the introduction of predators to the area. It is, therefore, important that waters and wetlands are protected and maintained for mahinga kai and are accessible to the Ngāi Tahu. In addition to mahinga kai, water also has spiritual significance for Ngāi Tahu. Otukaikino pool, in particular, was used by local Māori for burial preparation and is regarded as a sacred site. Such areas also require a high degree of protection from urbanisation.

Surface and ground water will need to be managed within the Belfast area to support Māori cultural activities and spiritual practices. The Greenprint and the subsequent Area Plan will seek to protect and enhance water-related values that have significance for local Māori. Any alterations to waterways in Belfast, including the introduction of stormwater detention and treatment areas, should be undertaken after consultation and with the full support of local iwi.

8.2 Surface and groundwater values

8.2.1 Surface waterways
Belfast is located within the Styx River Catchment, and there are three main waterways in the area: the south branch of the Waimakariri River, Kaputone Creek and the Styx River. All of these waterways are spring fed. The Styx River and Kaputone Creek are the most significant waterways in the area because of their high ecological values and water quality, particularly in the upper reaches. The Belfast Area is also associated with the Johns and Wilson's drainage systems, which are separate from the Styx River catchment and discharge to the south branch of the Waimakariri River. Surface waterways serve an important drainage function for residential areas in Belfast. The Styx River system discharges to Brooklands Lagoon, which then discharges to the Waimakariri River. The Northwood development drains south and is discharged into the Styx River, and Wilsons Drain serves older parts of Belfast. The Kaputone Stream drains a number of other residential areas in the east of Belfast. Major waterway such as the Styx River and Kaputone Stream run through residential and industrial areas, and as Belfast develops further these waterways will need to be protected from contamination associated with runoff and discharges from homes and businesses.

8.2.2 Springs
Groundwater enters the waterways in Belfast either as a general seepage through the streambed or as springs. The rate of seepage depends on the relative elevation between the groundwater levels and the water level in the stream channel as well as the hydraulic conductivity of the strata in and around the streambed. Land use activities, including urban development and stormwater management, that affect groundwater levels will also have an influence on spring discharges and the flows in surface waterways. Waterways in the Styx catchment are most sensitive to these effects at the western end of the catchment where there is the most permeable degree of hydraulic connection between the groundwater and the surface flow. There are also discrete zones within the gravel strata where high rates of groundwater flow occur and these are sometimes linked to spring discharges. If such zones of groundwater flow are intercepted or diverted by excavation works, such as underground service trenches or building basements, this could lead to a loss of flow at the spring discharge point. A possible example of this may have occurred in the Kaputone Stream, which experienced reduced water levels that coincided with the development of the Northwood subdivision between 2000 and 2004.

A large number of springs rise in the area bounded by Belfast Road, Crawford Road, Radcliffe Road and Kaputone Creek. These springs contribute surface water to the drains and waterways in this area. High groundwater levels exist here with an associated risk of contamination via activities at the ground surface. As urban development continues to occur in the Belfast area, there will need to be strict controls on land use activities that could potentially disrupt groundwater levels and reduce the flow of water in springs and waterways. The Greenprint, Blueprint and the resulting Belfast Area Plan will provide protection for natural springs and mitigate the negative effects of land use activities on this water resource.

8.2.3 Stormwater management systems
The existing stormwater drainage system in Belfast is composed predominantly of box drains and piped stormwater reticulation, which discharge directly to the Styx River, Kaputone Stream and the Waimakariri River. Newer residential areas, such as Northwood, have begun to incorporate more naturalised stormwater management systems, which support a range of values in addition to the removal of stormwater. These values include water detention and treatment, amenity, ecology and recreation.

Modern stormwater management techniques involve the use of such mechanisms as swales, soakage basins and detention basins. As urbanisation increases in Belfast, there is likely to be an increase in impervious surfaces and construction activity, which is likely to increase the stormwater runoff and contamination of water resources. In order to mitigate the negative effects of urbanisation, the implementation of the Belfast Area Plan and Styx ICMP will promote the use of integrated and naturalised stormwater management systems. Areas within an aquifer recharge zone should be treated with care in the disposal of runoff from future developments. These areas are sensitive to groundwater contamination, and industrial land use is not recommended.

8.2.4 Ground Water

Local residents value the high quality of Christchurch's groundwater, and the protection of this resource from contamination is a significant issue facing Christchurch. Groundwater is largely fed by rainfall recharge through permeable gravels, and the disposal of stormwater and other run-off into the aquifers can have ramifications for groundwater quality if it not properly managed. Belfast is characterised by a range of geologic deposits that are typical of the alluvial and coastal strata in the Christchurch area. These range from free-draining, highly permeable gravels associated with the Waimakariri River in the west, interspersed with lower permeability silt and sand deposits that thicken in an eastwards direction before dune sands begin to dominate the surface geology eastwards toward the coastal margin. In the centre and eastern side of the catchment, several discrete gravel aquifers occur at depth, which are separated by lower permeability silty and sandy deposits formed in a marine or coastal environment. The gravel strata in the western catchment are conducive to stormwater management systems that utilise ground soakage; however, over the central and eastern parts of the catchment, including much of Belfast, ground soakage options are likely to be limited by lower permeability strata and a shallow water table. In some areas, the shallow water table may also limit the depth of stormwater detention basins.

The gravel aquifers of the Styx catchment provide a water resource for the Belfast community. Records from ECan show 1,755 bores within the Styx catchment boundary. Although 827 are for testing or monitoring purposes, the remaining 928 bores are for drinking water, stock water, irrigation and industrial purposes. The main reason for the absence of deeper bores in this area is that the shallower gravel strata is sufficiently productive and high yielding that there has been little need to drill to greater depths to obtain a good yielding groundwater supply.

Localised contamination of shallow groundwater can occur in the area of old landfills, industrial sites or cemeteries. In isolated areas, some deeper bores also display elevated concentrations of iron, manganese and even arsenic, which arise during reduced groundwater conditions and the presence of organic matter (often peat deposits) within the aquifer. With these exceptions, groundwater quality in the Styx catchment is generally very good. Groundwater quality at depth is better than at shallower depths due to the impacts of land use activities. The relatively good quality groundwater in the Styx catchment is primarily due to the predominance of the steady Waimakariri River seepage, which reduces the potential impact of any contaminants derived from the infiltration of water through the land surface.

8.3 The Blueprint/Blue network

A Blueprint for Belfast is currently being prepared in conjunction with the Greenprint. The purpose of the Blueprint (or Blue Network) is to provide a detailed stormwater catchment management plan, which provides for the integrated management of the stormwater discharge effects from changing urban development in the Belfast area as well as linking with the conservation reserves and open space network. The Blueprint identifies the strategic stormwater issues and opportunities, and objectives that are likely to arise in the area and provides for suitable detention and treatment because of such development.

8.3.1 The Framework

The ability to retain surface water reduces the requirement for extensive drainage infrastructure, and can consequently reduce ongoing maintenance of such infrastructure. A successful drainage network for the Belfast area includes the following:

- The incorporation of streams, ponds and lakes into the surface water retention system;
- Providing visually attractive public spaces and enhanced ecological habitats (where these are not mutually exclusive);
- Integrating surface water management in Belfast with the recycling of grey water, where appropriate (run off from roofs and hard surfaces such as car parks).

The Blueprint addresses four key functions regarding the management of urban waterways in the Belfast area:

1 *Water sensitive urban design*
The application of water sensitive design principles, including managing stormwater run off volumes and quality.

2 *Stormwater run off*
Stormwater retention ponds are to be included, overland flows paths, and first flush treatment areas are to be component of the treatment train, and should be visually attractive and add to public amenity.

3 *Low Impact measures*
Low impact run off water management is applied using such mechanisms as swales and permeable surface materials.

4 *Zero impact on base flow*
Consequential development is to result in zero loss of base flow within groundwater catchments. This is likely to require significant assessment and resultant monitoring requirements as to the impacts of laying sub-soil infrastructure within the area.

8.3.2 Design Assumptions for the Blue Network

The potential distribution of urban development is constrained to a certain extent by the ability to deal with surface water shed during rain storms. Ideally, stormwater runoff would be managed so that it is released to the natural environment in a manner that is similar to the pre-urbanised flow pattern.

In areas where surface water infiltration into the ground is not possible, detention mechanisms are required, which will include the controlled release of water to the natural surface waterway system at a time and rate that allows safe and efficient discharge. In areas underlain by permeable gravel (for example, in the southern extent of Belfast such as around Northwood), stormwater can infiltrate directly to groundwater.

The design assumptions for the Blue Network are based on achieving minimum levels of service for surface water management that Christchurch City Council has determined and notified as minimum standards through the Long Term Council Community Plan consultation process. The level of service provided by Christchurch City Council is outlined in the Infrastructure Design Standard and the Waterways, Wetlands and Drainage Guide (1999).

The 'Infrastructure Design Standard' and the 'Waterways, Wetlands and Drainage Guide' are important documents in ensuring the level of service is provided and infrastructure is designed to standards approved by Christchurch City Council. This will ensure that infrastructure and developments within Belfast will be implemented such that secondary overflows paths are maintained or provided, correct reticulation capacity is made available, properties are protected from flooding and developments will be

compatible with the surface water management scheme (based on six values approach) proposed by Christchurch City Council.

The following are the base parameters from those documents that have been utilised in the preparation of the Blueprint:

- First flush volumes have been assessed using a rainfall capture for the first 25mm;
- Capture and retention have been designed to respond to a 50-year storm event; and
- Land for the treatment train has been identified in rural areas, including a network of swales, soil adsorption basins, sedimentation basins, wet ponds, wetlands, detention ponds, detention basins, and rapid soakage shafts and trenches.

8.4 Key Issues

- Designing surface water corridors and detention areas as naturalised features, incorporating riparian planting, walking and cycling paths, and cultural and heritage features;
- Ensuring that connections are established with wider ecological corridors and open space networks, including those associated with the Styx Mill Conservation Reserve and the Styx and Kaputone River Corridors, as part of a multi-value approach in establishing the green network;
- Ensuring that surface water management in Belfast takes into consideration the wider stormwater catchment boundaries;
- Maintaining a high and acceptable standard of drinking water at CCC water supply wells;
- Maximising on-site treatment/discharge in industrial zones to residential levels;
- Protecting the subterranean flow patterns that supply existing springs;
- Improving stormwater management in existing development zones;
- Ensuring the management of surface and groundwater supports Māori cultural activities, and ensuring that iwi have access to culturally significant waterways;
- Managing the disposal of stormwater in a manner which minimises potential flooding and promotes groundwater recharge;
- Managing the location and scale of land use activities and the disposal of stormwater in a manner which minimises pollution in surface waters;
- Protecting the natural functioning the flood plains and retention basins;
- Maintaining groundwater recharge in the western part of the catchment to ensure that groundwater levels remain stable;
- Utilising detention areas of an appropriate depth in the central and eastern parts of the catchment to relieve the pressure on existing stormwater channels;
- Mitigating the negative effects of drainage or dewatering associated with new developments, particularly associated with the development of underground service trenches and subsurface structures;
- Remediation of past adverse effects on the surface water system that have occurred as a result of the modification of waterways and land development;
- Minimising silt loadings in streams;
- Designing surface water systems to be flexible and responsive to future pressures;
- Creating a surface water management system that satisfies multiple values including natural, landscape, tangata whenua, heritage and recreation values;
- Ensuring user's meet costs associated with fulfilling statutory requirements for water quality and quantity and providing surface water management facilities;
- Undertaking stringent monitoring and enforcement of water resources to ensure high water quality.

8.5 Surface and Groundwater vision

To manage increased runoff and the disposal of stormwater as a consequence of land use change in the Belfast area in a manner that protects, maintains and enhances:
(a) The quality and availability of Belfast's surface- and ground-water resources;
(b) Natural values;
(c) Amenity values;
(d) Public accessibility of waterways and their margins.

8.6 Sites of significance

For the purposes of Blueprint/Blue network development, Belfast has been divided into a number of sub-catchments. These catchments form the basis for a consideration of the surface and groundwater values that exist in the area. In addition to the sub-catchments, the waterways and natural springs are significant features of the environment, which will require protection as a consequence of urban development.

Map Number	Site Name/Location	Description	Perceived value 1 – High 5 – Low	Statutory Protection	Issues	Recommended actions	Preferred mechanisms	Responsibility	Approximate costs
1	Styx River	The Styx River and its tributaries provide significant natural drainage for water originating from the surrounding wetlands and floodplains, a catchment of some 50 square kilometres. A wide range of indigenous, fauna including wetland and bush birds, insects, bats, and a range of native fish exist in the supporting habitats provided by the Styx to Brooklands Lagoon.	1	Identified as Section 6(a) features within the City Plan (refer Volume 2, Section 2)	Removal of vegetation from riparian margins in Belfast is resulting in the loss of habitat, and potentially increasing erosion. Straightening, widening and hard edging of waterways has created a homogenous environment with few habitat values. This process has increased the rate of water flow and may increase flood levels in times of high rainfall. In-stream obstructions such as weirs and dams, block routes for wildlife such as fish. Natural obstructions such as some fallen vegetation can actually provide habitat. Contamination arising for untreated discharges; including stormwater discharges, reducing water quality. Water abstraction of both surface waters and hydraulically linked groundwater can reduce groundwater levels, as well as spring flows and surface water quantities. Infrequent weed removal from waterways, which can lead to the choking of ecological values and a decrease in detention capacity. Infilling of springs and wetlands and waterway margins can affect water quality, reduce habitat and lead to a loss of wetlands, which act as sponges in times of floods and reservoirs in times of drought.	Increase the planting of riparian margins. Undertake a process of waterway naturalisation, particularly in urban areas. Increase monitoring of water quality in major waterways in Belfast. Enforce regional water quality standards and prosecute individuals or groups who are found to be polluting waterways. Monitor groundwater abstraction in Belfast, and investigate possible negative outcomes, such as reduced spring flows. Increase weed clearance. Monitor and mitigate the effects of changing land use on local waterways.	Subdivision controls and guidelines. Land use management controls. Increased Council monitoring and weed removal. ICMP process.	CCC ECan Private developers	Variable
2	Kaputone Stream	The Kaputone Stream flows through the middle of the Belfast Area. As the boundaries of the area do not follow the river catchments, so parts of the Kaputone Stream are outside the area. It is, however, an artificial boundary and the entire Kaputone Stream must be considered in its entirely and not just the portions which lie within Belfast.	1						
3	Smacks Creek	Smacks Creek is a spring-fed tributary of the Styx River; springs along its 2-kilometre length contribute to flow. The width of the Creek varies up to 4 metres and has a depth between 100 to 500mm. The bed of the waterway is gravely with some silt. The water quality appears relatively high and it supports a diversity of aquatic life. The surrounding land use is varied and includes residential, rural and industrial.	1						

		Willowbank Wildlife Reserve is located near the confluence of the Smacks and Kaputone Stream, and downstream on the Styx River is the Styx Mill Conservation Reserve.							
4	Natural Springs	There are a large number of natural springs located throughout the Belfast area. More than twenty-six springs were located in the Styx River sub-catchment during CREAS 2005 survey. Most springs were found in the Styx main stem near Gardeners Road (5), Gardiners Road Drain (3), and Willowbank (4). Nine springs were found west of Marshlands Road.	2						
5	Wilsons and Johns Drains	Wilson's Drain is classed as an environmental asset waterway. It links with Johns drain to form a catchment of some 242ha. Other connecting drains include Wilsons Drain extension (400m), Main North Road to Factory Road (962m); Wilsons residual (1412m). The majority of these timber-lined, open drains were installed around 1963 and are generally 2.1m wide by 1.45m depth. The outlet to the Waimakairiri River is a 1375mm diameter, twin-culvert, floodgate.	3	Some protection under the City Plan	The existing branch of the Drain crossing Tyrone Street and Factory road is undersized and does not meet a two-year ARI storm. The predicted 50 yr flood level is 14.5m in the Waimakariri River, should the flap gate on Wilson's Drain fail, despite requiring a unusual set of circumstances for this to occur, floodwater might back up the Wilson's Drain due to its flat grade.	Possible naturalisation of existing drains, where appropriate. Investigate the possibility of developing in-stream ponding areas or detention basins associated with these drains.	Infrastructure maintenance and replacement with water sensitive mechanisms.		Variable
6	Kaiapoi Bridge sub-catchment	This small 6ha sub-catchment is closely aligned with adjacent land use, hence its character is predominantly made up of extensive industrial activities with minimal infrastructure servicing available.	1	Designation ICMP Plan Change	The area currently drains to the Otukaikino, under the Motorway, with a non-distinct drainage pattern.	Investigate possible linkages with the larger Kainga sub-catchment to provide efficiencies in management. Ensure appropriate filtering from hard stand areas associated with the motorway or significant industrial buildings and car parking areas.	Treatment train. On-site detention or combination with Kainga sub-catchment.	CCC ECan	$$$$$
7	Kainga sub-catchment	The Kainga sub-catchment of some 50ha has a predominantly open industrial character,	1	Designation ICMP Plan Change	The water table can be within 2m in depth, and shallow in winter, which, in conjunction with the sandy soil to the east, can provide soakage on a smaller scale.	The area to the west of Main North Road is served by a series of open drains that discharge into the Wilson's swamp system and under the motorway to the South Branch of the Waimakairiri. The rural land	Treatment train and detention.		

		mainly because of the Business 6 (Rural Industry) or 'dry industry' zoning applied to the area. Drainage of the area is to the Kaianga Drain via a bridged culvert under the Rail corridor.			The site is of some importance to tangata whenua.	lying between the Railway and Main North Road has no clear drainage pattern, but could be designed to drain across the road into the same drainage system. An additional option would be the provision of a significant detention basin at the Kainga drain headwaters to the east of Main North Road. Such a detention and treatment system would be sized at approximately 61,700m^2. All designs and associated excavations should be subject to an 'accidental discovery protocol'. There is a need to be aware of the consequences of treatment for mauri.			
8	Lower Wilsons sub-catchment	A substantial 218-hectare sub-catchment containing urban development to the north of Tyron Street, currently rural zoned land to the north of the existing Belfast settlement, and a substantial low-lying area, including the Conservation 1 zoned Otukaikino Reserve, which has some significance for tangata whenua of the area. The current drainage system is via Wilsons drain, across Main North Road and North West to the Otukaikino Stream.	1	Designation ICMP Plan Change	The site is of some importance to tangata whenua. There is the possibility of an historic night soil landfill in this area that may require remediation if located during construction works associated with stormwater management.	This catchment drains to the northern corner of the site, being the depressed area adjacent to the existing Otukaikino Reserve. Culverts would likely be required to transport water through crossings with the railway line and Main North Road. A significant detention basin is considered appropriate in this instance, not only given the size of the sub-catchment and the ability to provide efficient design, but also as a consequence of providing a dual benefit in increasing the size and value associated with Otukaikino Reserve. Such a detention and treatment system would be sized at approximately 28,300m^2. A smaller, second detention system could be located close to the corner of Marshland and Main North Road, which would provide drainage associated with a more intensive zoning associated with this Environment Canterbury owned block. This detention and treatment system would be approximately 18,600m^2. All designs and associated excavations should be subject to an 'accidental discovery protocol' and there should be an awareness of the consequences of treatment for mauri.	Treatment train and detention.	CCC ECan	**$$$$$**
9	Upper Kaputone sub-catchment	A 94-hectare sub-catchment that is zoned extensively for urban activities, and is, barring in-fill, fully developed. Existing stormwater management is largely successful with little constrictions in existing pipe work or associated surface water flooding identified.	1	Land acquisition Conservation covenants	The upper Kaputone sub-catchment and its associated riparian corridors represents the poorest water quality and ecological values within the Styx Catchment. There is a lack of access to the riparian environment in this area. The area offers little opportunity to retrofit stormwater treatment to a less engineered mechanism than is currently in place.	Improved filtration may be possible especially if the Main North Road carriageway be reduced to provide for road reserve swales. Efforts should also be made to improve riparian access as opportunities arise.	Infrastructure maintenance and replacement.	CCC	Variable
10	Lower Kaputone sub-catchment	This considerable 450-hectare sub-catchment is partially located outside of the Belfast Study area, but, consequently, provides more scope to manage stormwater	1	Designation ICMP Plan Change	Consideration needs to be given to the possible effects of the cemetery on any proposed detention ponds. The ability for the filtration of run off from the proposed northern bypass needs to be carefully considered as well as the opportunity to provide detention areas within an enlarged carriageway buffer, which would also provide acoustic benefits	The area has variable topography, and its alignment with the Kaputone and proposed northern bypass will likely result in a number of discrete treatment and detention areas. Based defining six separate discrete treatment and detention areas, the total land requirement would be	Treatment train and detention	CCC	**$$$$$**

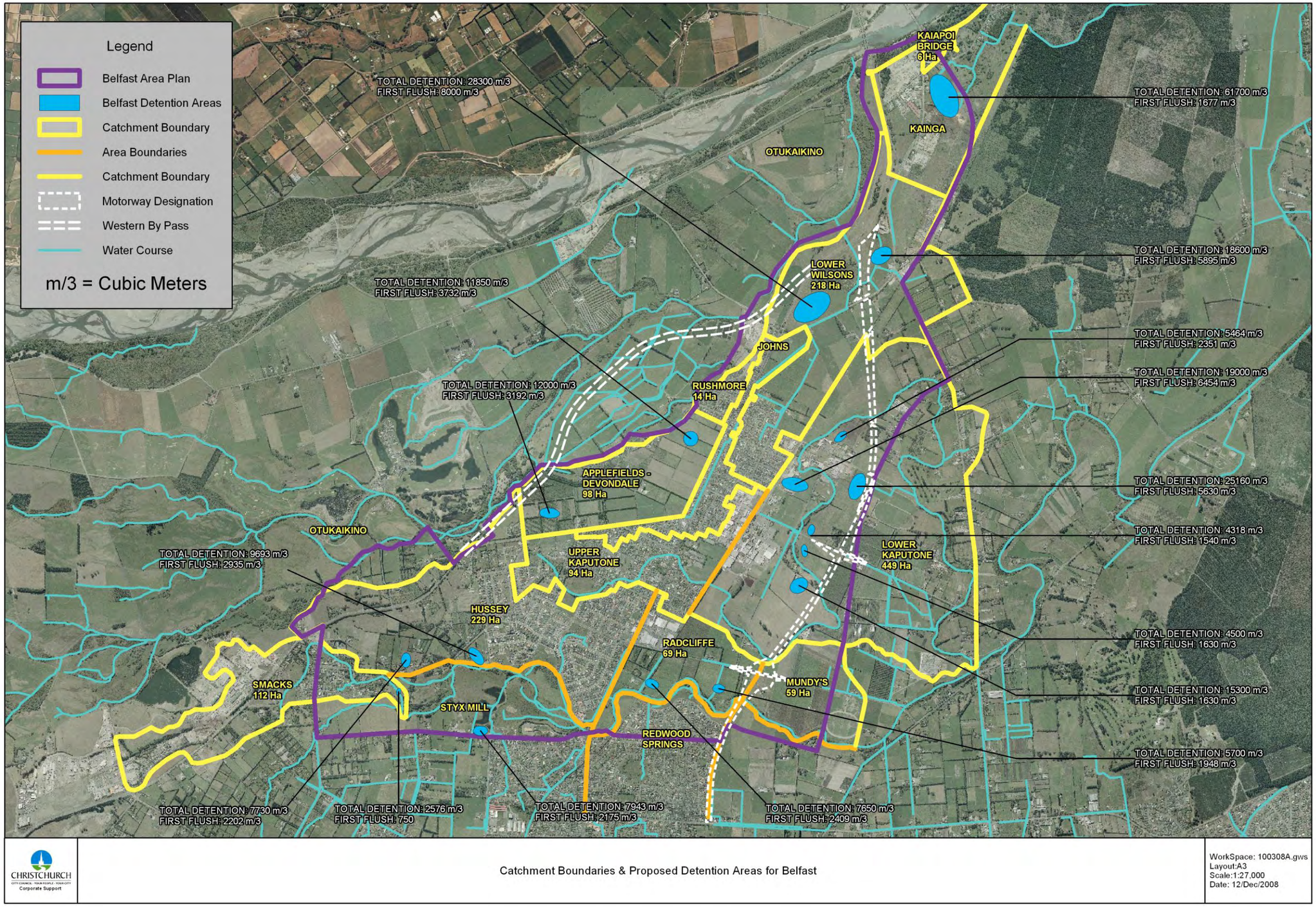
		effects on a significant part of both the Kaputone Creek and the Styx River. The area is combination of existing Industrial land associated with the PPCS freezing works, an extensive rural land to the east. Surface water drains directly to the Kaputone for the majority of this catchment, although at its southern boundary there is drainage through to the Styx. An existing open channel drains the east side of Guthries Road. Over the falloff, land suggests detention and discharge to the Kaputone is better suited to the north of the site, taking care not create hydrological loss to the Styx.			through increased separation to any future residents.	73,742m^2, based on the following treatment areas: • 15,,300m^2 • 4,500m^2 • 4,318m^2 • 19,000m^2 • 5,464m^2 • 25,160m^2			
11	Johns sub-catchment	The Johns Road sub-catchment is a 30-hectare, linear catchment in predominantly residential areas, although there is a small rural area to the far north of the sub-catchment. Drainage is largely via Johns Drain, which has an estimated catachment of 92-hectares, with secondary flows across Tyrone Street to rural-zoned areas to link in with the Lower Wilsons sub-catchment.	2	Land acquisition Operational expenditure	The piped infrastructure through this area is of mixed age and capacity and is at a shallow depth. Consequently, whilst there is some capacity at present flow rates, urban intensification and overflow from new developments, such as the Applefields/Devondale sub-catchment could exceed capacity at peak flows. Infrastructure maintenance and replacement where necessary is the main issue facing this sub-catchment. During extended rainfall events, there are a number of allotments within the 1950s/1960s housing areas of this sub-catchment, which experience some surface flooding. This identifies issues associated with capacity deficiencies and the high invert levels with the existing network.	Improved filtration may be possible especially if the Main North Road carriageway is reduced to provide for road reserve swales. Additional drainage into this network would require careful consideration as to the ability to cater for such demand at peak times.	Treatment train and detention	CCC ECan	Variable
12	Rushmore sub-catchment	This small, 14-hectare sub-catchment has recently been the subject of three residential subdivisions. Existing drainage is via filtering swales and the Darroch St, Middle and Northern outfalls. The Belfast Oxidation ponds (which are no longer utilised) are	2	Land acquisition Operational expenditure.	The ecological potential of retrofitting the oxidation ponds as habitat is likely to be diminished because of the positioning of the Western Bypass corridor in this area. Whilst lower lying land near the Darroch Street pumping station can be subject to localised flooding during extended storm events, stormwater is generally well managed in the area. There may be a requirement to increase capacity when this part of the network reaches the end of its operational life; however, this is not a priority.	Care should be taken that run-off from associated hardstand areas are subject to a high degree of treatment, and that where possible the treatment train associated with such infrastructure links with the Waimari Walkway and the wider Otukaikino Reserve.	Treatment train and detention	CCC ECan	Variable

		located at the Northern extent of this sub-catchment.							
13	Applefields/ Devondale sub-catchment	The Applefields / Devondale site is a predominantly rural area of 107 ha situated between Main North Road, Johns Road and the Waimakariri Stopbank. This area is planned to contain 96-hectares of residential land, zoned LG, and 11-hectares zoned as green open space.	1	Designation ICMP Plan Change	An interim Environment Court Decision (C041/2008) confirmed an appropriate treatment system based on a series of in-road corridor swales and associated detention basins, also including overflow to wetlands outside of the sub-catchment. The area as a whole has no obvious drainage paths, suggesting that the area maybe suited to soakage solutions.	The Environment Court decision should be taken as the basis for stormwater management for the sub-catchment. A Davis Ogilvie (2004) report proposes a soakage solution consisting of two soakage basins for the Applefields area. Should soakage not be feasible, then detention and an outfall to the Waimakariri River would be required. The proposed solution for the Applefields area consists of two detention areas located at the north eastern and south western boundaries respectively, based on draining to a treatment / detention basin for each catchment, as with all sub-catchment, detention basins should be sized to retain the 50-year storm. The required size for these basins has been estimated at 8798m² and 8120m^2 respectively, assuming a one-metre deep detention area. Allowance has been made to construct an outfall for each facility draining to the South Branch of the Waimakariri. The configuration of the facility will allow detention and disposal through soakage of the first flush volumes, 3192m^3 and 3732m^3 respectively with diversion of greater flows to detention, soakage or disposal through an outfall to the Waimakariri River.	Treatment train and detention	CCC	**$$$$$**
14	Smacks sub-catchment	This sub-catchment is a mixture of flat rural farmland; an area of Business 6 (dry industrial) zoning; and the Living 1E (Gardiners Hamlet) zone. There are existing waterways that drain the stormwater treatment ponds from the Gardiners Hamlet area to the Styx River. Contamination loadings from industrial activities are high. The Smacks tributary to the Styx forms one of the pristine waterways in Christchurch.	1	Designation ICMP Retain rural zoning	The area is located on Zone 1 and Zone 2 Christchurch Groundwater Protection Zones and hence development loadings and detention areas would be limited in their application. There is a relatively high contamination loading in the area. The imposition of the 50dBA Ldn Airport Noise Contours to this area would restrict residential development and, therefore, limit the need for stormwater management mechanisms. There is likely to be a need for some degree of increased detention in this area.	The ability to foster mechanisms for stormwater management that would improve the natural and recreational values of Smacks Creek should be encouraged given the high ecological values and inaccessibility of the Smacks Creek tributary. Given the high contamination loadings in the area, there should be a drive to require a higher level of treatment prior to detention, including the ability to require on-site pre-treatment where possible. A small detention pond of 2576m^2 would be required in association with any intensification of the existing zoned land uses in the area to capture and treat run off prior to discharge.	Treatment train and detention	CCC ECan	**$$$$$**
15	Styx Mill sub-catchment	This area is predominantly flat rural farmland with the adjacent Styx River flood plain as a dominant feature. There are some existing waterways that drain the stormwater treatment ponds from the Gardiners Hamlet zone (refer Smacks sub-	1	Designation ICMP Retain rural zoning	The imposition of the 50dBA Ldn Airport Noise Contours to this area would restrict the extent of residential development. There is likely to be a need for some degree of increased detention in this area.	Treatment management for this sub-catchment should be based on the treatment/detention located at a block of land just on the fringe of the existing Styx Mill Reserve, to the north of the existing culvert bringing flows north of Styx Mill Road. The detention area would capture and treat runoff from developments within the small area in the Styx River basin, and possibly limited overflow from development south of Styx Mill Road. The detention area, including first flush, should be	Treatment train and detention	CCC ECan	**$$$$$**

		catchment). A culvert under Husseys Road drains to the Styx River, and ponds to the east of the catchment, which forms part of the Styx Mill Conservation Reserve, are the logical location for additional detention areas.				sized at approximately 7,943m^2. The detention pond would need to be located to ensure that the outfall is above the 50-year flood flows of the Styx River and sized to ensure that the receiving environment does not receive flows greater than those currently occurring given the sensitivity of the Styx Mill basin. In a similar manner, filtration would need to be of a very high quality given the ecological values of the area. The deep timber drain immediately to the north of Styx Mill Road should be naturalised to provide a wide secondary flow path.			
16	Hussey sub-catchment	This 229-hectare sub-catchment incorporates both the newly developed Northwood residential subdivision, with a mix of low- and moderate-density dwellings, and the area to the west, which is primarily rural farmland. The area is relatively flat and naturally drains to both the Styx River and the Kaputone Stream. Within the Northwood subdivision, a series of under drainage soakage systems treat and detain stormwater before release into the Styx. Piping infrastructure and its implications for groundwater recharge to the Kaputone is complex.	1	Designation ICMP Retain rural zoning	The imposition of the 50dBA Ldn Airport Noise Contours to this area would restrict the extent of residential development. Any further piped development would need to be cognisant of the implications on groundwater recharge, specifically to the Kaputone. All stormwater management systems would need to be sized, and of sufficient quality, to ensure that flows to the sensitive Styx Mill basin are of a high quality standard and similar flows as those currently received. Sensitive native plants are located in the area.	Should development occur in that area to the west of the Northwood subdivision, which given the impost of the 50dBA Ldn would be unlikely, two separate treatment/detention areas would be appropriate given the topography of this area. The western-most management area would have a total land requirement of some 7,730m^2, whereas the eastern stormwater/detention area adjacent to the Northwood development would require some 9,693m^2. The location of a sensitive fen habitat within the Styx Mill Reserve should be taken into account in any stormwater management system, specifically where detention basins would be located within close proximity to the Reserve.	Treatment train and detention	CCC ECan	$$$$$
17	Radcliffe sub-catchment	The existing Belfast Supa Centa, and its proposed extension (refer Plan Change 22) are encompassed within what is otherwise a predominantly rural land area. There are two drains that flow directly to the Styx: the Curtis and McFaddens Drains. Curtis drain runs along Radcliff road between Main North Road and the railway line; the drain then turns south and follows the west side of the railway, discharging to the Styx	1	Designation ICMP Plan Change Amendments to Plan Change 22 Increased esplanade reserve requirements.	The creation of a riparian corridor may be difficult given the requirement that detention ponds need to be located to ensure that the outfall is above the 50-year flood flows of the Styx River. There is a need for increased levels of detention in this sub catchment.	The placement of the first flush and detention areas should be done in a manner that achieves an extended esplanade reserve along the Styx where possible. Two discrete treatment/detention areas are identified within this sub-catchment. The first, with a total land area of some 7,650m^2, would capture run off from any increased hardstand associated with an extension of the Supa Centa (and associated residential development fronting the Styx River), via a culvert to a treatment and detention facility east of the rail corridor. This system would also treat and detain any increased flow from Curtis Drain because of urbanisation of areas north of Radcliffe Road. The second treatment/detention area would be located just to the west of the proposed Northern bypass, and treat and detain increased flows from McFaddens drain because of northern urbanisation. There is also the need for the treatment train to	Treatment train and detention	CCC ECan	$$$$$

		River. McFaddens drain is located east of Curtis, following Radcliff Road, before turning south and discharging into the Styx. There are also several undersized private stormwater culverts along Racdcliffe Road.				incorporate run off from the proposed bypass, and the ability to be utilised in conjunction with a required buffer between residential land use and the road corridor.			
18	Redwood Springs sub-catchment	This area has been recently developed as a residential subdivision, with an orderly stormwater management system based on attractive vegetated swales along avenues and a 50m wide esplanade reserve fronting the Styx river. The design parameters for the existing detention basins are currently unknown, but apart from some issues associated with filling along the floodplain, complaints with regard to flooding are not common.	3	Monitoring	Intensification of this area is unlikely, and a recent and comprehensive stormwater management system has been developed in the area. There are issues associated with the design of detention areas.	There is no need to develop further stormwater management systems. The design parameters and responsiveness of the existing detention network for this area should be clarified and monitored.	Infrastructure maintenance	CCC ECan	Variable
V19	Mundys sub-catchment	This area is predominantly rural farmland as located to the east of the proposed North bypass.	3	Retain rural zoning	Rezoning of this area to provide for further intensification is unlikely. The development of NZTA's corridor and stormwater management system associated with the Northern Bypass may affect natural springs and water quality within the catchment.	No further management is recommended. The NZTA's corridor and stormwater management system for the eastern extent of the Northern bypass should be carefully examined and monitored in terms of its implications for natural springs and water quality in the area.	N/A	CCC ECan	Variable

8.7 Belfast Catchments Map



[6]

[6] This map is indicative only and subject to change. A blueprint document for Belfast is currently under development that will include concept plans of the proposed surface and stormwater network.

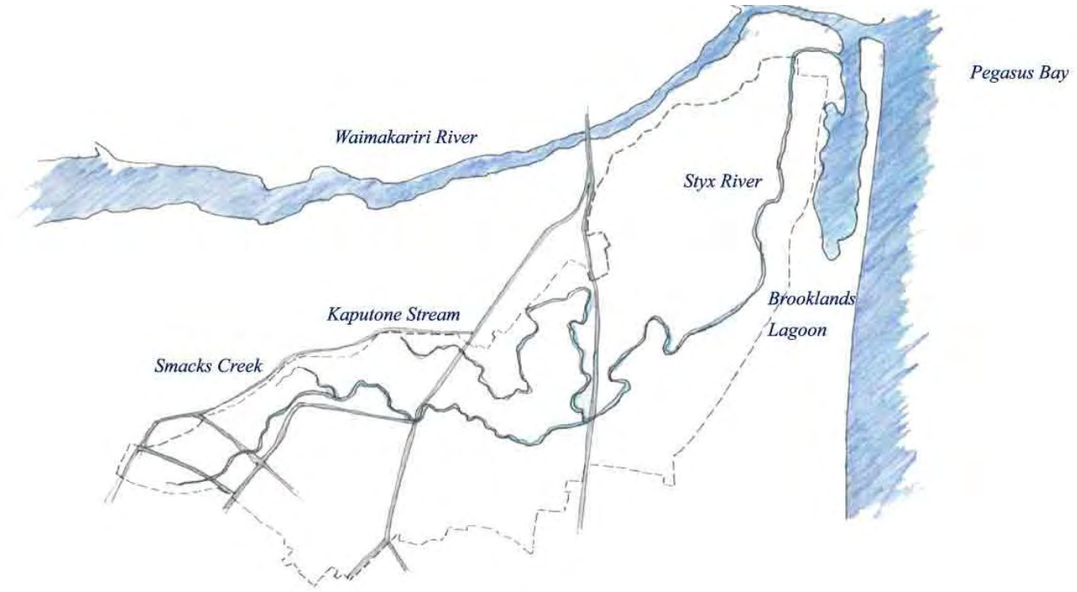
9. The Styx Vision: An enhancement/best practice option for Belfast

9.1 Introduction

The Styx River ecosystem is an important natural feature located near the northern boundary of Christchurch. The Styx River originates in Harewood as a dry swale that is intermittently filled with storm flow. With the emergence of water from springs, it meanders northwards through reserves, rural pastures, horticultural areas and residential developments on its way to the sea via Brooklands Lagoon and the Waimakariri River. Its two main tributaries are Kaputone Stream and Smacks Creek. A number of constructed waterways also drain the wetter areas within the catchment. Low-lying areas are an important characteristic of the catchment. Some of these are protected as they are incorporated within the park system (e.g. Styx Mill Conservation Reserve), while others have been modified and utilised for farming (e.g. the Styx floodplain).

In recent years, this river system has come under increasing pressure from urbanisation. Although the Council recognises the importance of this natural feature and the need to provide long-term protection through the acquisition of land buffers along its riparian edges, this is becoming increasingly difficult, mainly due to the increase in land values and population pressures. This report outlines the values, issues and visions associated with this important waterway. Additionally, it identifies sites where protection is required and proposes mechanisms to achieve long-term protection for the Styx River and its tributaries. This section of the Greenprint is based on a background report prepared by Heremaia (2008). This background report should be consulted for a more in-depth analysis of the values associated with the Styx vision and it is referenced in full at the end of this document.

Figure 5: The Styx River System



9.2 Styx Values

9.2.1 Native vegetation

The natural flora in Belfast before human occupation would have comprised a variety of vegetation types, including the following:

- Wet forest dominated by Kahikatea
- Dry forest dominated by Totara
- Saltmarsh at the river mouth
- Mire wetlands
- Riparian river margins
- Submerged river aquatics
- Savannah on dryland sites
- Coastal sand dunes
- Successional forest following disturbance

Subsequent Māori occupation resulted in significant modification of much of the Canterbury Plains through burning, resulting in an increase in successional vegetation types and a reduction in forest. This change is evident in the dominance of such fire-induced vegetation comprising:

- Tutu and bracken
- Swamp wetlands of Raupo and Flax
- Open grassland
- Shrubland

The process was taken further following European occupation with the intensity of modification, farming and the introduction of an alien flora. The original vegetation in Belfast, as in most of Christchurch, has all but gone, resulting in the predominance of the following:

- Pasture grasslands
- Exotic pine forest
- Swamp wetlands
- Exotic scrub
- Willow riparian margins
- Marram sand dunes and dune migration
- Urban development

There is clearly no opportunity for a return to anything resembling original vegetation; such is the cost of urbanisation and private ownership in Belfast. To regain some of what has been lost, two actions need to be undertaken to protect and restore significant values. The first task is to identify and protect those fragments of indigenous flora that remain. Meurk, Ward and O'Connor (1993) identified these fragments, with those that were considered of greatest value being protected as Ecological Heritage Sites in the Christchurch City Plan. As part of the Belfast Area Plan, many in the Styx catchment were re-surveyed in 2007 (Partridge, 2007). Many sites of the area that had not been protected declined further and required significant repair or restoration. Some sites had completely lost their native vegetation. The priority for the remaining fragments, therefore, is to protect and maintain through appropriate management. The second action is the restoration of that which has been lost. In the case of the Styx catchment, there is so little indigenous vegetation remaining that in order to have natural ecosystems it is necessary to recreate them from scratch. This is a difficult task, which requires careful planning plus a

great deal of experimentation. The obvious starting point, and probably the most straightforward system to restore, are the riparian margins of the Styx River. This involves the conversion of willow forest back to indigenous riparian margins of sedges, rushes and ferns, with adjacent forest and marginal shrubland between. Such a project will require a great deal of effort in terms of landform manipulation, willow management, planting and maintenance. Sites along the river corridor can have larger core areas of wet forest, with other core areas of dry forest away from the river. The wetlands, however, provide a major challenge as it is difficult to create peat-based mire systems, such as fens and bogs, with all the wetlands so far created around Christchurch comprising swamps on a mineral substrate. The true dryland ecosystems, such as savannah, also present a challenge.

Future restoration activities should focus on regenerating the following:

- Riparian corridors
- Wetlands
- Native forest
- Dryland savannah
- Salt Marsh

9.2.2 Birds

Since human settlement of New Zealand, at least 51 bird species have become extinct and many others have become either locally extinct or endangered. Of the 51 extinctions, 21 species managed to survive at least until the arrival of Europeans before they too became extinct, suggesting a range of causes may have contributed their decline. While the exact cause of a species' decline to extinction is often debated, a number of contributing factors including loss of habitat, habitat fragmentation, competition, predation and avian diseases (brought in with European-introduced birds) are likely to have played a part in their demise.

In recent years, Christchurch has seen a renaissance of wetland birds because of riparian and wetland habitat restoration throughout the city. Notable examples include the NZ Scaup and Paradise Shelduck; species which until the 1990s, were absent from urban environments and normally only encountered in high country lakes and rivers. The NZ Scaup is now so prevalent in the City, that since the late 1980's the Christchurch population has increased from an estimated 200 birds to 7500; almost 25% of the worlds entire population of this species residing on Christchurch waterways. Over the past five years, Paradise Shelduck have also begun to re-colonise the city and are now a common sight even in the city's CBD. In addition, the Australasian crested grebe, a critically endangered species normally seen only on high country lakes, has recently been reported within the Christchurch area on the lower Styx River, Roto Kohatu Reserve, and at the Heathcote River. Therefore, if managed well, natural environments within urban areas have a significant potential to provide good wildlife habitat and offer critical conservation function outside the Department of Conservation estate.

Today the Styx Catchment supports a rich avifauna with a relatively high representation of native species compared to other city rivers. For example, the river and margins support six species of native waterfowl (Black Swan, Paradise Shelduck, Grey Duck, New Zealand Shoveler, Grey Teal, New Zealand Scaup); three herons (White Heron, White-faced Heron, Australasian Bittern); three cormorants (Black Cormorant, Little Cormorant, Little Black Cormorant); three rails (Pukeko, Australasian Coot, Marsh Crake); and two waders (Pied Stilt and Spur-winged Plover). Further protection and enhancement of riparian and wetland habitat along the Styx River and tributaries is likely to see increases in a range of other species that have either become locally extinct or are rare visitors to the city. This has been exemplified recently by sightings of critically endangered Australasian crested grebe in three locations in Christchurch, including the Styx River mouth.

Three key ingredients are essential for the long-term protection and enhancement of wetland bird populations on the river:

- Protection & enhancement of the river as an ecological corridor;
- The development and extension of core wetland and dryland habitats;
- The creation of buffer zones between waterways and urban areas.

While the CCC and the community have been successful in providing an enhanced riparian habitat required to sustain a range wetland birds within the city, the provision of good forest bird habitat is greatly limited. One of the major limiting factors in providing such habitat is the lack of appropriate reserve area required to establish sustainable forest ecosystems. Existing conservation and open space areas in the north of city are currently insufficient to support large populations of forest birds. It is estimated, however, that the addition of between 35 and 70 hectares of reserve land in the north of Christchurch would be sufficient to support a large population of native bush birds, such as Tui.

The provision of successful habitats for forest birds is also dependant upon the configuration of the open space and conservation areas. Large round patches of forest are preferable to tracts of linear land due to negative edge effects on the bird population. There also needs to be a degree of connection between forest corridors to enable species to disperse across the area. While it is not desirable to have forest patches too close together (as they may be affected by single catastrophic events), it is desirable to have a network of forest patches that can act as stepping stones and provide a level of functional connectivity across the area.

9.2.3 Bats

Although the occurrence of bats is relatively uncommon within Belfast, there have been sightings of the long tailed bat (Chalinolobus tuberculatus) reported in the vicinity. It is plausible that a small population of native bats may live in or near to Belfast. Christchurch City Council staff and other interested parties are currently working to detect the presence of these species in the area. Ongoing research will be required to identify and or monitor the presence of this species.

9.2.4 Fish

The known natural freshwater fish fauna is composed of ten species, of which eight have marine life stages. In order of abundance, these include Shortfin eel, Longfin eel, Common Bully, Upland Bully, Giant Bully, Brown Trout, Lamprey, Common Smelt, Inanga, and Black Flounder. In addition to these, two relatively recent and illegal introductions into the catchment are the Tench and Goldfish. To date, however, they have only been recorded from shingle pits in the catchment and not the main waterways. In the lower river, some truly marine fish may also be seen. These include the Yellow-eye Mullet, which form conspicuous shoals, but may be confused for trout by some observers.

There are three important habitat areas for aquatic life in the Styx River:

- The lower reaches, including the main stem downstream of Main North Road and Kaputone Stream downstream of Guthries Road;
- The perennial middle reaches, including the Main North Road upstream to Sawyers Arms Road, Smacks Creek up to Smacks Close, Kaputone Stream upstream from Guthries Road to Main North Road, and permanent Marshland Drains;
- Ephemeral upper reaches, including Kaputone upstream of the Main North Road, the main stem upstream of Sawyers Arms Road and Smacks Creek upstream of Smacks Close.

9.2.5 Invertebrates

The invertebrate community of the Styx River was more similar to that of rural rivers near Christchurch, and was in better health than either urban or semi-urban rivers around the Christchurch area. When compared to urban streams nationally, the fauna of the Styx River was some of the highest ranked urban

streams in the country for metrics such as the percentage of mayflies and caddisflies. Other metrics describing the invertebrate communities were within the top 20 percent of values for urban streams nationally. Despite the current high ranking of the Styx when compared to other urban rivers nationally, closer examination of the invertebrate data showed that sensitive taxa such as *Deleatidium* mayflies may be disappearing. There is good evidence in the scientific literature that mayflies and other sensitive freshwater invertebrates are lost from streams as their catchments become urbanised, as has recently been witnessed in the Avon River. Therefore, the Styx River may be regarded as being in a transitional state between a healthy rural stream and a less healthy urban stream (Suren, 2008).

9.2.6 Floodplains and ponding Areas

Floodplains and ponding areas occur naturally or as part of the constructed stormwater infrastructure network. Natural floodplains consist of low-lying areas adjacent to waterways and result from the movement of water from earlier storm events and the Waimakariri River. Natural ponding areas are hollows where the water will drain slowly away over time. Many of these areas contain drains that have been constructed to improve the drainage within these areas. Constructed ponding areas consist of retention basins and swales that provide water storage during storm events.

9.2.7 Groundwater and Springs

Groundwater, particular that associated with the upper aquifers, originates from seepage into the ground during storm events, irrigation, and underground flows from the Waimakariri River. It is released to the surface via springs and seepages, and provides approximately 80 percent of the base flow in the Styx River. As spring flows are dependent on groundwater levels and pressures, any interference /modification to groundwater is likely to impact on surface water values. This has recently occurred in the upper Kaputone Creek adjacent to the recent Northwood residential development. A dramatic loss in spring flow has required the installation of a well to reinstate water into this upper tributary of the Styx River system. There are a number of other springs within the Belfast area that will also be sensitive to land use activities and increasing urbanisation.

9.2.8 Water Quality

Water quality in the Styx River appeared to be good to excellent from a national perspective. Water in the Styx River had the lowest conductivity, lowest nitrate concentrations, lowest turbidity and total suspended solids, as well as the lowest pH of 83 urban streams throughout the country. In this sense, water quality of the Styx River was more similar to rural streams than either urban or semi-urban streams from a national basis. Good water quality of the Styx River most likely reflects its spring source and the fact that to date the catchment is still predominantly non-urban (Suren, 2008).

9.2.9 Aesthetic Values

The aesthetic values associated with particular landscapes refer to the capacity of a location to transmit a certain feeling of beauty, depending on the significance and cultural appreciation that it has acquired through history. It also refers to the intrinsic value of its colours, diversity, form, proportions, scale, texture and unity of the elements forming the landscape. The community values the Styx River and its environs for the wilderness values and sense of nature that are it provides.

As the Styx River catchment will become increasingly urbanised, and the natural character associated with its waterways and wetlands will need to be carefully managed. Degradation of natural character can be caused through the close proximity of buildings to waterways, loss of habitat and maintenance practices. There needs to be a conscious decision on how natural character will be addressed through landscape change associated with urbanisation. Possible measures include building setbacks, wide planted buffer zones and an understanding of what areas are considered conservation and what are considered amenity as this will influence maintenance practices.

9.2.10 Legibility

As the Styx River and associated waterways are the primary natural features within Belfast, they provide an important landmark, which enhances Belfast's legibility. For example, views from river crossings at Main North Road and Marshland Road, views of the river from Lower Styx Road, and the line of willow trees associated with the riparian margins that can be seen in the distant paddocks provide a clue to the location of waterways within the wider landscape and the relationship of people to it. The Styx River also provides an edge or physical boundary. This attribute is utilised to define and separate areas such as the suburbs of Redwood and Belfast. The creation of places of interest such as picnic areas and the pa harakeke (flax garden) will become nodes while walking tracks will provide another form of path through which people will come to understand their neighbourhood.

In urban environments, natural processes tend to become less visually apparent and subservient to the built environment, although they continue to occur. For example, tributary waterways and natural swales are replaced by stormwater infrastructure (e.g. piping); the open distant rural vistas of the Styx River and its tributary waterways will be lost through the construction of buildings; and landforms and natural drainage paths will be altered through the filling of low-lying areas and the creation of new drainage paths. With the inevitable change in land use in the catchment, consideration needs to be given to other ways of compensating for this loss in landscape legibility, particularly associated with the surface water environment. The planting of wide buffers containing large trees that grow above the height of surrounding buildings, public access along waterway margins, protection of significant views and vistas, particularly from road crossings and the use of open swales rather than pipes will assist in this process. Protecting and enhancing the attributes that increase landscape legibility will add to people's experience and appreciation of their locality and the Styx ecosystem.

9.2.11 Transient values

Transient landscape values include those landscape elements that occur for a short time. They include the presence of wildlife and people as they move through the landscape, vegetation changes associated with the seasons, the movement of water, and climatic changes reflected in the appearance of the sky and the intermittent presence of rain and the wind. An understanding of those transient landscape values that are considered important will enable these values to be protected and enhanced. For example, the presence of birds is important to the community. If birds are to be retained as a feature of the landscape, their habitats also need to be protected.

9.2.12 Shared values

Shared and recognised values consist of explicit and implicit beliefs, concepts and principles that underlie the culture of a community. With the development of the 'Styx Vision 2000 – 2040', there was extensive consultation with the community to identify common values, and issues of concern relating to the Styx River ecosystem. The process involved public events (e.g. Styx happening, workshops, bus trips), and focus group discussions with subgroups of the wider community (e.g. developers, farmers/growers, adjacent residents, high school students). The community agreed that it was important to protect the Styx River. There were, however, some differences in perceptions on what is meant by certain terms and the management of landscape change. These included the impact of development on the river system, access (public versus private rights), Council's role, vegetation species (native/exotic), and what is meant by the terms 'natural', 'wilderness', 'buffer zone/esplanade reserves.

9.2.13 Recreation

Increasing urbanization in the Belfast area provides an opportunity to set aside space for recreational activities at time of land use change. Waterways and wetlands have proven to be ideally suited for the development of linear parks that make use of strips of public land adjacent to them. These reserves can incorporate a range of features catering for recreational activities, such as walking. Other recreational

activities that such areas can support include cycleways, picnic areas, children's wild play areas, jetties for boating, and access for fishing. If well managed, they can also provide a contrasting nature experience within urbanised areas.

Although there is provision for the acquisition of open space in many instances it is insufficient to achieve the range of values identified in the City Plan or the 'Styx Vision 2000 – 2040'. One of the visions for the Styx is the development of a 'Source to Sea' walkway, extending from the source of the Styx River and associated tributary waterways through to Brooklands Lagoon. Council planning for the creation of such a walkway is not well advanced and requires significant land acquisition and the support of property owners and developers.

Personal safety is considered a key issue in managing public open space. Although there can be conflicts between this and ecological requirements, there are still opportunities to encourage safety through design. They include informal surveillance from surrounding property boundaries, encouragement of appropriate activities, frequent access points along with good signage highlighting exit points and walkway networks, wide pathways, and alternative pathways where it may not be considered safe.

9.2.14 Culture

Culture can be described as the shared, learned, and symbolic system of values, beliefs and attitudes that shapes and influences perception and behaviour. In terms of the waterways and wetlands associated with the Styx catchment, both Māori and European settlers have developed a relationship to these natural features.

For Māori, water is a taonga and represents the lifeblood of the environment. Māori ascribe absolute importance to water quality in relation to Mahinga kai (food gathering), hygiene and spiritual traditions. Waterways have been an abundant source of food, including eels, Piharau (lamprey), Mohoao (black flounder), Paraki (smelt), Inanga (whitebait), and possibly even Kokopu (giant kokopu), and Kanae (mullet). The importance of the river for food and traditional activities continues today, consequently the maintenance of water quality and quantity continues to be a paramount resource management issue for tangata whenua.

For early European settlers, the waterways and wetlands were used for recreation, access, and as a source of food. However, in order to develop the adjacent lands, draining wetland areas within the catchment and managing storm events associated with the waterways was essential. This resulted in extensive works by the former Christchurch Drainage Board in the deepening, widening and straightening of the Styx River and the construction of the floodgate near its mouth. A network of drains was also developed in the adjacent low-lying areas allowing these areas to be farmed.

Due to increased environmental awareness, the community values the Styx River and associated waterways for their perceived natural and recreational values as well as the need to continue with good drainage. Protecting these values, including public access, are key concerns, particularly with the anticipated urbanization in the catchment.

9.2.15 Heritage

The history and location of Christchurch have given it a distinctive character, much of which is derived from the values associated with heritage places. The area was important to Māori as a food gathering area, a source of resources and for burial activities. A traditional walkway traveling north to south also passed through Belfast. For the early and later non-Māori and European communities, the waterways within the catchment were utilized for rural and industrial activities (e.g. flax mills, freezing works, and food production). These activities went on to make a significant contribution to the history of Christchurch and Canterbury. Heritage features that are important to Māori and non-Māori and which have a relationship to waterways and wetlands in the Styx catchment include the following:

- Middens at Janet Stewart Reserve, off Lower Styx Road;
- Buildings associated with the meat works site adjacent to Kaputone Creek off factory Road;
- Factory gardens and built structures associated with the meat works site adjacent to Kaputone Creek off Factory Road;
- Managers House and associated gardens adjacent to Kaputone Creek off Blakes Road;
- Engineers House and associated gardens adjacent to Kaputone Creek off Blakes Road;
- Building remains adjacent to Kaputone Creek off Blakes Road;
- Ouruhia Reserve off Guthries Road;
- Heritage Orchard adjacent to Kaputone Creek at 479 Marshland Road;
- Farm buildings adjacent to Styx River at 303 Radcliffe Road;
- Ash Tree adjacent to Styx River at Janet Stewart Reserve;
- Hedgerows at 303 Radcliffe Road.

9.3 Issues

A number of issues have arisen in relation to the implementation of the Styx Vision 2000 – 2040 and the increasing urbanisation of Belfast, which include the following:

- Reduction in the quality of water entering waterways
- Loss of groundwater feeding spring flows
- Alteration of groundwater path flows
- Maintaining the natural functioning and character of waterways
- Protecting the capacity of waterways, secondary flow paths and ponding areas that are essential during storm events
- The council is developing an integrated catchment management plan (ICMP) for the Styx Catchment, which will focus on improving stormwater quality. There is, however, no requirement for developers of smaller subdivisions (less than 29) to adopt ICMP principles.
- The dynamic nature of waterways needs to be reflected in urban development. Changes to the nature of waterways can be brought about by such things as climatic conditions, land cover, and activities within the waterway itself (e.g. boating). As areas become urbanised, people seek to constrain waterways in order to maximise development opportunities. This can result in hard bank works and loss of natural character. Hard bank works have a finite life cycle and in time will require replacement and this incur additional ongoing costs. Providing space for the natural movement of waterways, along with protecting natural floodplains and bank profiles will not only retain and protect natural character, but will be move cost effective in the long term.
- The Styx catchment is undergoing rapid land use change. Opportunities for the acquisition of buffer zones and the protection and enhancement of values can occur through this process, a dynamic process generally driven by landowners and developers. If not managed properly, it can, however, be a time when many values are lost forever.
- Although the 'Styx Vision 2000 – 2040' has been adopted by Council, there is a lack of detail associated with the protection, development and management of waterways and wetlands within the catchment. The reasons for this are as follows:
    - It was important to obtain community support for the Vision rather than be caught up in private property issues;
    - Acquiring green buffers alongside waterways within the Styx catchment is heavily influenced by private landowners' aspirations and intentions, which required further consultation once the vision was adopted;
    - In some situations, there was a lack of knowledge, which required further investigations.

- There is a lack of clarity between the Resource Management Act and the Local Government Act in terms of land use change, particularly associated with natural assets.
- A number of statutory and non-statutory processes are occurring concurrently within Council that impact on the outcomes associated with achieving the 'Styx Vision 2000 – 2040'. They include the development of the Belfast Area Plan, Styx Integrated Management Catchment Plan, and Private Plan Changes.
- The 'Styx Vision 2000 – 2040' is a holistic perspective based on values and is greater than the sum of its parts. It cannot be considered as isolated components but needs to be viewed in terms of how these values are integrated into the development and management of assets that form the landscape.

9.4 The Styx Vision

The 'Styx Vision 2000 – 2040' was developed in partnership with the community and evolved largely from the policies in the City Plan and the Waterways and Wetlands Asset Management Strategy. The overall vision includes five inter-related visions along with a series of key actions for their implementation. The visions are as follows:

Vision 1: To achieve a viable spring-fed River Ecosystem to complement the other representative protected ecosystems of Christchurch such as the Port Hills, Travis Wetlands and the coastline;

Vision 2: To create a 'Source to Sea' experience through the development of an Urban National Reserve;

Vision 3: To develop a living laboratory that focuses on both learning and research as envisioned by Dr Leonard Cockayne;

Vision 4: To establish the Styx as a place to be through maintaining and enhancing the special character and identity of the area;

Vision 5: To foster partnerships through raising the quality of relationships as we move forward together.

The vision was adopted by Council in July 2001 and is gradually being implemented through the activities of the Council, the community and other government and non-governmental organisations. Tasks to date include land protection, habitat restoration, community monitoring programmes, research projects (Summer Student Research Placements, Royal Society Teacher Fellowships), and the development of public infrastructure (bridges, paths, signage etc.).

9.5 Styx Vision Priorities

The community vision for the Styx catchment known as the Styx Vision 2000 – 2040 was planned to be implemented over a forty-year period. It is anticipated that there will there will be a rapid increase in land use change associated with Greenfield developments within the catchment over the next ten years. Although this may mean the Styx Vision has to be implemented more rapidly than anticipated, it will also stretch Council's ability to fund the wider public good associated with the vision, a community responsibility rather than that of developers. Possible locations for storm water infrastructure associated with the Belfast Growth Area are indicated. These sites will require more on site analysis and are indicative only. As these are a requirement of development, they have not been included in the priority list. The following priorities are listed in order from greatest priority to lesser priority.

- Protecting land associated with existing ecological sites and habitats, proposed buffer zones and natural character such as existing river terraces alongside waterways and wetlands;
- Protecting and maintaining cultural heritage sites/places/structures;
- Protecting public access and development of walking tracks and associated directional signage alongside waterways and wetlands;
- Habitat restoration;
- Amenity development (jetties, seating, car parks, interpretation).

9.6 Sites of Significance

The following table provides additional information on significant sites related to the Styx Vision within the Belfast area. Although much of the Council's planning work is associated with accommodating urban growth within Belfast, consideration also needs to be given to the wider catchment and the downstream effects of urban development. See appendix for maps of significant sites associated with the Styx Vision.

Site Name/Location	Description	Perceived value 1 – High 5 – Low	Statutory Protection	Issues	Recommended actions	Preferred mechanisms	Responsibility	Approximate costs	
								Capital expenditure	Operational expenditure
Land protection									
Styx River Gardiners Rd to Main North Rd	Section C,1,2,3,4,7,8,9,10,11,12,13	1	Nil	There is currently a lack of buffer protection along this area of the Styx. Protection is also required for the high ecological values in the area.	Zoning, esplanade reserve, development contributions, environmental compensation, land purchase at rural rates, building setbacks	Combination needed	CCC	$10,735,200	Grazing at minimal cost
Styx River Main North Rd to railway line	Section D,5,8,10	1	Nil	There is a lack of existing protection for natural character and flood plains. There is also a need to provide more of a buffer to support ecological values.	Zoning, esplanade reserve, development contributions, environmental compensation, land purchase at rural rates, building setbacks	Combination needed	CCC	$2,812,050	Grazing at minimal cost
Styx River Main North Rd to railway line	Section D, 1,2,3,4	2	Nil	There is a need to protect ecological values and natural character in this area.	Esplanade reserve, building setbacks	Combination needed	CCC	Nil	Grazing at minimal cost
Styx River Railway line to motorway designation	Section D, 11, 12, 13	1	Nil	There is a need for an increase in land for the purposes of stormwater infrastructure. It is also important to integrate detention areas with native plantings as a means of increasing habitat in the area. Additionally, this land would also be useful for the creation of a walkway.	Zoning, esplanade reserve, development contributions, environmental compensation, land purchase at rural rates, building setbacks	Combination needed	CCC	$5,953,500	Grazing at minimal cost
Kaputone Creek Johns Rd to Main North Rd	Section J, 4, 5,6,7,8, 9 13	1	Nil	There is currently insufficient protection for ecological values, and a lack of walkway access.	Zoning, esplanade reserve, development contributions, environmental compensation, land purchase at rural rates, building setbacks	Combination needed	CCC	$2466,000	Maintenance of existing trees and grass
Kaputone Creek Main North Rd to motorway designation	Section I,34,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50, 51,52,53,54,55,56,57	1	Nil	There is a need to create an ecological buffer zone, walkways and to protect natural character in this area.	Zoning, development contributions, environmental compensation, land purchase at rural rates, building setbacks	Combination needed	CCC	$15,599,850	Grazing at minimal cost
Smacks Creek Source to confluence with Styx River	Section K1	2	Nil	There is currently no protection for natural values in this area. There is also a need for the protection of natural character, the creation of walkways and the development of a circular route connecting with the Styx River.	Zoning, development contributions, environmental compensation, land purchase at rural rates, building setbacks	Combination needed	CCC	$307,800	Grazing at minimal cost Plus Maintenance of existing trees and grass through mowing

Smacks Creek Source to confluence with Styx River	Section K,2,3,4,5,6.7.8.9,10,11,12,13,14,15,16	1	Nil	There is significant degradation in this area and a lack of protection for existing habitat.	Zoning, development contributions, environmental compensation, land purchase at rural rates, building setbacks	Combination needed	CCC	$6,008,850	Grazing at minimal cost and maintenance of existing trees and grass through mowing
Reserve Development (Does not include the development of land currently in council ownership)									
Styx River Gardiners Rd to Main North Rd C,1,2,3,4,7,8,9,10,11,12,13	Public access 3 new bridges and new pathways	3	Nil	There is a need to develop a souice to sea walkway along this section of the Styx and increase access to Styx Mill reserve.	Capital works programme. For the walkways, may also use people on government work schemes (PDP) or community volunteers (e.g. service organisations)		CCC	$373,000.00	To be determined
	Habitat restoration New areas for habitat restoration	4	Nil	Much of this area is currently in pasture, and there is a need to recreate viable habitat in this area.	Capital works programme, community volunteers, schools, work experience (e.g. Lincoln University)	Combination needed	CCC	$1,341,530.00	$183,000.00 decreasing to $46,000 over five years
	Amenity development Includes Car parking, fencing, pest-proof fencing and entry features/interpretation and specimen tree planting.	5	Nil	The current Styx Vision concept has not been implemented in this area, and more work is needed to ensure that this vision is achieved.	Capital works programme	Capital works programme	CCC	$319,700.00	To be determined
Styx River Main North Rd to railway line D,5,8,10	Public access 1 bridge and new walking track	3	Nil	There is an existing lack of access across the railway line in this area.	Capital works programme. For the walkways, may also use people on government work schemes (PDP) or community volunteers (e.g. service organisations)	Combination needed	CCC	$234,000.00	To be determined
	Habitat restoration Land for habitat restoration	4	Nil	There is a need to develop the land in this area for the purposes of forming a functional green corridor to support ecological values.	Capital works programme, community volunteers, schools, work experience (e.g. Lincoln University)	Combination needed	CCC	$369,250.00	$52,000.00 decreasing to $13,000.00 over five years
	Amenity development	5	Nil	This area requires some seating, walkway development and possible interpretation to improve amenity.	Capital works programme	Capital works programme	CCC	$127,100.00	To be determined
Styx River Main North Rd to railway line D1,2,3,4	Public access Limited access provided for adjacent properties	3	Nil	There is a lack of public access associated with this site, and there is potential for the development of a walking corridor.	Capital works programme.	Capital works programme	CCC	$13,100.00	To be determined
	Habitat restoration	4	Nil	There is currently a lack of viable habitat in this area, which is dominated by pasture.	Capital works programme, local resident volunteers,	Combination needed	CCC	$30,390.00	$8500.00 decreasing to $2100.00 over five years

	Amenity development	5	Nil	This area requires some seating, walkway development and possible interpretation to improve amenity.	Capital works programme	Capital works programme	CCC	$37,000.00	To be determined
Styx River Railway line to motorway designation D,11,12,13	Public access Pedestrian bridge part of new motorway bridge and new walkways.	3	Nil	There is currently a lack of walking access associated with this area.	Capital works programme. For the walkways, may also use people on government work schemes (PDP) or community volunteers (eg service organisations)	Combination needed	CCC	$127,000.00	To be determined
	Habitat restoration New land for habitat areas	4	Nil	There is currently a lack of native planting and an abundance of pasture associated with this site. Thus, there is very little viable habitat associated with this area.	Capital works programme, community volunteers, schools, work experience (e.g. Lincoln University)	Combination needed	CCC	$407,000.00	$83,000.00 decreasing to $21000.00 over five years
	Amenity development Includes entry features and interpretation	5	Nil	This area requires seating and interpretation for detention basins.	Capital works programme	Capital works programme	CCC	$6000.00	To be determined
Kaputone Creek Johns Rd to Main North Rd J,4,5,6,8, 9 13	Public access	3	Nil	There is currently a lack of public access associated with this site. There are opportunities for creating a source to sea walkway.	Capital works programme.	Capital works programme	CCC	No info	To be determined
	Habitat restoration Land for new habitat areas	4	Nil	There is a lack of habitat associated with this site, and exotic plantings dominate.	Capital works programme, community volunteers, schools, work experience (e.g. Lincoln University)	Combination needed	CCC	No info	To be determined
	Amenity development	5	Nil	This area requires some seating,	Capital works programme	Capital	CCC	No info	To be
	Amenity development	5	Nil	This area requires some seating, walkway development and possible interpretation to improve amenity.	Capital works programme	Capital works programme	CCC	No info	To be determined
Kaputone Creek Main North Rd to motorway designation Section I I,34,36,37,38,39,40,41,42,43,44,45,46, 47,48,49,50,51,52,53,54,55,56,57	Heritage protection Includes historic homestead, factory gardens, shelterbelts, and built structures and remnants	2	Nil	There is a lack of protection for heritage items and places associated with this site.	Develop a maintenance programme for heritage features and implement.		CCC	N/A	To be determined
	Public access	3	Nil	There is a lack of public access along Kaputone in this area.	Capital works programme.	3	CCC	$971,000.00	To be determined
	Habitat restoration	4	Nil	There is a lack of habitat protection in this area.	Capital works programme, community volunteers, schools, work experience (e.g. Lincoln University)	4	CCC and partnerships	$2,985,000.00	$1,000,000.00 decreasing to $100,000 over five years
	Amenity development	5	Nil	This area requires some seating, walkway development and possible interpretation to improve amenity.	Capital works programme	5	CCC	$291,000.00	To be determined
Smacks Creek Section K K1,2,3,4,5,6.7.8.9,10,11,12, 13, 14, 15, 16	Heritage protection Water wheel	2	Nil	There is currently a lack of protection for the water wheel.	Develop a maintenance programme for heritage features and implement.	Operations Maintenance programme	CCC	Didn't know about this	To be determined
	Public access	3	Nil	Some access is available in areas near the crematorium, but public access is generally poor.	Capital works programme. For the walkways, may also use people on government work schemes (PDP) or community volunteers (e.g. service	Combination needed	CCC	$188,900.00	To be determined

					organisations)				
	Habitat restoration	4	Nil	There is a lack of viable habitat in this area.	Capital works programme, community volunteers, schools, work experience (e.g. Lincoln University)	Combination needed	CCC	$438,570.00	$60,200.00 decreasing to $6400.00 over five years
	Amenity development	5	Nil	This area requires some seating, walkway development and possible interpretation to improve amenity.	Capital works programme	Capital works programme	CCC	$102,000.00	To be determined

10. The Greenprint for Belfast

10.1 Greenprint Visions

10.1.1 Natural values vision
To Maintain and enhance the quality and quantity of Belfast's natural values and local ecosystems through the protection, enhancement and restoration of geology and soils, water and wetlands, flora and fauna.

10.1.2 Heritage vision
To promote the values and features of Belfast's heritage (including elements that have historical and social significance, cultural and spiritual significance, architectural and artistic significance, group and setting significance, landmark significance, archaeological significance, and technology and craftsmanship significance) and to protect and conserve places of historical and cultural heritage importance.

10.1.3 Tangata whenua vision
To promote and develop Māori cultural heritage within Belfast and conserve and restore places of cultural importance.

10.1.4 Landscape vision
To retain Belfast's landscape character at the interface between its rural/urban boundary, and to achieve a high level of visual amenity and natural character as the township develops.

10.1.5 Recreation and open space vision
To facilitate and provide the following through the growth and development of Belfast:

- Accessible and interconnected open spaces;
- Diversity in the function, type and size of open spaces to meet local needs, including the provision of district and regional needs where appropriate; and
- A diversity of facilities and recreational opportunities that meet local needs and capitalise upon the environmental attributes of the area.

10.1.6 Surface and groundwater vision
To manage increased runoff and the disposal of stormwater because of land use change in the Belfast area in a manner that protects, maintains and enhances:
(a) The quality and availability of Belfast's surface- and ground-water resources;
(b) Natural values;
(c) Amenity values;
(d) Public accessibility of waterways and their margins.

10.1.7 The Styx Vision

Styx vision 1
To achieve a viable spring-fed river ecosystem to complement the other representative protected ecosystems of Christchurch, such as the Port Hills, Travis Wetland and the coastline.

Styx vision 2
To create a 'source to sea' experience through the development an urban national reserve.

Styx vision 3
To develop a living laboratory that focuses on both learning and research.

Styx vision 4
To establish the Styx as a place to be through maintaining and enhancing the special character and identity of the area.

10.2 Greenprint priorities
The priorities presented in the table and map below have been developed out of a number of considerations:

Perceived value refers to a general assessment of the importance of sites in Belfast as determined by expert researchers in the preparation of background documents to the Greenprint. This assessment also relates to feedback received from the Belfast community during previous consultation exercises. Only those sites identified in the earlier sections of this report as having a high priority (that is, a priority score of one, two or three) are utilised in this analysis. This should not be inferred as an absence of the need for action in relation the other sites identified in this report (sites with a perceived value rating of four or five). Rather, actions to secure these sites is not regarded as a key requirement in the application of the Belfast Area Plan, and other mechanisms such as education, conservation covenants, for example, may perhaps be used in the first instance to secure such values.

Significance relates to an assessment of the perceived value (above) and statutory requirements associated with the actions to be undertaken in relation to each of the sites (especially in terms of Part 2 of the Resource Management Act as being necessary for the sustainable management of natural and physical resources). Consideration has also been given to the statutory duties of the council under the Local Government Act 2002 and other relevant Statutes such as the Reserves Act (1977) and requirements to protect areas that are critical to the functioning of the city. Each site is assigned a level of significance whereby a value of 'critical' indicates a high level of significance and statutory prominence, and 'desirable' indicates a comparatively low level of significance.

Timescale reflects the likely timing of required actions for each site to ensure that protection or enhancement measures are effectively implemented during the development of the Belfast area. Timing is separated into five categories: present (0-3yrs), short term (3 – 6 yrs), medium term (6-10yrs), long term (10-23 years) and future terms (23yrs+). The timing is based on the likelihood of change (urban development) as determined by reference to Table 2 'Development Sequencing for Greater Christchurch 2007 – 2041' as notified through Change 1 to the Canterbury Regional Policy Statement (as amended by Variation 1).

Final Priority is based on a consideration of both the significance of the site and the timescale, as is outlined in Table 2 below. A site that has a high level of significance and requires present action would have the highest priority (a score of 19), while a site that has a low level of significance and does not require immediate action would have the lowest priority. The table below and the subsequent integration map identify the most significant sites for Belfast, which require protection and/or enhancement in the face of urban development.

Table 2: Methodology for determining Priority

Timescale	Categorisation		
	Critical (10)	Important (6)	Desirable (1)
3yrs (9)	19	15	10
6yrs (7)	17	13	8
10yrs (3)	13	9	4
23yrs (1)	11	7	2

Priority Categories:

- Low priority for action – Scores 1 to 8
- Medium priority for action – Scores 9 to 11
- High priority for action – Scores 12 to 19

10.3 Priorities for Belfast

The following table identifies the priority locations, which will require maintenance, protection or enhancement in the face of urban development and through the implementation of the Belfast Area Plan. Locations are ordered from highest to lowest priority.

Map #	Site/Location	Perceived value (1 = high, 5 = low)						Significance (perceived and statutory)	Timescale	Priority (19 = highest, 2 = lowest)
		Natural (Chapter 3)	Heritage (Chapter 4)	Landscape (Chapter 5)	Recreation/ community (Chapter 6)	Surface/ groundwater (Chapter 7)	Styx Vision (Chapter 8)			
1	The Styx River	1 (# 1[7])	2 (#33)	1 (#8)	1 (#9)	1 (#1)	1 (C & D)	Critical	3yrs	**19**
2	Kaputone Stream	1 (#3)	2 (#35)	1 (#8)	1 (#9)	1 (#2)	1 (I & J)	Critical	3yrs	**19**
3	Wāhi tapu and Taonga (including silent files)	-	1 (#28)	-	-	-	-	Critical	3yrs	**19**
4	Rural/urban boundary	-	-	1 (#2)	-	-	-	Critical	3yrs	**19**
5	Kaiapoi Bridge sub-catchment	-	-	-	-	1 (#6)	-	Critical	3yrs	**19**
6	Kainga sub-cathment	-	-	-	-	1 (#7)	-	Critical	3yrs	**19**
7	Lower Wilsons sub-catchment	-	-	-	-	1 (#8)	-	Critical	3yrs	**19**
8	Upper Kaputone sub-catchment	-	-	-	-	1 (#9)	-	Critical	3yrs	**19**
9	Lower Kaputone sub-catchment	-	-	-	-	1 (#10)	-	Critical	3yrs	**19**
10	Radcliffe sub-catchment	-	-	-	-	1 (#17)	-	Critical	3yrs	**19**
11	Integrated stormwater treatment systems	-	-	2 (#11)	-	-	-	Critical	3yrs	**19**
12	Cycleways and walkways	-	-	-	2 (#10)	-	-	Critical	3yrs	**19**
13	Styx North/Radcliffe North connection	-	-	-	2 (#25)	-	-	Critical	3yrs	**19**
14	Otukaikino reserve	4 (#6)	1 (#30)	1 (#9)	2 (#6)	-	-	Critical	6yrs	**17**
15	Natural Springs	-	3 (#37)	-	-	2 (#4)	-	Critical	6yrs	**17**
16	Proposed reserve/open space areas	1 (#11)	-	-	1 (#19)	-	-	Important	3yrs	**15**
17	The Styx Over bridge	-	-	2 (#14)	2 (#22)	-	-	Important	3yrs	**15**
18	The Belfast Community Network	-	-	-	2 (#18)	-	-	Important	3yrs	**15**
19	Kapuatohe Reserve	-	1 (#7)	1 (#9)	-	-	-	Important	6yrs	**13**
20	Sheldon Park	-	1 (#20)	1 (#9)	1 (#2)	-	-	Important	6yrs	**13**
21	Proposed northern arterial	3 (#16)	-	2 (#16)	1 (#8)	-	-	Critical	10yrs	**13**
22	Proposed western bypass	5 (#17)	-	-	1 (#8)	-	-	Critical	10yrs	**13**
23	Industrial/urban interface	-	-	2 (#3)	-	-	-	Important	6yrs	**13**
24	Urban/open space and waterway interface	-	-	3 (#4)	-	-	-	Important	6yrs	**13**
25	Urban/transport corridor interface	-	-	3 (#5)	-	-	-	Important	6yrs	**13**
26	New living zones	-	-	3 (#6)	-	-	-	Important	6yrs	**13**
27	New business zones	-	-	3 (#7)	-	-	-	Important	6yrs	**13**
28	Wilson's and John's Drains	-	-	-	-	3 (#5)	-	Important	6yrs	**13**
29	Smacks Creek	3 (#2)	2 (#34)	1 (#8)	1 (#9)	1 (#3)	1 (K)	Critical	23yrs	**11**
30	Section 293 land (Applefields/Devondale)	-	-	2 (#17)	1 (#23)	1 (#13)	-	Desirable	3yrs	**10**
31	Main North Road	-	-	3 (#12)	1 (#8)	-	-	Important	10yrs	**9**
32	Johns Road	-	-	4 (#13)	1 (#8)	-	-	Important	10yrs	**9**
33	Libraries	-	-	-	2 (#13)	-	-	Important	10yrs	**9**
34	Educational Centres	-	-	-	2 (#15)	-	-	Important	10yrs	**9**
35	John's sub-catchment	-	-	-	-	2 (#11)	-	Important	10yrs	**9**
36	Rushmore sub-catchment	-	-	-	-	2 (#12)	-	Important	10yrs	**9**
37	Styx Mill sub-catchment	-	-	-	-	1 (#15)	-	Important	10yrs	**9**
38	Hussey sub-catchment	-	-	-	-	1 (#16)	-	Important	10yrs	**9**
39	Listed trees	-	3 (#13)	3 (#10)	-	-	-	Important	10yrs	**9**

[7] Numbers/letters in parentheses refers to individual chapter maps and tables presented earlier in this document.

Map #	Site/Location	Perceived value (1 = high, 5 = low)						Significance (perceived and statutory)	Timescale	Priority (19 = highest, 2 = lowest)
		Natural (Chapter 3)	Heritage (Chapter 4)	Landscape (Chapter 5)	Recreation/ community (Chapter 6)	Surface/ groundwater (Chapter 7)	Styx Vision (Chapter 8)			
40	Local/community parks	-	-	-	1 (#1)	-	-	Important	10yrs	**9**
41	Freezing Works (Canterbury Frozen Meats)	-	1 (#1)	-	-	-	-	Desirable	6yrs	**8**
42	Older business and industrial zones	-	-	3 (#19)	-	-	-	Desirable	6yrs	**8**
43	The South Branch of the Waimakariri (Otukaikino River)	4 (#4)	2 (#36)	1 (#8)	1 (#9)	-	-	Important	23yrs	**7**
44	Railway corridor	3 (#18)	-	3 (#15)	1 (#8)	-	-	Important	23yrs	**7**
45	Styx Mill Conservation reserve	1 (#5)	2 (#32)	1 (#9)	1 (#5)	-	-	Important	23yrs	**7**
46	The Groynes	1 (#26)	-	-	1(#26)	-	-	Desirable	10yrs	**4**
47	McLeans Island War Memorial	-	1 (#3)	-	-	-	-	Desirable	10yrs	**4**
48	Kaputone Wool Scouring works	-	1 (#5)	-	-	-	-	Desirable	10yrs	**4**
49	Sheldon Park war memorial	-	1 (#6)	-	-	-	-	Desirable	10yrs	**4**
50	Belfast Historic School house	-	1 (#8)	-	-	-	-	Desirable	10yrs	**4**
51	Crofter's cottage	-	1 (#9)	-	-	-	-	Desirable	10yrs	**4**
52	St David's Church	-	1 (#10)	-	-	-	-	Desirable	10yrs	**4**
53	Spring Grove	-	1 (#11)	-	-	-	-	Desirable	10yrs	**4**
54	Belfast Cemetery	-	1 (#12)	-	-	-	-	Desirable	10yrs	**4**
55	Brick Villa (20 Blakes Road)	-	1 (#15)	-	-	-	-	Desirable	10yrs	**4**
56	Scanes store	-	1 (#21)	-	-	-	-	Desirable	10yrs	**4**
57	Freezing works (Brothworks site)	-	1 (#22)	-	-	-	-	Desirable	6yrs	**4**
58	51 Hussey Road (Redwood Aquatics)	3 (#7)	-	-	-	-	-	Desirable	10yrs	**4**
59	7 Mile Peg	-	3 (#2)	-	-	-	-	Desirable	10yrs	**4**
60	7 Mile Peg Hotel	-	3 (#4)	-	-	-	-	Desirable	10yrs	**4**
61	Stone fence and entrance gate to Sheldon Park	-	3 (#14)	-	-	-	-	Desirable	10yrs	**4**
62	Pataka fruit shed	-	3 (#16)	-	-	-	-	Desirable	10yrs	**4**
63	Presbyterian Church	-	3 (#23)	-	-	-	-	Desirable	10yrs	**4**
64	Belfast School	-	3 (#24)	-	-	-	-	Desirable	10yrs	**4**
65	Main North Road	-	3 (#29)	-	-	-	-	Desirable	10yrs	**4**
66	PPCS land	-	-	-	3 (#24)	-	-	Desirable	10yrs	**4**
67	Aquatic facilities	-	-	-	3 (#20)	-	-	Desirable	23yrs	**2**
68	Redwood springs sub-catchment	-	-	-	-	3 (#18)	-	Desirable	23yrs	**2**
69	Mundys sub-catchment	-	-	-	-	3 (#19)	-	Desirable	23yrs	**2**

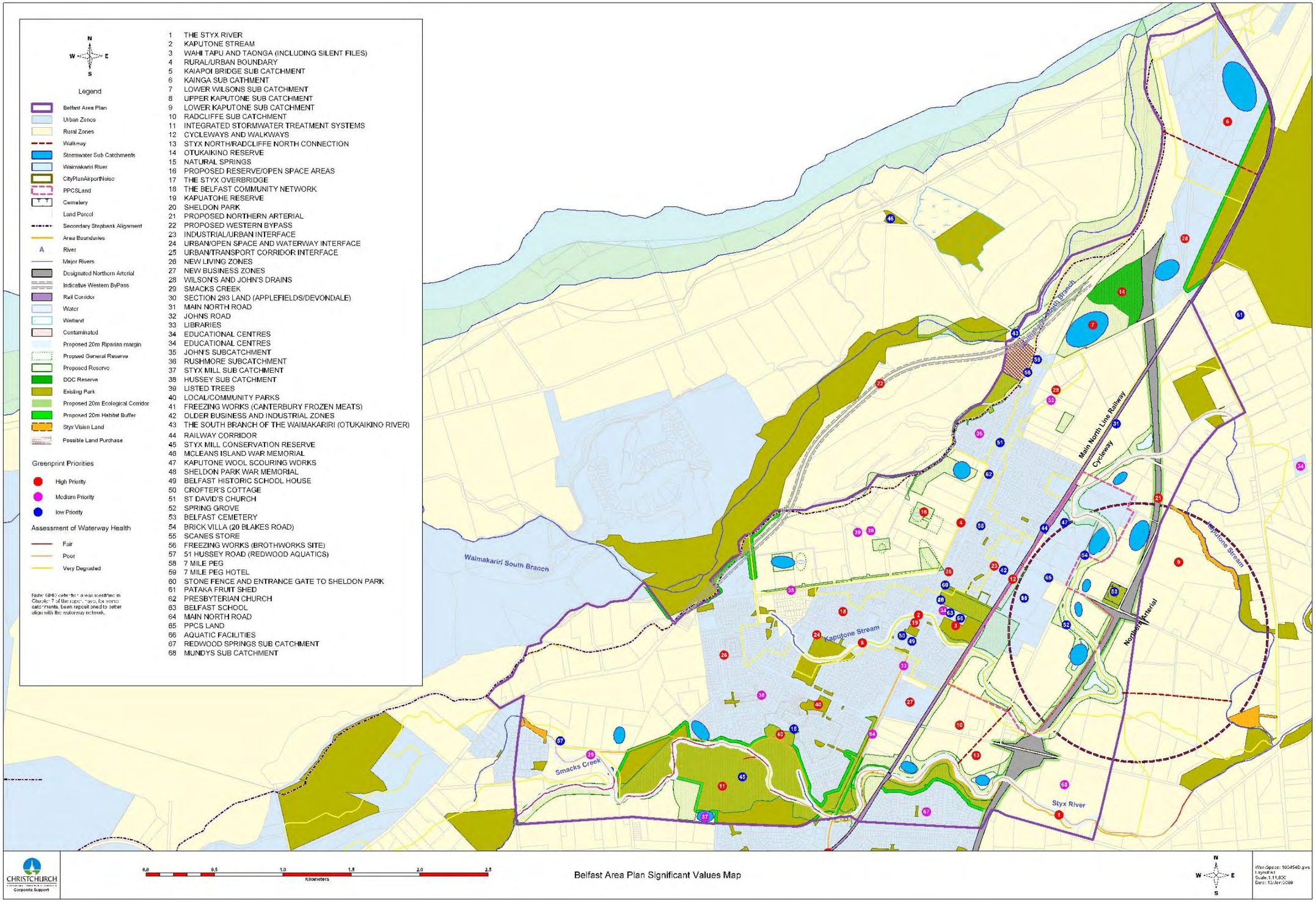
10.4 High priority sites

The highest priorities for the Belfast area are outlined below. Each of these locations will require careful consideration and provision in the coming years as the Belfast Area Plan is implemented.

Score	Area / Site	Details
19	**Styx River**	The margins of the Styx River maintain and enhance the ecological and natural values of the area, manage stormwater for adjoining developments, and promote recreation and community access to the waterway. There is a present to short-term threat from urban encroachment into the margins of this waterway.
19	**Kaputone Stream**	The margins of the Kaputone Stream have the ability to maintain and enhance the ecological and natural values of the area, manage stormwater for adjoining developments, and promote recreation and community access to the waterway. Currently, the Kaputone adjoins a number of historic industrial land uses to the north east of Belfast. There is a present to short-term threat from urban encroachment and unmanaged industrial run-off into the margins of this waterway.
19	**Wāhi Tapu and Taonga (including Silent Files)**	The cultural effects identified in this report are the very matters that all persons exercising functions and powers under the Resource Management Act shall recognise and provide for, namely "the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga (Section 6e). Particular regard should be given to kaitiakitanga, and the principles of the Treaty of Waitangi. The effects on Māori through the implementation of this Greenprint and the associated Area Plan, as informed by the relevant statutory provisions, need to be carefully weighed against any public benefit from development where an issue of cultural importance is identified. Of particular importance is the existence of a silent file within the Belfast area.
19	**Rural/Urban Boundary**	The Christchurch City Plan identifies the importance of clearly demarcating the rural/urban boundary in areas where development occurs. The intention is to establish a clear outer edge to the urban area that discourages urban sprawl. Boundaries for the Belfast Area are likely to include the Northern and Western Bypass routes, as well as geographical features such as the Styx River, Styx Mill Reserve and the Groynes.
19	**Cycleways and Walkways**	There is no specific site allocated for these, but their provision is predetermined by the standards espoused in the 2006 to 2016 LTCCP. Such areas are a defining factor in providing high amenity, healthy and sustainable communities. Critically, they can improve non-motorised accessibility in the area, and provide linkages and connections between reserves and living areas.
19	**Sub-Catchments – Radcliffe, Kaiapoi Bridge, Kainga, Lower Wilsons, Upper Kaputone, Lower Kaputone, Styx North / Radcliffe North**	The stormwater management mechanisms employed in these sub-catchments (in conjunction with the Integrated Stormwater Treatment System are paramount to ensuring that the adverse environmental effects of development are avoided or mitigated and that the natural resources of the area are sustained to meet the reasonably foreseeable needs of future generations. As such, these are pre-requisites for achieving sustainable management of the area through the implementation of the Area Plan.
19	**Integrated Stormwater Treatment Systems.**	
17	**Otukaikino Reserve**	The Otukaikino Reserve extension to the south of the existing reserve provides not only for the enhancement of a significant natural values asset in the area, but also provides substantial recreational and cultural values to the area. Its protection would provide a natural entrance into the Belfast settlement, and in combination with the 'Lower Wilsons' sub-catchment area provide suitable benefits for stormwater management.
17	**Natural springs**	Given the spring fed nature of the waterways in the area, it is critically important to ensure that the base-flow supporting the springs, as well as their hydrological and ecological connections, are managed and enhanced.
15	**Proposed reserve/open space areas**	There is no specific site allocated for these areas, but there provision is predetermined by the standards espoused in the 2006 to 2016 LTCCP. Such areas are a defining factor in providing high amenity, healthy and sustainable communities.
15	**The Belfast Community Network**	Whilst not of a critical importance in terms of sustaining development in the area, the 'Network', which supports social cohesion and community outcomes in the area, requires a new facility from which to operate within the short term.
13	**Kapuatohe Reserve**	Whilst already in Council ownership, this reserve and the associated School House and Crofter's cottage are perhaps the most visible and best linkage to Belfast's history. The sites listing with the Historic Places Trust also underlines its importance. Actions for the review of the Management Plan should be undertaken within the next 6 years.
13	**Sheldon Park Extension**	Given a projected population increase in the order of 10,000 people identified to 2026 in the Belfast Area, the extension of active sports fields is a pre-requisite. The Sheldon Park expansion, to the east of the railway line, would provide for the efficient use of facilities already at Sheldon Park, including the Rugby Clubrooms. Issues of connectivity across the Main Trunk Rail corridor will need to be overcome.
13	**Proposed Northern Arterial**	This arterial, designated since the 1960s, is likely to be developed within the next 10 years. The route will provide a hard edge to the east of Belfast and will transect the Kaputone Creek at three intervals. As such, it will be extremely important to ensure that the ecological and amenity implications of the Northern Arterial are considered.
13	**Proposed Western Bypass**	This proposed arterial has not been designated, nor a final route selected, although it is likely to be developed between the Groynes and land identified as the Applefields / Devondale block. The route will have an ecological and amenity impact on the immediate area, and provide an opportunity for

		additional reserves adjacent to the Groynes and newly developed residential areas.
13	**Urban / open space and waterway interface**	The urban/open space interface is important in terms of the provision of an effective buffer with urban activity, but also providing for stormwater management as may be necessary. Within the Belfast areas, 20m is considered a minimum buffer width; although for waterways, such as the Styx River, additional buffering may be required given its regional significance and stormwater management role.
13	**Urban / Transport Corridor interface**	It will be important that a suitable buffer (some 80m without mitigation) is provided between noise sensitive activities (such as living zones) and the proposed Western and Northern Motorways. This will also provide some potential for recreational and stormwater areas, as well as walkways and cycleway access between living areas.
13	**New Living Zones**	Consolidated residential densities of approximately 15 households per hectare will be required to achieve the requirements of Change 1 to the Regional Policy Statement. These will mainly be stand-alone, detached dwellings with smaller sites and more compact duplex and terraced housing at appropriate locations related to neighbour centres, areas of open space, and the movement network.
13	**New Business Zones**	New Business zones refer to areas within Belfast where significant commercial developments are anticipated. These areas will predominantly consist of one to two level retail, commercial and leisure activities, associated with the existing Supa Centa commercial infrastructure. The area should be well integrated with the transport network (both motorised and non-motorised with the living zones of the area.

10.5 Greenprint map



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Glossary

Area Plan: A written document made up of maps, drawings and other information that provide a broad framework for guiding future land use change, particularly in new urban growth areas

Building setbacks: Municipal ordinance stating the distance from a curb or property line where a building can be located.

Blueprint: A document that outlines the constructed and natural surface water management system

Covenant: A formal agreement between the local authority and a private landowner which will permits or restricts certain actions.

Crime Prevention Through Environmental Design (CPTED): A crime prevention philosophy based on proper design and effective use of the build environment.

Designation: A provision made in a district plan to give effect to a requirement made by a requiring authority under section 168 of the Resource Management Act 1991.

Development contribution: A contribution from developers of cash and/or land to fund the additional demand for community facilities created as a result of growth.

Easement: The legal right to use private property.

Esplanade Reserve/strip: A fixed linear area of riverbank, lakeshore or seashore either in a natural or modified state available primarily for conservation and public access.

Environmental compensation: A technique used by central and local government under resource management legislation, which seeks to remedy the loss of environmental resources resulting from activities with adverse effects.

First flush: The washing action that stormwater has on accumulated pollutants. The first runoff, especially off streets and parking lots, washes them clean and carries pollutants with it.

Greenprint: A document that defines what must be protected and not compromised in the face of urban development. It identifies areas which have significant or important natural, landscape, ecological, cultural, spiritual or heritage value, and areas which are constrained due to natural value or hazard.

Green buffer: A planted strip of land created to separate and protect one type of land use from another, which is most useful for protecting important ecological or habitat areas.

Integrated Catchment Management Plan (ICMP): A document that states how the surface and groundwater catchments are to be managed, protected and, if possible, enhanced in response to past and anticipated adverse effects from future development and land use change.

Interpretation: Communication of information about, or the explanation of, the nature, importance, and purpose of historical, natural, or cultural resources, objects, sites and phenomena using personal or non-personal methods.

Iwi: The local tribe or people.

Mahinga kai: Food and other resources and the areas that they are sourced from.

Mauri: Life force or life-giving properties.

Reserve contribution: One activity within development contributions and are levied whenever an additional allotment or dwelling is created. Reserve contribution may be taken in land for reserves, or the cash equivalent.

Riparian margin: A strip of land directly adjacent to a river.

Runanga: The tribal council, board or assembly.

Tangata whenua: The people of the land.

Taonga: Treasured possessions, both tangible and intangible.

Treatment train: A series of interconnected stormwater management devices.

Wāhi tapu: A place that, according to custom, is sacred to Māori.

Zoning: In land use planning, the designation of specific sites for specific uses.

Appendix: Styx Vision maps, Overview, C, D, I, J & K

STYX VISION 2000 - 2040

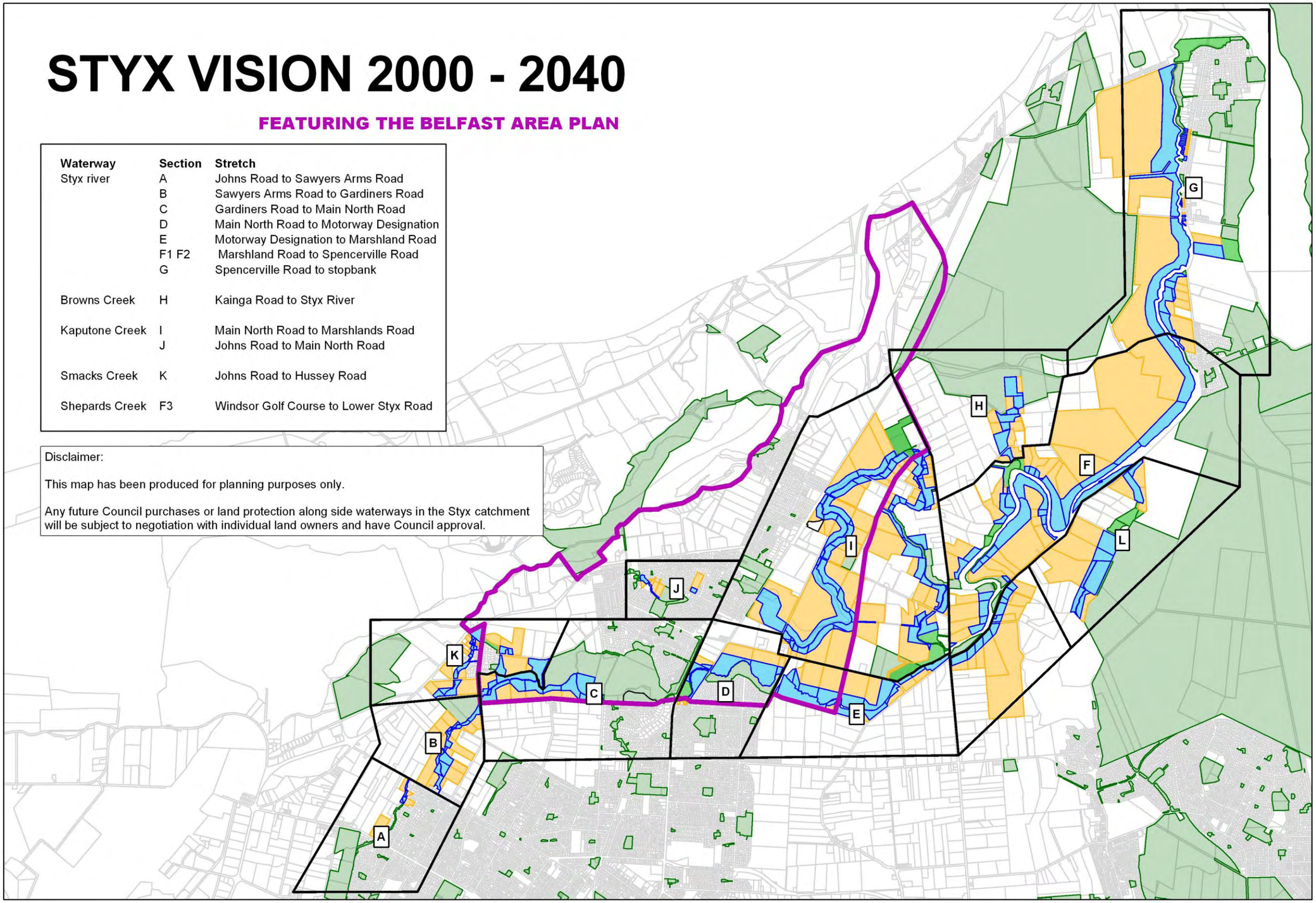
FEATURING THE BELFAST AREA PLAN

Waterway	Section	Stretch
Styx river	A	Johns Road to Sawyers Arms Road
	B	Sawyers Arms Road to Gardiners Road
	C	Gardiners Road to Main North Road
	D	Main North Road to Motorway Designation
	E	Motorway Designation to Marshland Road
	F1 F2	Marshland Road to Spencerville Road
	G	Spencerville Road to stopbank
Browns Creek	H	Kainga Road to Styx River
Kaputone Creek	I	Main North Road to Marshlands Road
	J	Johns Road to Main North Road
Smacks Creek	K	Johns Road to Hussey Road
Shepards Creek	F3	Windsor Golf Course to Lower Styx Road

Disclaimer:

This map has been produced for planning purposes only.

Any future Council purchases or land protection along side waterways in the Styx catchment will be subject to negotiation with individual land owners and have Council approval.



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STYX RIVER

Gardiners Rd to Main North Rd Section C

N
W E
S

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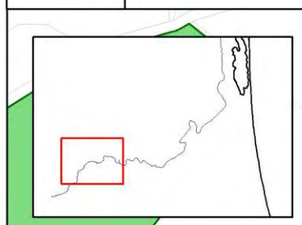
Date: 19/Nov/2008



Harewood Crematorium

Willowbank

Johns Road

Historic Building

Disclaimer:

This map has been produced for planning purposes only.

Any future Council purchases or land protection along side waterways in the Styx catchment will be subject to negotiation with individual land owners and have Council approval.

No.	Property		No.	Property	
1	330	STYX MILL ROAD	10	204	STYX MILL ROAD
2	282	GARDINERS ROAD	11	164	STYX MILL ROAD
3	282	GARDINERS ROAD	12	138	STYX MILL ROAD
4	290	GARDINERS ROAD	13	130	STYX MILL ROAD
5	60	HUSSEY ROAD	14	12	STYX MILL ROAD
6	9	SPRINGVALE GARDENS			
7	250	STYX MILL ROAD			
8	232	STYX MILL ROAD			
9	74	HUSSEY ROAD			

Proprosed Protection
Styx Catchment
Ponds
Pest Proof Fence
Land Parcels
Crown Land
Unformed Legal Road
Willowbank Reserve
Styx River Catchment
Flood Plain City Plan
Private Property
UniqueFeatures
Pedestrian River Crossing
Designation Northern Arterial
Underpass
Heritage Site
Styx River
Walking Path
Street Centerline
Road Side Parking
Spring CREAS
Spring ECAN
Proposed Parking
Property Affected
Road Names

0.00 0.15 0.30 0.45 0.60 0.75
Kilometers

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STYX RIVER

Main North Rd to Motorway Designation Section D

N
W E
S

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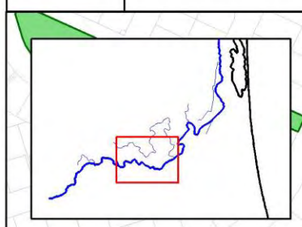

Legend

EsplanadeStrip	Heritage Site
Proposed Protection	Styx River
CCC Ownership	Walking Path
Ponds	Street Centerline
Land Parcels	Road Side Parking
Crown Land	Spring CREAS
Unformed Legal Road	Spring ECAN
Flood Plain City Plan	Proposed Parking
City Plan Variation 48	Property Affected
Private Property	Jetty
Pedestrian River Crossing	Road Names
Designation Northern Arterial	UniqueFeatures
Underpass	
Special Consideration	

0.00 0.06 0.12 0.18 0.24 0.30
Kilometers

Disclaimer:

This map has been produced for planning purposes only.

Any future Council purchases or land protection along side waterways in the Styx catchment will be subject to negotiation with individual land owners and have Council approval.

Number	Property	
1	3	CUNLIFFE ROAD
2	5	CUNLIFFE ROAD
3	7A	CUNLIFFE ROAD
4	9	CUNLIFFE ROAD
5	1-15	CUNLIFFE ROAD
5	2-15	CUNLIFFE ROAD
6	480F	MAIN NORTH ROAD
7	470	MAIN NORTH ROAD
8	480	MAIN NORTH ROAD
9	53	WILLOWVIEW ROAD
10	486	MAIN NORTH ROAD
11	120	RADCLIFFE ROAD
12	120	RADCLIFFE ROAD
13	132	RADCLIFFE ROAD

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KAPUTONE CREEK

Main North Rd to Marshland Rd Section I

N W E S

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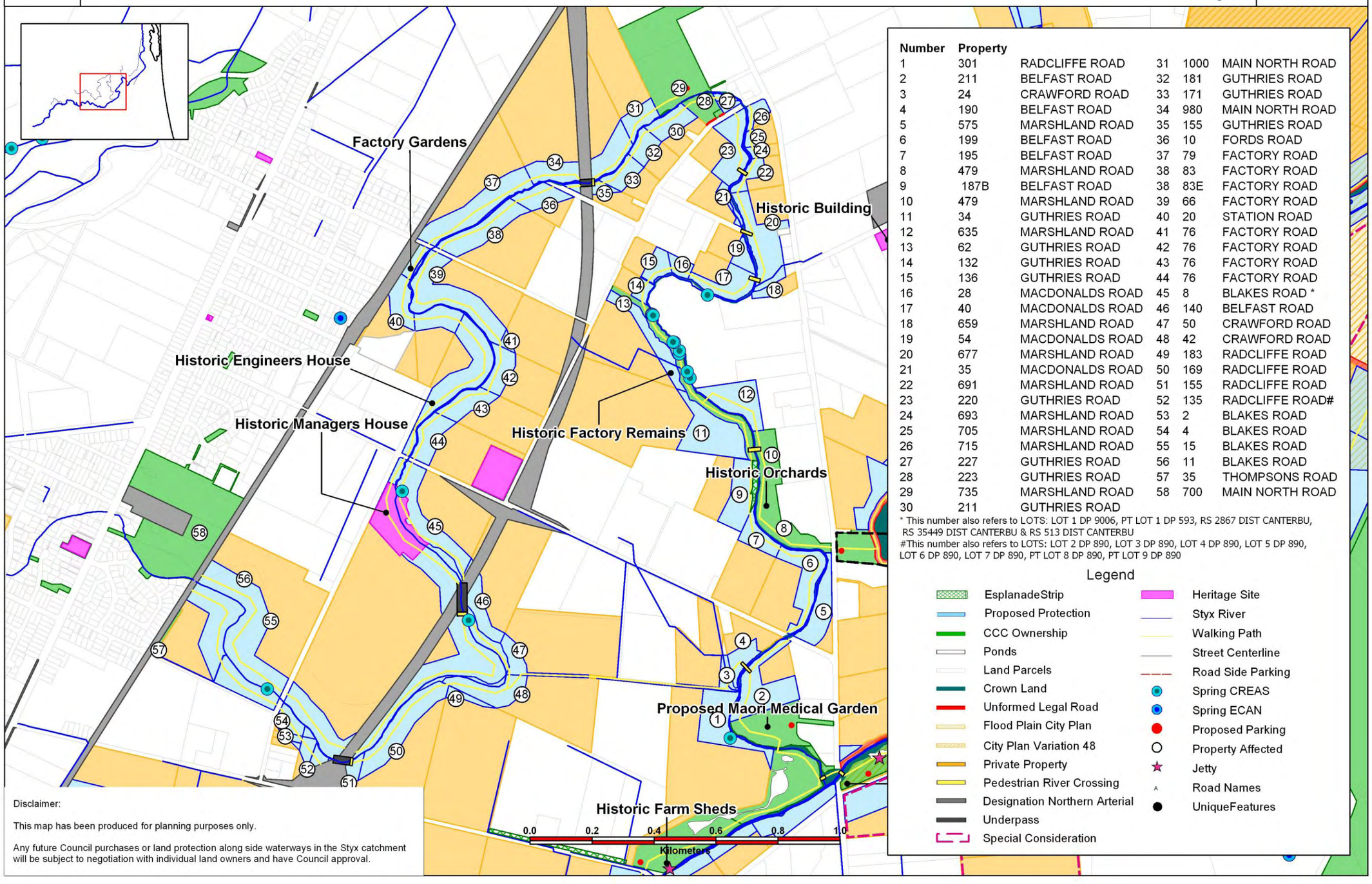

Number	Property				
1	301	RADCLIFFE ROAD	31	1000	MAIN NORTH ROAD
2	211	BELFAST ROAD	32	181	GUTHRIES ROAD
3	24	CRAWFORD ROAD	33	171	GUTHRIES ROAD
4	190	BELFAST ROAD	34	980	MAIN NORTH ROAD
5	575	MARSHLAND ROAD	35	155	GUTHRIES ROAD
6	199	BELFAST ROAD	36	10	FORDS ROAD
7	195	BELFAST ROAD	37	79	FACTORY ROAD
8	479	MARSHLAND ROAD	38	83	FACTORY ROAD
9	187B	BELFAST ROAD	38	83E	FACTORY ROAD
10	479	MARSHLAND ROAD	39	66	FACTORY ROAD
11	34	GUTHRIES ROAD	40	20	STATION ROAD
12	635	MARSHLAND ROAD	41	76	FACTORY ROAD
13	62	GUTHRIES ROAD	42	76	FACTORY ROAD
14	132	GUTHRIES ROAD	43	76	FACTORY ROAD
15	136	GUTHRIES ROAD	44	76	FACTORY ROAD
16	28	MACDONALDS ROAD	45	8	BLAKES ROAD *
17	40	MACDONALDS ROAD	46	140	BELFAST ROAD
18	659	MARSHLAND ROAD	47	50	CRAWFORD ROAD
19	54	MACDONALDS ROAD	48	42	CRAWFORD ROAD
20	677	MARSHLAND ROAD	49	183	RADCLIFFE ROAD
21	35	MACDONALDS ROAD	50	169	RADCLIFFE ROAD
22	691	MARSHLAND ROAD	51	155	RADCLIFFE ROAD
23	220	GUTHRIES ROAD	52	135	RADCLIFFE ROAD#
24	693	MARSHLAND ROAD	53	2	BLAKES ROAD
25	705	MARSHLAND ROAD	54	4	BLAKES ROAD
26	715	MARSHLAND ROAD	55	15	BLAKES ROAD
27	227	GUTHRIES ROAD	56	11	BLAKES ROAD
28	223	GUTHRIES ROAD	57	35	THOMPSONS ROAD
29	735	MARSHLAND ROAD	58	700	MAIN NORTH ROAD
30	211	GUTHRIES ROAD			

* This number also refers to LOTS: LOT 1 DP 9006, PT LOT 1 DP 593, RS 2867 DIST CANTERBU, RS 35449 DIST CANTERBU & RS 513 DIST CANTERBU
#This number also refers to LOTS: LOT 2 DP 890, LOT 3 DP 890, LOT 4 DP 890, LOT 5 DP 890, LOT 6 DP 890, LOT 7 DP 890, PT LOT 8 DP 890, PT LOT 9 DP 890

Legend

- EsplanadeStrip
- Proposed Protection
- CCC Ownership
- Ponds
- Land Parcels
- Crown Land
- Unformed Legal Road
- Flood Plain City Plan
- City Plan Variation 48
- Private Property
- Pedestrian River Crossing
- Designation Northern Arterial
- Underpass
- Special Consideration
- Heritage Site
- Styx River
- Walking Path
- Street Centerline
- Road Side Parking
- Spring CREAS
- Spring ECAN
- Proposed Parking
- Property Affected
- Jetty
- Road Names
- UniqueFeatures

Disclaimer:

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CHRISTCHURCH
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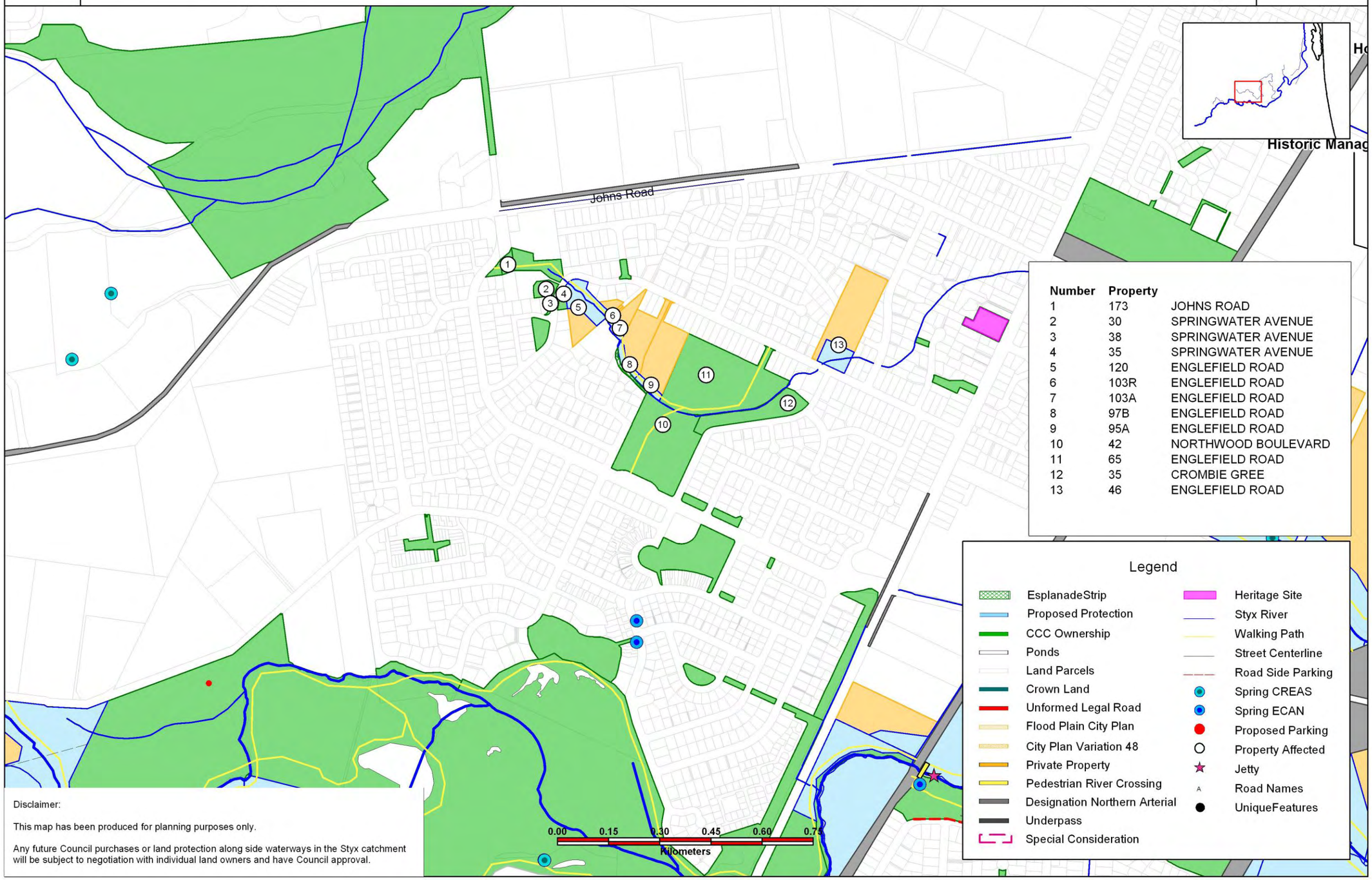
KAPUTONE CREEK

Johns Rd to Main North Rd Section J

N
W E
S

WorkSpace: 100091H.gws
Layout: SecJ
Scale: 1:8000
Date: 18/AUG/2008



Number	Property	
1	173	JOHNS ROAD
2	30	SPRINGWATER AVENUE
3	38	SPRINGWATER AVENUE
4	35	SPRINGWATER AVENUE
5	120	ENGLEFIELD ROAD
6	103R	ENGLEFIELD ROAD
7	103A	ENGLEFIELD ROAD
8	97B	ENGLEFIELD ROAD
9	95A	ENGLEFIELD ROAD
10	42	NORTHWOOD BOULEVARD
11	65	ENGLEFIELD ROAD
12	35	CROMBIE GREE
13	46	ENGLEFIELD ROAD

Legend

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SMACKS CREEK

Johns Rd to Hussey Rd Section K

N W E S

WorkSpace: 100091H.gws
Layout: SecK
Scale: 1:4000
Date: 03/Sep/2008

NO.	Property Affected
1	515 JOHNS ROAD
2	15 WILKINSONS ROAD
3	243 GARDINERS ROAD
4	509 JOHNS ROAD
5	12 WILKINSONS ROAD
6	5R STELLA PLACE
7	461 JOHNS ROAD
8	455A JOHNS ROAD
9	367 GARDINERS ROAD
10	367A GARDINERS ROAD
11	373 GARDINERS ROAD
12	375 GARDINERS ROAD
13	377 GARDINERS ROAD
14	445 JOHNS ROAD
15	443JOHNS ROAD
16	379 GARDINERS ROAD
17	336 GARDINERS ROAD
18	51 HUSSEY ROAD
19	60 HUSSEY ROAD
20	74 HUSSEY ROAD

Harewood Crematorium

Willowbank

Legend

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0.00 0.06 0.12 0.18 0.24 0.30
Kilometers

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