



CHRISTCHURCH BOTANIC GARDENS MANAGEMENT PLAN

2007



CHRISTCHURCH
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Foreword

The Christchurch Botanic Gardens¹ has had a long history of amenity and horticultural development and change, reflecting the interests and values of the various curators and the Christchurch gardening public. This updated plan reinforces these values in a comprehensive and organised way, in addition to promoting the strengthening of the scientific functions of the Gardens and reflecting modern botanic garden plant collection and display trends.

Within this plan, the Gardens has been organised according to a proposed circulation network and open space system. A notable feature of the circulation system will be the formation of five special purpose walkways emphasising different aspects of the Gardens' cultural and botanical features. The collections identified in the plan have been amended and reorganised to reflect the above proposed patterns. In addition, the more 'informal' plant groupings have mostly been situated on the peripheries of the Gardens and along the Avon River corridor, with the more formal collections situated in the inner core. Especially attractive displays are situated at the main entrances and along the proposed Victoria Walk.

Overall, this plan aims to not only build on existing values but also to bring the Gardens into the 21st century by reflecting the wider significance of the plant world in an era of rapid environmental change, as well as by acknowledging Southern Hemisphere values.

Introduction

The Gardens is Christchurch's single most popular visitor destination according to the Canterbury Tourism Council. Its popularity is illustrated by the estimated 1.2 million visits made by local and other visitors every year.

The existing strength of the Gardens lies in its scenic and horticultural qualities. This plan aims to strengthen these values, in addition to improving its botanical aspects, especially those with garden associations. Improvement of the Gardens scenic and botanical qualities and upgrading the circulation system in keeping with the Gardens civic importance will also ensure that the Gardens continues to function as one of Christchurch's most important visitor attractions and also be a feature of major economic importance to the City.

This updated plan has been developed from the 1995 edition with considerable new content (see Parts I and IV below).

The Plan is divided into four parts:

Part I – Provides the rationale for a botanic gardens in Christchurch and assesses the expected form of the Gardens against the history, development and nature of botanic gardens worldwide and their relevance in the modern world (prepared by the former curator of the Gardens, the late Dr David Given²).

Part II – Describes the Gardens resources and comments on issues and opportunities affecting the Gardens.

¹ From this point forward in this plan the Christchurch Botanic Gardens will be referred to as the 'Gardens'.

² Dr Given was curator from October 2003 to November 2005.

Part III – Management goals, objectives and policies.

Part IV – An **Issues and Actions Plan**, which recommends the future direction and development of the Gardens. It is the result of a major strategic review undertaken by the late Dr David Given over the two years leading up to the publication of the draft management plan in 2006. Under specific categories of activity, it presents a discussion of issues and needs, proposes goals to be achieved and recommends relevant actions to be taken.

This management plan is linked to a number of other plans and documents - in particular, to the Hagley Park Management Plan 2007 and the Hagley Park/Botanic Gardens Master Plan 2007. Both these plans were advertised for public comment in 2006 simultaneously with this one. The Hagley Park Management Plan covers the management of Hagley Park, which surrounds and is closely linked with the Gardens. The master plan is a long term strategic plan for both Hagley Park and the Gardens, and includes reference to proposed actions, projects and concepts detailed in the management plans.

The objectives and policies, and proposed goals and actions, of this management plan provide an updated management direction for the Gardens. Through public involvement, it is anticipated this reflects a consensus of opinion on the future of the Gardens.

Acknowledgements

The following Christchurch City Council staff contributed in a significant and specific way to the development of this updated plan:

Derek Roozen – Parks and Waterways Planner (overall plan co-ordination and preparation);

Dr David Given – Curator (strategic review);

Jeremy Hawker – Botanical Services Operations Team Manager (plan overview and co-ordination of Botanical Services Operations Team input);

Jenny Moore – Landscape Architect (landscape layout/circulation concepts);

Crispin Schurr – Architect (facilities (building) concepts);

The development of this plan was also only possible with the valued input of many other Council staff, including, in particular, staff of the Botanical Services Operations Team.

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Plan Status

Adopted by the Christchurch City Council on 16 August 2007 as the operative plan.



Albert Edward Oak (planted 1863)

PART I

RATIONALE FOR A BOTANIC GARDENS FOR CHRISTCHURCH

Explanation:

Putting the Gardens in context! This Part was prepared by Dr David Given.



1. What is a botanic garden and its purpose?

Although the boundaries between public parks, private plant collections, scientific collections and scientifically based and landscaped public gardens are blurred, a widely accepted definition for a botanic garden is that:

Botanic gardens are institutions holding documented collections of living plants for the purposes of scientific research, conservation, display and education.

Using a functional approach, the International Botanic Gardens Conservation Strategy includes a comprehensive list of characteristics that both generally define the key characteristics of botanic gardens and the diversity of roles that they can assume:

- Adequate labelling of plants.
- An underlying scientific basis for the collections.
- Communication with other like-minded institutions, including information transfer.
- Exchange of seeds and other propagating material within the limits of national and global legislative constraints.
- A long term commitment to, and responsibility for, maintenance of plant collections.
- Maintenance of a research programme and associated facilities, such as a herbarium and laboratory.
- Monitoring of plants in collections.
- Being open to the public.
- Promoting conservation through extension and environmental education activities.
- Proper documentation of the collections.
- Undertaking scientific or technical research on plants in the collection.

2. What does the Gardens provide?

Some of the features of the Gardens that are important for Christchurch are:

- Three quarters of Christchurch's residents visit the Gardens each year. Two thirds of international visitors to the city visit the Gardens. Overall satisfaction rates have been surveyed at over 95%.
- Most local people come to the Gardens to appreciate the tree, lawn and garden atmosphere, where they can relax in a setting dominated by greenness and plants, enhanced with the serenity of the Avon River / Ōtakaro.
- The extensive collections provide a horticultural experience of high quality and variety. This includes New Zealand native species/woodland areas, exotic trees and shrubs, alpine plants and bulbs, orchids, cacti and succulents, water plants and exotic woodlands that are a blaze of colour during the spring when daffodils and bluebells are in flower.
- The Gardens form part of the Christchurch Cultural Precinct, which is an assemblage of historic and cultural institutions in the central city and makes a significant contribution to the cultural and historic fabric of the city.
- The Gardens has considerable historic and heritage value, being associated with many key events in the development of Christchurch. The Gardens and Hagley Park have seen historic events of importance, such as John Robert Godley's farewell speech to the Canterbury colonists, instrument calibration by Robert Falcon Scott and Ernest Shackleton en route to Antarctica, the 1906 Christchurch Exhibition and the early acclimatisation of exotic animals in the late nineteenth century. Three of the Gardens' buildings have heritage listings: the Curators House, the Bandsmen's Memorial Rotunda and the Cuninghame House (New Zealand's largest heated conservatory).
- From time to time the Gardens is the venue for concerts and art exhibitions.

- The Gardens are a significant and important area for the support of native New Zealand wildlife. This includes resident kereru (woodpigeon), New Zealand scaup, paradise duck, native freshwater crayfish and a large array of native and introduced fungi. The recent BioBlitz³ identified over 800 animals, plants, fungi and single celled species, in addition to those that have been deliberately planted in the Gardens.
- The Gardens, along with Hagley Park, provides experimental sites and trial areas for local researchers, including students, and for the horticultural industry.
- Overall, the Gardens provides a peaceful green environment that belongs to every person living in the city, as well as benefits every visitor. It is a place very close to the city centre that is accessible every day of the year.

3. What is the Gardens national and international standing?

The Gardens are frequently referred to in terms of international significance and sometimes as being a 'top' botanic garden. How justified are such expressions of support?

- The area of the Gardens is similar to that of many major botanic gardens such as the Royal Botanic Gardens (RBG) Sydney, Montreal and the RBG Melbourne, although it is well below the size of the Missouri Botanic Gardens in the USA and RBG Kew in London, United Kingdom.
- The size and variety of the Gardens collections is impressive and probably, in combination, the largest in New Zealand, with about 6,500 catalogued species and cultivars and a further estimated 1,500 to 2500 uncatalogued conservatory specimens. The total number of specimens (accessions⁴) is believed to be about 35,000. As a comparison, the RBG Edinburgh in Scotland has one of the

world's largest collections (16,000 taxa and about 40,000 accessions), second only to the RBG Kew.

- The Gardens is reasonably old by world standards, being one of the two oldest in New Zealand and one of the earlier gardens established in the Southern Hemisphere.
- Visitor numbers, on an annual basis, are high when compared with those for overseas botanic gardens. Including repeats, Christchurch has about 1.2 million people through the gates each year, including three quarters of Christchurch residents and about 250,000 international tourists – probably about 550,000 visitors in total annually. These figures are high by world standards.
- It is in the very limited range of functions based round the collections and including conservation, education and research, that the Gardens does not compare so favourably with many other well known botanic gardens. The Gardens has a small herbarium (although this is valuable for its size, in that it includes the Armstrong Herbarium). The Gardens has a valuable, but under-resourced, library. There is little active support of conservation programmes, such as recovery of threatened plant species. No seed bank or germplasm bank facilities for preservation of rare species, unusual cultivars or plants used in recovery programmes have been developed.

In Australasia, at the present time, there is little doubt that the RBG Sydney and Melbourne, the Adelaide Botanic Gardens and Kings Park Botanic Garden in Perth have significantly greater overall status than Christchurch, which probably lies within a second tier of gardens that include Dunedin, RBG Tasmania, and Wellington.

Globally, a cluster of top level botanic gardens includes the RBG Kew and Edinburgh, Kirstenbosch in South Africa, Berlin, Singapore, Missouri and New York/Brooklyn, play a lead role. Some tens of gardens make up the next level. These include Frankfurt, Munich, Dublin, New York/Bronx, Berry (USA), Chicago, Fairchild Tropical (USA), Royal Botanic Garden Hamilton (Canada), Strybing Arboretum (USA), Morton Arboretum (USA), Montreal, Leningrad, Bogor

³ An event where Council staff, scientists, students and the public gathered in Hagley Park and the Gardens to count as many species as possible in a 24 hour survey.

⁴ Distinct varieties of plants.

(Indonesia), Las Palmas (Canary Islands, Spain) and the National Tropical Garden (Hawaii, USA).

Christchurch has yet to reach this level of significance with its Gardens. Nevertheless, it should strive towards this level of recognition, but to do so it will have to assume a greater range of functions than achieved so far.

Of special significance is that that the Gardens is in the setting of Hagley Park. Hagley Park, as a large inner city green space, is dedicated to recreation and public use, as set down in the original 1855 ordinance formalising this area. The iconic nature of the Gardens is reinforced when the overall green space size of the Gardens and Hagley Park is compared with other urban green space areas as the following table shows:

Table 3.1: Comparison of Key Urban Open Space Areas

Name	City	Hectares
The Mall	Washington, DC	2670
Fairmont Park	Philadelphia	1692
Chapultepac Park	Mexico City	850
Phoenix Park	Dublin	712
City Park	New Orleans	610
Golden Gate Park	San Francisco	406
Stanley Park	Vancouver	400
Kings Park and Botanic Gardens	Perth	400
Englischer Garten	Munich	400
Central Park	New York	341
Hyde Park	London, UK	255
Royal Park and Princes Park	Melbourne	227
Centennial Park	Sydney	222
Town Belt	Dunedin	205
Hagley Park and Botanic Gardens	Christchurch	192
Royal Park (only)	Melbourne	188
Royal Botanic Gardens	London	121
Piedmont Park and Botanic Garden	Atlanta	109
Bogor Botanic Garden	Bogor	87
The Domain	Auckland	81
Matheson Hammock and Botanic Garden	Miami	74

4. Who uses the Gardens?

Recent surveys⁵ provide an accurate profile of the visitors to the Gardens:

- 65% of visitors are repeat visitors (have been to the Gardens before).
- 50% of visitors are from Christchurch and, of the remainder, about 20% are equally from the United Kingdom and Australia.
- Most visitors from outside Christchurch are on vacation.
- Female visitors outnumber males by over 10%.
- 22% of visitors are aged 20 to 29, 60% are aged 20 to 49; and the 60 years, and older, age group accounts for 20% of visitors.
- There is a significant number of retired visitors from Christchurch.
- Nearly 75% of visitors come with family and friends, and only 2% with a tour or tour group.
- Between 13 and 20% visit with children (differing seasonally).
- The main reasons to visit are to walk (88%), relax (52%), to look at trees and plants (43%) or to pass through (37%).
- Most spend up to two hours in the gardens, few more than three hours.

What is people's source of information about the Gardens? Almost 90% of Christchurch based visitors say that they have "always known about it". Of visitors from outside Christchurch, 36% got information from a guide book. Most visitors have some awareness of attractions within the gardens (96% of Christchurch visitors and 43% of those from outside Christchurch).

⁵ Opinions Market Research Ltd Visitor Audit and Profile Exercise Botanic Gardens 2004. See Section 15 (Page 46), which sources information from a 1985 survey of Gardens visitors.

Most enjoy their visits, but some experiences fall short of expectations. This includes not gaining more knowledge of plants, not seeing enough native New Zealand plants, not having as good a horticultural experience as anticipated and that there is a lack of scientific activity. Despite this, most aspects of the Gardens are rated highly, the lowest rating being for the information centre, parking, botanical information for guided staff, information signs on plant displays, guided tours, the café, gifts and souvenirs and the toilets. Almost all visitors value the Gardens in a general sense and most (88%) agree that it is the most important visitor attraction in Christchurch.

Public consultation in late 2004 has been very important. The general comments on the Gardens were overwhelmingly positive, including that the Gardens are “better than any others seen in New Zealand”, “one of the best in the world” and “the jewel in the Central City area”. Others included “cannot imagine any visitor being disappointed” and “I just love the Gardens”. Specific positives noted in the submissions are enjoyment of walking round the Gardens and of good landscape and views, appreciation of the ‘rooms/special places’, enjoyment of flowers, appreciation of both native and exotic elements, and keeping the gardens much as they are now.

Issues raised include:

- It is time for a new management plan.
- There is a need for a clearer vision and objective statement.
- There is need for reflection of cultural diversity.
- A balance is needed between botanical and tourism needs.
- Development needs to build on both the current management plan and the original ideals of the Gardens.
- A lack of overall integration is evident.
- There is continued need for consultation.

The obvious ‘public’ are not the only users of the Gardens. There is also a significant number of

‘behind the scenes’ users. This includes individuals and groups that use the library, with its particular strengths in botany and horticulture, the herbarium, the grounds and collections for experimental science and education, and those who are interested in heritage aspects of the Gardens. The users include academic, research and educational institutions. They include other botanic gardens – the global botanic garden community.

Users, whoever they may be, expect high quality and excellence in practice and presentation. The very appellation ‘botanic garden’ implies standards and expectations, as do such descriptors as ‘public museum’, ‘art gallery’ and ‘national park’. The title ‘botanic garden’ must not be accepted or worn lightly. Expectations are exceeded in some areas; two examples being the opportunities to take spectacular photographs and to see wildlife. Such aspects of the Gardens should never be regarded just as a means to ‘neutralise’ the deficiencies, but rather as strengths that need to be built on and marketed.

5. General issues for the Gardens

The Greater Christchurch Urban Development Strategy (UDS) points to important issues for the Gardens. These include that there will be growth in the number of people in ‘greater Christchurch’ from the present 380,000 to 430,000 by 2021. There will be an aging population, greater reliance on private transportation and greater environmental awareness.

Tourism projections suggest doubling of tourist visits over an eight year period. Development of the Cultural Precinct concept and inner city revival is likely to result in visitors to the region staying longer in Christchurch and significantly longer or more visits by people to the Gardens. It is reasonable to assume that by 2013 the present 1.2 million visits to the Gardens will increase to at least 2 million per annum.



The review of and planning for the Gardens aims to ensure that all people in the region feel a sense of ownership of and pride in the Gardens. Improvement of the Gardens scenic and botanical qualities and its collections, along with the upgrading of its layout and circulation, will ensure that it continues to function as one of Christchurch's most important visitor attractions and as a significant economic and social contributor to the city.

6. Is there a need for change and development?

If the Gardens is to achieve the local, national and international status that many believe is appropriate, then it needs to be transformed from the existing civic and colonial model to being a more comprehensive and wider based multi-functional botanical garden. In the process of doing so, it will be important not to lose those distinctive features that make the Gardens uniquely 'Christchurch'. To achieve this new level of operation and retain a good balance is a major challenge.

Places such as botanic gardens survive as effective contributors to society only if they undergo periodic assessment of present practice, their managers are prepared to change where it is necessary and even for rejuvenation and re-orientation to occur. To avoid this process is for the botanic garden to decline through benign neglect. These considerations are the basis for the present period of activity and consultation for the Gardens, a renewed vision and goals, a firmer operational base and proposals for improved facilities.

The 1860s, when the Gardens were initially developed, were an exciting and innovative period for the study and growing of plants. John Armstrong, to whom much is owed for the initial development of the Gardens, was clearly familiar with the radical views of the world of nature promulgated by Darwin, Mendel, Wallace and others at that time. Legal changes and new construction technologies had led to a frenzy of activity, creating glass dominated conservatories. People were becoming aware of the botanical treasures in hitherto unknown lands and the

invention of the Wardian case⁶ ushered in a new era of transportation of plants across the seas. Scientific and horticultural societies were being set up and growing plants was no longer the domain of the rich and privileged.

Today, we are in an equally exiting and challenging period of development for botanic gardens. The last twenty years have seen the rapid rise of conservation as both a science and a social concern. We are seeing rapidly changing technologies for growing, displaying and propagating plants. Techniques for preserving reproductive material, such as cryo-preservation and novel genetic techniques, are giving ex-situ⁷ conservation and horticulture new importance. There are outstanding safety and biosecurity issues. The computer age is revolutionising education, science and interpretation. Environmental education has come of age. Large scale tourism is a recent phenomenon, with botanic gardens, museums and parks now having truly global profiles. Lifestyle changes, especially in cities, are dramatic. The planners and managers of the Gardens need to reflect and positively respond to this wide array of changes.

Basic botanic garden activities, such as education, conservation and research, are not yet well catered for in Christchurch. But they are becoming recognised by the city as significant botanic garden functions that need to be considered in redevelopment. There are a range of associated issues for the Gardens. There needs to be the development of better energy, water and waste efficiencies; the circulation and pathway system is often confusing and does not always show plants off to the best advantage; some key collections cannot be adequately displayed because of lack of space; there is need for renewal of interpretation and signage; and the Gardens lacks risk aversion and monitoring policies, along with performance indicators, to ensure that it continues to meet City Council planning, community support and botanic garden community expectations.

⁶ The direct forerunner of the modern terrarium (and the inspiration for the glass aquarium), invented by Dr. Nathaniel Bagshaw Ward (1791-1868) of London about 1829.

⁷ Off-site. Ex-situ conservation is the process of protecting an endangered species of plant or animal by removing it from an unsafe or threatened habitat and placing it or part of it under the care of humans.

Examples of specific areas of need and change include:

- Improved facilities for staff to carry out their duties.
- Modernised and more reliable propagating and holding facilities.
- A relational database to allow efficient cataloguing and retrieval of a wide range of plant related information.
- Dedicated education and improved display facilities.
- A science suite to include an enlarged herbarium, records archiving, library and a seed bank.
- Desk space for visiting professional staff and students, and meeting space.
- Probably new and enlarged retailing and food supply facilities.
- Improved circulation system (paths and driveways), including good pedestrian/vehicle separation.
- Irrigation reticulation.
- Greatly improved, and more extensive, signage and interpretation.

A special year for the Gardens will be 2013, when it celebrates its 150th anniversary. Its establishment year of 1863 is shared with the Dunedin Botanic Garden, making these two the oldest botanic gardens in New Zealand. Within the Australasian Region, the oldest botanic garden is the RBG Sydney (1816), followed by the RBG Tasmania in Hobart (1818), RBG Melbourne (1846) and the Adelaide Botanic Gardens (1855). The Gardens, while not being the oldest, is a relatively long established and, thus historic, botanic gardens. Major development of the Gardens is being targeted early enough so that by 2013 the city will have a proven world class facility that is fully 'botanic', while being an outstanding 'garden'.



CHRISTCHURCH
BOTANIC
GARDENS
EST 1863



PART II: RESOURCE INFORMATION

Explanation:

This Part describes the current status and structure of the Gardens. It includes some discussion of issues affecting the Gardens (see Part IV for a more detailed assessment of issues).



7. Location and regional context

The Gardens is located in an ‘enclave’ defined by the Avon River within Hagley Park, less than one kilometre west of Cathedral Square in the city of Christchurch on the east coast of the South Island of New Zealand, latitude 43° 31’ 48” S, longitude 170° 37’ 13” E.

The Gardens significance to Canterbury is seen in visitor statistics (see Sections 4 and 15). The Gardens’ strategic location at the end of the Worcester Boulevard ‘amenity linkage’, recognised in the City Plan as a link between important public places in the city centre, contributes to its popularity.

The Gardens is one of the three main attractions in the City that overseas visitors specifically ask about and is a major recreational facility for the people of the Canterbury region. It is the City’s most important open space for passive recreation.

Hagley Park provides an important setting and ‘green’ buffer between the city and the Gardens on its northern, western and southern sides. The approach to the Gardens from the Riccarton Road roundabout is especially enhanced with views of the Gardens through Hagley Park. Riccarton Avenue and Rolleston Avenue are the only two roads from which there are outside views of the Gardens.

Access to the Gardens can be obtained from three entrances on Rolleston Avenue and three bridges over the Avon River at the Botanic Gardens Car Park off Armagh Street, the United Car Park off Riccarton Avenue, and opposite the band rotunda near Riccarton Avenue.

8. Legal and planning

Gardens management area

The areas addressed by this management plan (see Figure 8.1 on Page 10) include:

- Area 1** Inside the loop of the Avon River.
- Area 2** The Daffodil Woodland area, Pinetum and the United Car Park between the Avon River, hospital grounds and the United sports club area.
- Area 3** The Avon River corridor, including the northern bank from the United Car Park to the Botanic Gardens Car Park.

Areas 2 and 3, which are legally part of Hagley Park, are included in this plan as they have been managed as part of the Gardens for over forty years and are adjacent to the legal Gardens area. This total area is approximately thirty one hectares.

Legal description of the management area

Legal Botanic Gardens area (Area 1):

Part Reserve 25 SO 11870 (21.1374 hectares).

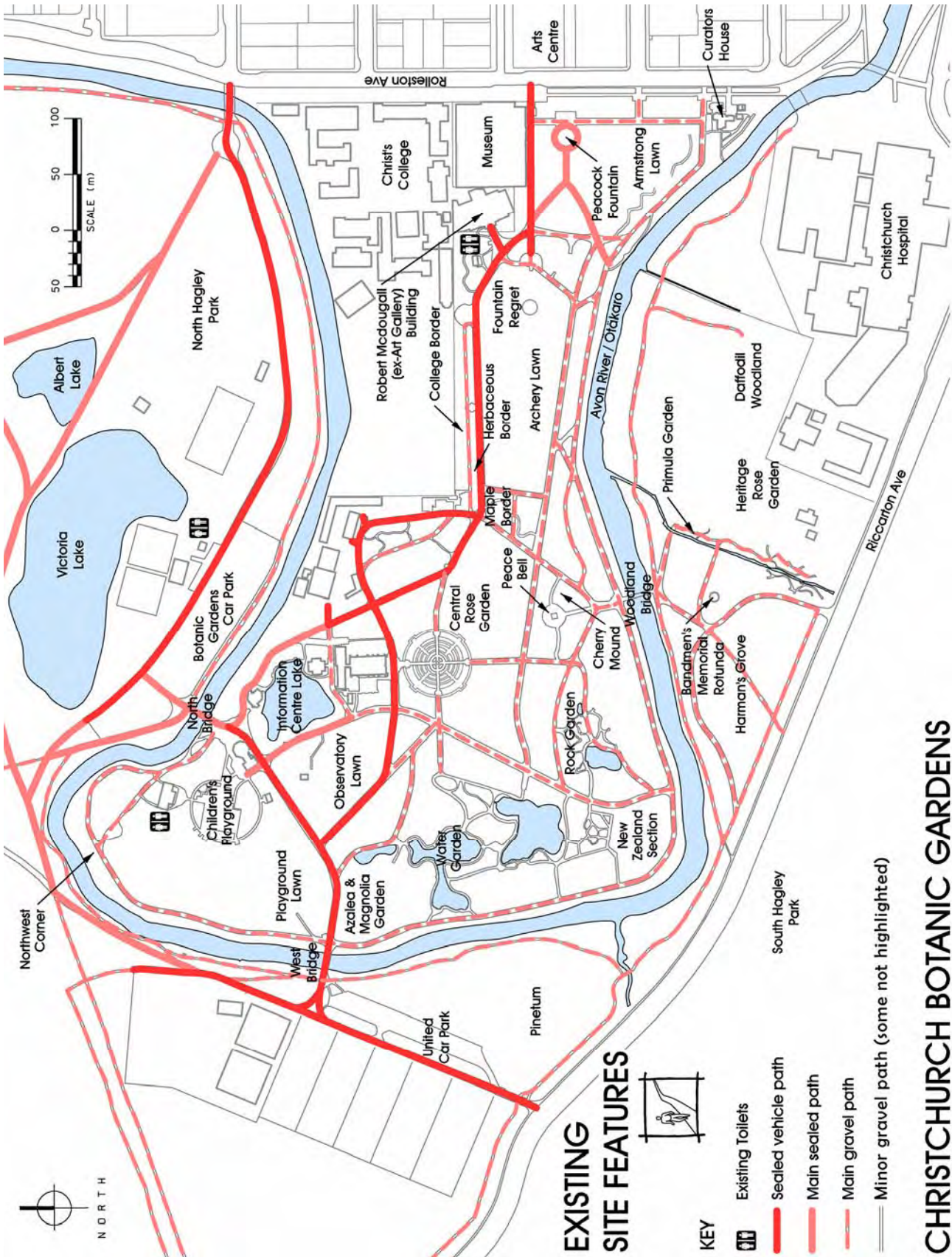
Hagley Park area managed as part of the Botanic Gardens (Areas 2 and 3):

Part Rural Section 41181 SO 15235, Part Reserve 24 (Hagley Park) (approximately 12 hectares).

All of the above area is held subject to the Christchurch City (Reserves) Empowering Act 1971. Area 1 is specifically singled out in the Act as being “*vested in the Corporation for an estate in fee simple as a reserve for a botanic garden*”.



Figure 8.1: Existing site features



Classification

Under the Reserves Act 1977, Area 1 is classified as Local Purpose (Botanic Garden) Reserve (Section 23 of the Act) (New Zealand Gazette 5 March 1990 p38). Areas 2 and 3 are part Recreation Reserve under the Reserves Act, and are also covered by the Hagley Park Management Plan.

Planning Status

The Gardens is zoned in the City of Christchurch City Plan as Conservation 2⁸.

9. Administration

Management

The Gardens is managed by the Botanical Services Operations Team of the Christchurch City Council's Transport and Greenspace Unit, City Environment Group. This team is also responsible for the day to day management of Hagley Park and Mona Vale.

Organisation and staff

See Figure 9.1 on Page 12 for a staff position diagram.

Financial

The cost of services for the Christchurch City Council in 2007/2008 to provide and manage the Christchurch Botanic Gardens so that residents and visitors to Christchurch can enjoy the Gardens' environments and plant collections is given in Table 9.1⁹.

Table 9.1: Gardens' Cost of Services 2007/2008

Operating	\$4,821,000
Revenue	\$169,000

⁸ This zone covers a small group of public parks of city-wide significance that help provide the city with its unique scenery and character. Parks with colonial heritage, such as the Botanic Gardens, Mona Vale, and Risingholme Park, historic cemeteries, and other 'garden city' parks are included in the zone.

⁹ From: Long-Term Council Community Plan 2006-16, Vol 1, p129.

Friends of the Christchurch Botanic Gardens

On 18 October 1988 a meeting was held for the purposes of exploring the feasibility of establishing a 'Friends of the Gardens Society. Organisations represented included the Canterbury Horticultural Society, Christchurch Beautifying Association, Botany Division of the Department of Scientific and Industrial Research, Department of Horticulture, Lincoln University, New Zealand Nurserymen's Association, Royal New Zealand Institute of Horticulture, New Zealand Institute of Park and Recreation Administration and the Canterbury Botanical Society.

In 1989 the Society was officially registered as an incorporated society and became the Friends of the Gardens Incorporated (from this point on in this plan, the Society will be referred to as the 'Friends').

The inaugural Annual General Meeting was held on 6 November 1989.

The purpose for the Gardens, as stated in the Council's Annual Plan, has been taken as the Friends' aim:

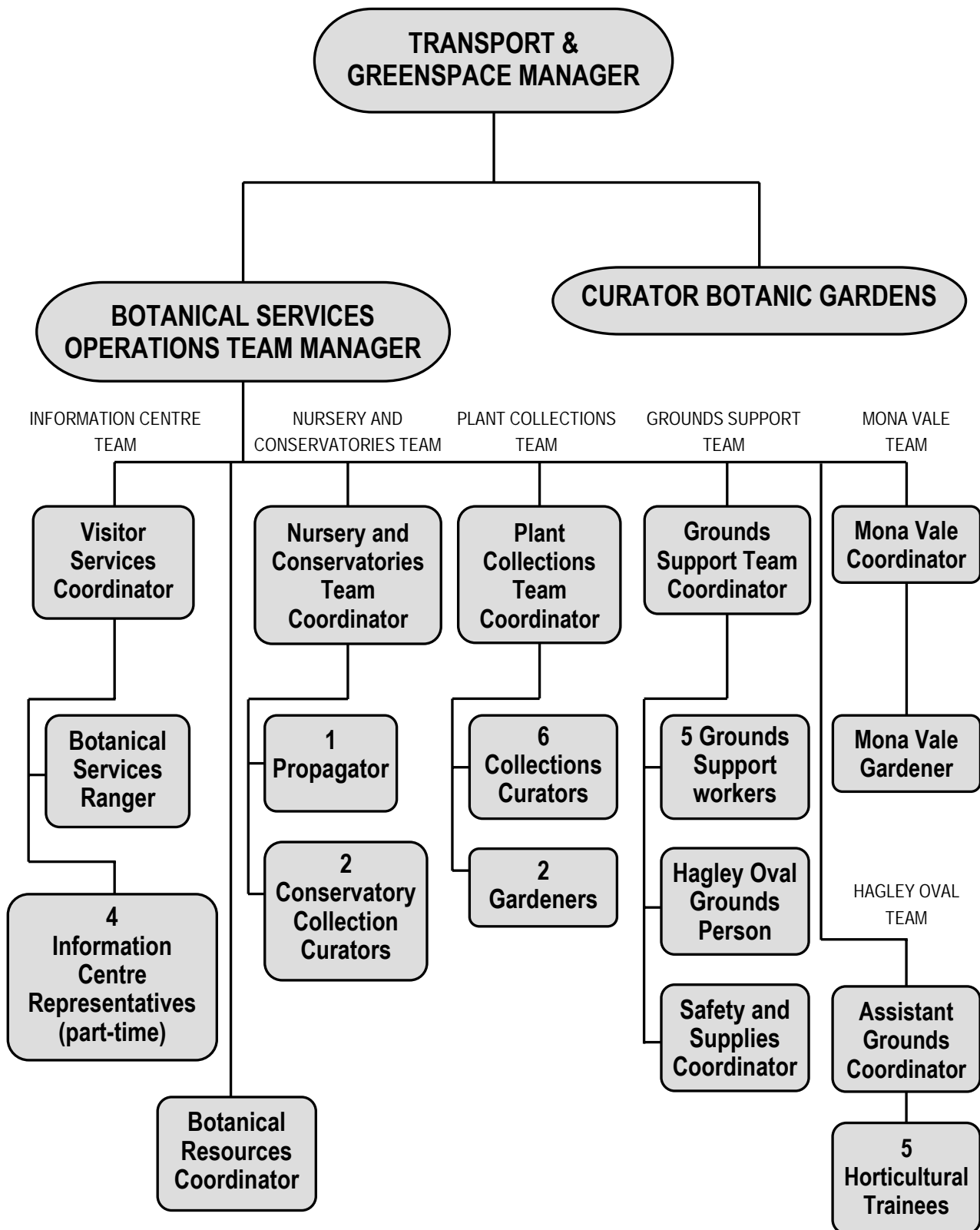
"To provide and display representative plant collections from temperate to sub-tropical world regions for public enjoyment, education, research and scientific advancement.

To disseminate information to botanical institutions world-wide through exchange of plants and other material and promote international co-operation in the conservation of rare and endangered species".

The objectives of the Friends are:

- a) To promote, support and protect the Gardens for the purpose for which they are established.
- b) To promote and support activities consistent with the purpose of the Gardens.

Figure 9.1: Staff positions



- c) To encourage public interest in, and appreciation of, plants, including a knowledge of their culture and use.
- d) To assist with the Gardens' activities such as lectures, demonstrations and distribution of plants.
- e) To assist with the guiding of visitors in the Gardens.
- f) To assist with the acquisition of plants, including new introductions and additions to existing collections.
- g) To assist in the acquisition of funds and/or assets for special purposes associated with the Gardens.
- h) To promote membership of the Friends and support its objectives.

10. Functions and operations

Plant acquisition and propagation

Plant exchange

Plant exchange through a seed catalogue known as the Index Seminum is a very important part of the Gardens' botanical programme. The Gardens currently exchanges seed lists with 200 different institutions from around the world.

The seed exchange is the primary means by which the Gardens can obtain new, unusual or rare plants. Generally, the nursery trade is not a good source of plant material for the Gardens because:

- The range of plants grown is very limited.
- The naming of plants is sometimes suspect.
- Origin of propagation material is often unknown.

However, there are still some specialist nurseries who offer a wide variety of plants of interest to the Gardens.

Nursery

The nursery is an important component for the successful running of the Gardens. Currently, the nursery operates eight glasshouses, a potting shed, cold frames and outdoor beds for growing on of propagated material. Of the glasshouses, four are used for growing on tropical plants and are heated to 18-20°C. The cooler houses are heated to 13-15°C in winter.

Potting shed

The potting shed is a vital part of the nursery operation for the carrying out of specialist propagation work.

Boiler house

Contained below floor level in the potting shed are the boilers that heat the nursery glasshouses.

Plant records and identification

Plant records

Plant record keeping is an important function of the Gardens. A comprehensive indexing system, involving three different numbering methods is operated:

- All plants propagated receive an accession number placed on a label with the plants. The number is obtained from an accession book, which notes the plant name and cultural information.
- When a plant is settled in its fixed location, it receives a polycarbonate label which is inserted in front of the plant. The label notes the plant name, family and country of origin. On the back of the label is the stock number.
- An interim spreadsheet record of plant information is entered. This will eventually be transferred to a plant database.

(Note: The efficient running of a botanic garden hinges on the correct naming of the plants within its area).

Herbarium

The Gardens possesses two herbarium collections:

1. Armstrong Herbarium - dating from the 1880s.
2. The Gardens Herbarium (CHBG), with about 2,500 specimens.

The Armstrong herbarium is a valuable collection of New Zealand plants of great historical interest. It is currently housed on long-term loan at Landcare Research Lincoln, in lieu of satisfactory storage space being available at the Gardens.

The 'Metcalf' collection is housed in the Gardens library in boxes. It is indexed and available for staff use, although its presentation and storage is far from satisfactory. Little has been added to this collection over recent years.

The Gardens is currently listed on the New Zealand National Herbarium Network as CHBG. There are thirteen registered herbaria in New Zealand. (Note: A 'working' herbarium is an essential part of the running of a botanic gardens for the purposes of plant identification, research and teaching).

Plant display and maintenance

Plant display is one of the primary functions of the Gardens. The way in which the displays are organised is critical to public understanding and appreciation of the role of the Gardens in its promotion of the world of plants. Access to specialist botanical advice enables the Gardens to provide interesting and accurate display information to visitors.

Specialised skills and maintenance techniques are required to maintain many plant species. The Gardens' maintenance contributes to the best use of the Gardens' financial resources. If the specialist care is removed, the work of years can be lost very quickly due to ignorance about plants cultural needs and significance.

Science and research

Scientific research is one of the areas in which botanic gardens play an important role. From the first decades of European colonisation the Gardens was the main centre for botanical work in Canterbury with respect to plant introduction and acclimatisation (see Section 11 (History), Page 16).

In the 1870s, due to interest in growing better grass species in New Zealand, a collection of grasses from Vienna was reared by J.F. Armstrong for investigation by a committee of the Philosophical Institute of Canterbury.

Father and son, J.F. (John) and J.B (Joseph) Armstrong brought into cultivation a large collection of little known South Island plants and described more than eighteen new species. J.B. Armstrong also described the new genus *Corallosparticum*. The Armstrongs wrote nine scientific papers.

In 1871 J.F. Armstrong published the first list of naturalised plants of Canterbury. He was also instrumental in establishing the first Gardens' herbarium, a collection of national importance.

More recently, when Dr O.H. Frankel and Dr J.B. Hair were conducting their important research on the chromosomes of New Zealand *Hebe*, their collection of type plants was grown in the Gardens.

Little research has been done since the 1930s, when Mr W.B. Brockie collected and published many accounts of native plants. Some valuable work has been done with cultivars of *Hebe* and *Leptospermum* under Mr L.J. Metcalf, but has not been published.

This lack of research is, in part, due to the lack of a defined research function or formal association with educational, research and conservation organisations.

Education

Education is a key ingredient in the successful development and use of the Gardens and an important reason for their existence.

There are three main groups of people who make use of education opportunities in the Gardens:

- a) Casual visitors.
- b) Specialist garden groups.
- c) Schools, including universities, the Polytechnic and horticultural apprentices.

Educational materials

A guide map was first produced in 1963 and recently updated. A Gardens' general information brochure was printed in 1987, and publications are under continual review. The first of a series of self guiding brochures on the different sections in the Gardens was produced in 1989.

A second major aspect of public education is having all plants correctly identified and labelled. To help the Gardens' visitor find a particular section or plant, information stations have been installed at various points to show special features, new developments and general directions.

Lectures / Guided Tours

Since the early 1900s talks, lectures and guided tours have been given by Gardens' staff to the general public and specialist interest groups. Subjects covered have included plant propagation, bedding, natives, herbaceous perennials and pruning.

Staff currently are engaged in monthly talks, and the Friends are active in providing guided walks.

Information Centre

Construction of the Information Centre in 1987 was a significant step forward for the Gardens. For the first time, lectures could be held in the Gardens indoors, static displays could be used and brochures and information materials displayed.

Issues with the Information Centre

- The building has to double as both an information/display centre and retail outlet, and previously as a lecture hall, which is now no longer available.
- Space is taken up by sale items in the information centre, such as posters and paintings.

Lack of space however limits further expansion. The Information Centre was not designed as a retail outlet and lacks sufficient shelving and display areas.

Comment

The botanical basis of the Gardens provides considerable scope for educational programmes. Programmes can range in scope from basic horticultural to detailed propagation techniques at polytechnic/university level. The most appropriate means of assisting each group in their appreciation of the Gardens needs to be investigated. Assistance from educational institutions should be encouraged.

There is a lack of space for the following needed facilities:

- Education centre, incorporating classrooms and lecture hall.
- Study annex.
- Housing for the herbarium.
- Library.
- Permanent displays and exhibitions.

Currently, there is little scope for expansion in the Gardens to cater for the above functions.

Opportunity exists at the Gardens for considerable expansion of commercial activities. It is interesting to note that both the Australian National Botanic Gardens at Canberra and the Sydney Botanic Gardens have a bookshop selling botanical and horticultural books and souvenirs.

A most urgent need is for the updating of the information systems in the Gardens. Accurate and fast information access is a critical ingredient in the running of any institution and is essential if the Gardens are to be easily assist the public or exchange information on matters such as conservation with overseas botanical institutions.

The Gardens have research opportunities based on the diversity of plants grown. Research carried out at the Gardens could have commercial application for the nursery trade or amenity horticultural industry. Other programmes would have value in the conservation and management of New Zealand native plants in cultivation. Associations with the universities and other institutions should foster further research programmes in the future.

The current herbarium needs to be up to standard to increase its usefulness for plant identification. The potential size of the herbarium could be much greater than presently exists (2,500), such as up to 20,000 specimens.

Current relationships with other scientific institutions have major advantages for the Gardens. For example, these can assist with:

- a) Talks, lectures and tours of the Gardens.
- b) Exchange of, and access to, plant material.
- c) Writing tour guides for the Gardens.
- d) Plant identification and classification.
- e) Conservation of rare and endangered plants.
- f) Access to national and international herbaria.

Revenue generation

The Council, under the Reserves Act 1977, is able to grant leases or licences for the carrying on of any trade, business, or occupation in Recreation Reserves, provided the land is vested in Council and the lease or licence is in conformity with an approved management plan. The lease or licence must be necessary to enable the public to further benefit from and enjoy the reserve. The Section 23 classification of the area that is legally the

Gardens gives Council far greater discretion in this area.

There are currently two significant commercial concessions in the Gardens:

1. The Gardens Café.

The Gardens Café has been previously known largely as the Tea Kiosk. The original kiosk was built in 1910, but because of a fire was replaced in the 1920s.

2. Curator's House Restaurant.

The Curators house on Rolleston Avenue frontage is currently used as a restaurant. There is a site for the demonstration of culinary skills and gardening in the adjacent curators garden.

11. History

Pre-European history

The landscape of the Christchurch area developed during the post glacial formation of the Waimakariri River delta. This resulted in the formation of multiple layers of gravels interspersed with impervious layers of sediments which supported aquifers. Water feeding through the upper aquifers from the Waimakariri River led to the formation of the Avon River which flows around the Gardens.

The prehistoric vegetation patterns formed on the soil mosaic of the Waimakariri River flood plain probably varied from podocarp – hardwood forest, dominated by kahikatea, totara and matai on the imperfectly drained Kaiapoi soil series, to short tussock grassland on the drier Waimakariri soils. Swamps occurred on the poorly drained sites. Evidence of an ancient forest was recently discovered in Riccarton (Mandeville Street) where logs thought to be 3000 years old were excavated. The incidence and severity of floods and natural fires, combined with the prevailing climate, would have led to a changing vegetation matrix varying from forest to swamp to grassland on each site over many thousands of years.

Early Maori occupation of Canterbury probably saw an increase in large fires on the plains which would have affected vegetation of the Hagley Park area. By 1848, there were nine pas, two villages, three kaingas and several whares within a 12.8 kilometre radius of Cathedral Square. Whares were located at Settlers Corner across the Avon River from the Gardens at its northernmost extent. The Gardens were included within an area known as Putaringamotu by the Ngāi Tahu people. Putaringamotu means 'Place of an Echo'.

European settlement and the Gardens establishment

The vegetation in the vicinity of the Gardens at the time of European colonisation in the 1850s was characterised by short tussock grassland. A large swamp was situated in 1897 where Victoria Lake is today and the Avon River was thickly vegetated. An account of the Deans brothers first journey to Riccarton Bush up the Avon River gives an indication of the riverine vegetation in the Gardens area.

"...a Maori canoe conveyed the party to the bend in the river close to the present Riccarton Road. During the whole river journey the canoe had to be forced through a thick growth of vegetation by pulling on the flax and niggerheads. When the little party left the river a path had to be made through the dense "entanglement of fern, tutu, tussock, bramble, Spaniards, and other native growth, nearly breast-high."

In 1864 eighty eight native plants were listed as growing in Hagley Park and the Domain by Mr J.B. Armstrong.

One of two areas rich in New Zealand native plants was a large swamp, which was transformed into what is now Victoria Lake in 1897. The other is southern sandy shoulder of the lake. Another list compiled in 1918 by Professor A. Wall records thirty five native plant species growing in the Park and Domain, a reduction of fifty three from that recorded during the 1864 survey by Armstrong.

The exact reasons for the setting aside of Hagley Park as a public recreation area are unknown, however, by 1855, the superintendent of the Province was given authority to set aside what land he thought fit for plantations and gardens. A Reserves ordinance passed in 1856 declared that:

"the land commonly known as Hagley Park, shall be reserved forever as a public park and shall be open for recreation and enjoyment of the public."

Nothing official was done in the Government Domain, though, until 1864. Yet, an oak was planted on 9 July 1863 to commemorate the marriage of Prince Albert Edward to Princess Alexandra of Denmark. This tree, an English Oak (*Quercus robur*) recorded as the Albert Edward Oak, is regarded as the foundation date of what was a short time later to become the Gardens.

On 10 May 1864 a public meeting was held in the Town Hall for the purpose of forming the Canterbury Horticultural and Acclimatisation Society. It was decided at the meeting that Hagley Park was a good site to establish a botanic gardens.

A commission was set up by the Provincial Government to advise the Superintendent of the Province on the cultivation and planting of the Government Domain that was compatible with the objects of the Acclimatisation Society. A vote of \$1000 was made toward establishing the Gardens. The work was supervised by the Government Gardener, Mr Enoch Barker.

Enoch Barker was responsible for establishing much of the landscape character of early Christchurch. His first undertaking in the Domain was to establish a provincial nursery on a site nearly the same as that of the present Gardens nursery. Trees from this earlier nursery were used for general city planting including sections of the Avon River in 1862 and Fitzgerald Avenue in 1863. It is probable that trees for the outer belts of Hagley Park were also grown in this nursery.



Early last century

The Archery Lawn



Present day

Major developments carried out by Enoch Barker, until his resignation in 1867, included:

1. Supervision of the Acclimatisation Society's garden development between the Domain and Riccarton Avenue, and adjacent to the public hospital, in 1864.
2. Trenching of the Armstrong Lawn area approximately as far as the Pine Mound.
3. Development of flower beds and a shrubbery between the Pine Mound and the nursery.
4. Development of a linear grass walk, with shrub beds backed by a whitethorn hedge, on the inner side along the Avon River. Trees, including *Pinus pinaster*, blue gum and Weeping Willow, were planted on the river bank. This river walk is still in existence today. Altogether, Barker's developments were estimated to have cost 2,000 pounds.

During Barker's time the Domain was extensively used for the extraction of gravel for the city's streets. It is possible that the present design of the Archery Lawn arose because of the need to provide access for gravel carts in and out of the Domain.

Enoch Barker was also responsible for planting many of the older trees found in the Gardens, including the Albert Edward Oak of 1863.

In 1872 the first Christchurch Domains Board was established, pursuant to the Canterbury Domains Act 1872. Unfortunately, in 1876, all grants to the Domain were withdrawn due to the abolition of the Canterbury Provincial Council. The Board's activities were then needing to be wholly financed by rents, grazing fees and donations. In spite of the lack of funds, between the years 1870 to 1882, a total of 763,034 trees were distributed to public bodies in Canterbury from the Acclimatisation Society grounds. This was situated south of the Avon River near the public hospital.

This work was largely the result of the activities of Mr J.F. Armstrong (curator 1867-1889) and his son J.B. Armstrong. He is estimated to have introduced and acclimatised over four thousand different plant species. Most of these plants arrived in New Zealand by sailing ship, a voyage

of three to six months. They were packed in wooden cases and on arrival were plunged into the river behind the nursery to revive. Many failed to recover. The Armstrongs were enthusiastic collectors of native plants. One of their notable achievements was the establishment of the native section, which was originally sited in the vicinity of the present Herb Garden. Material from this section was used by many noted New Zealand botanists including Petrie, Cheeseman and Cockayne.

J.F. Armstrong was succeeded by Mr A.L. Taylor (curator 1889-1907). Trained at Kew Gardens in England, he had worked under Sir Joseph Paxton as head gardener at Chatsworth and was head gardener and estate manager to Baron Rothschild. However, the severe shortage of funds at this time severely reduced his ability to undertake many improvements. For example, in 1898, the Board's total income was 548 pounds but the wage bill alone was 573 pounds. In spite of this, he was still responsible for planting many trees and shrubs.

Various means were used to reduce costs, including use of prison labour in 1877 and personnel from the Charitable Aid Board. Revenue was also gained from sales of firewood, hay and shingle.

At this time watering of plants was a constant problem over the summer months due to the light texture of the soil and the restriction of the water supply in the Gardens to the Curators and caretakers houses. The young Edgar Taylor (son of the curator) records carrying water in four gallon tins some 300 yards (274 metres) to water young conifers in the Arboretum.

In 1900 a Magnetic Observatory was erected and a small section of the grounds fenced around it.

The modern era

Mr James Dawes replaced A.L. Taylor in 1907, but resigned a year later. He was succeeded by Mr James Young (curator 1908-1933). Several buildings and structures were erected during this time including:

1910 Tea Kiosk - The first tea kiosk was constructed on the current kiosk site near the northern entrance to the Gardens. It was destroyed by fire and replaced in 1923 and again badly damaged in 1979.

1911 Peacock Fountain - The fountain originated from a bequest by the Hon. John T. Peacock and a donation from the Christchurch Beautifying Association and located on the Archery Lawn. Due to maintenance problems it was removed in 1949. In 1996 the fountain was restored and relocated to a new site at the eastern end of the Armstrong Lawn near the entranceway to the Gardens off Rolleston Avenue.

1914 Townend House - The original Townend House stood in the grounds of Holly Lea. It was purchased with funds offered from the deceased estate of Mrs A.Q. Townend of Mona Vale. It was replaced by the current house in the 1950s.

1923 Cunningham House - The result of a bequest by Mr C.A. Cunningham in 1915, it is the most notable building in the Gardens.

1923 Bandsmen's Memorial Rotunda - The Rotunda was erected in honour of the Canterbury bandsmen killed in World War I. It is sited south of the Avon River in the woodlands.

1932 The Robert McDougall Art Gallery.

James Young created a new rose garden in 1909, an extensive herbaceous border, various shrub collections, the children's play area and a water garden in the old shingle pits on the south west side of the gardens. From 1914 through to 1930, garden fetes were held every year to raise money for the Domain Board. In 1917 the lime avenue known as Beswicks Walk was planted. In 1928, the Canterbury Acclimatisation Society relocated to Greenpark near Lake Ellesmere.

Mr James A. McPherson was the first New Zealand born curator of the Gardens 1933 to 1945. His contributions included the re-designing of the Rose Garden and the extension of the New

Zealand Section including the memorial dedicated to Dr. Leonard Cockayne. He was instrumental in the plantings of thousands of daffodils in the woodlands. McPherson was also responsible for the introduction of training horticultural apprentices.

In 1945 Mr Brendon P. Mansfield became curator, a position he held until 1948. The Christchurch Domains Board was disbanded by Act of Parliament in 1946 and Hagley Park and the Gardens came under the control of the Christchurch City Council. Mr Morris J. Barnett became director of Botanic Gardens, Parks and Reserves and was later followed by Mr H. Gilpin curator 1949-55. Improvements during this period included establishment of a rose species garden south of the Avon River, a new Townend House and a fernery.

Mr Lawrence J. Metcalf followed Gilpin as curator in 1955. He was responsible for redeveloping the Cockayne Memorial Garden, reforming the Erica Garden, extending the irrigation system, redeveloping the dwarf conifer garden, constructing the Rose Species and Primula Gardens. Metcalf also organised an education service for schools. His most important contribution was the introduction of a sequential numbering system for all incoming plant accessions, the cataloguing and tracking of them, and the redefining of plant label information.

Mr Alan G. Jolliffe was appointed curator from 1977 to 1979.

Mr Warwick J. Scadden was appointed as curator in 1982. Major developments in his time included the building of the Information Centre and development of herb and fragrant gardens and redesigning of the children's play area.

Dr David Given was appointed as Curator in 2003, after short tenures by Craig Oliver and Barry Samson, following Scadden's departure for another position. At the time of appointment of Dr Given as curator, Jeremy Hawker took the position of Botanical Services Operations Team Manager. Given was a key contributor to the development of new plans to guide the Gardens into the future, but passed away at the end of 2005, in the midst of this work.

Patterns of change

The Gardens today have developed as the result of the varying design inputs of the different curators, influenced by political and public initiatives, values, new plant introductions and fashion.

An analysis of changes to the circulation network illustrates the considerable degree to which the Gardens have changed over the last 135 years. An 1877 map shows that by this stage the path framework for the Avon River perimeter, Armstrong Lawn, Archery Lawn and the old New Zealand Section was fundamentally the same as the 1993 pattern. However, the central core of the Gardens at the earlier time had an entirely different circulation network that focused on an arboretum. By 1917 significant changes had taken place, with the central core completely redesigned to incorporate a large rectangular rose garden. The paths at the west end of the Archery Lawn were realigned, a bridge was built to connect the Gardens with North Hagley Park, the western bridge was shifted further north and the nursery shifted back to its original position.

By 1927 the central core had again been completely redesigned with the exception of the rose garden. Many of the major paths such as Beswicks Walk (Lime Walk) and the route from the existing western bridge to the Tea Kiosk were created in this period under the direction of James Young. The Gardens' three major ponds were also excavated in this period.

The next significant change to the Gardens design occurred in 1935 when James McPherson redesigned the rose garden into the circular shape still in existence today.

Utilisation of part of Hagley Park for botanic gardens purposes started in the 1930s with the planting of the Daffodil Woodland. The area between the Avon River and Riccarton Avenue slowly expands to include the Primula Garden and Heritage Rose Garden. A large number of ornamental cherries were also planted. From a 1958 map, the area of the Gardens was approximately 62 acres, ten acres more than the area later recognised as the Gardens under the Christchurch City (Reserves) Empowering Act 1971.

Changes since the Christchurch City Council took over administration of the Gardens in 1946 have generally been less obvious. The circulation network shown on the 1958 map has remained largely unchanged. Although change has been less noticeable, it has included a number of significant events, including:

- Removal of the Magnetic Observatory in 1960.
- Upgrading and redesign of the children's playground and Tea Kiosk area in the 1970s, 1980s and 1992.
- Removal of the Clematis Garden and replacement with a Herb Garden in 1985.
- Building of an alpine house later named Foweraker House.
- Building in 1960 of the Garrick and Gilpin Houses.
- Building of the Information Centre in 1987.
- Fragrant Garden – a 1990 project.

In addition, many trees have been removed from the Gardens, mostly due to death or ill health, and other trees planted. As trees have matured, and more and more lawn areas have been infilled with planting, 'open space' has been slowly reduced. New plant collections have been installed and others upgraded or removed.

Main points of change

1. The Gardens was subject to significant modification and periodic design change from its inception in 1864 till when it came under Council management in 1946.
2. Only part of the circulation system dating from the 1870s remains. This is along the Avon River margin and in the vicinity of the Archery Lawn, Armstrong Lawn and the old New Zealand Section.
3. The bulk of the circulation system has remained largely unmodified from 1946 to the present day.

4. Utilisation of part of Hagley Park for Gardens purposes dates from the 1930s.
5. Many of the current plant collections have plants originating from previous plant collection types still growing in their midst.
6. Changes to plant collections have occurred throughout the entire history of the Gardens. Overall planting and tree growth has infilled most areas of the Gardens to create a dominantly woodland aspect, thus reducing areas where higher light requiring plants can grow well. Tree root competition for water has produced localised dry spots.

Historical perspective and conclusions

The early design of the Gardens was strongly influenced by Victorian/Edwardian era park/garden design styles. This was a natural consequence of the English and Scottish garden estate training of most of the early curators. The evidence of these influences can be clearly seen in the following Garden features:

1. Expansive lawns with large numbers of specimen trees.
2. Extensive shrub borders.
3. Closely mown lawns punctuated with formal carpet bedding.
4. Specialist feature gardens such as water rose and rock gardens and the herbaceous border.
5. The over-riding motivation for amassing plant collections in the Gardens appears to have been horticultural interest although a few curators, such as J.F. Armstrong and L.J. Metcalf, were also interested in plant collection for scientific reasons. However, there was never particularly strong botanical emphasis, such as given in some Australian gardens with the presence of a state botanist.

A major influence on the nature of plant collections in the Gardens has been the requirement for the planting of commemorative trees. This has led to considerable duplication of tree species in the Gardens and diversion of

resources for the growing of plants for mass display and some general parks use.

Overall, there has been tendency to avoid a strong botanical and indigenous emphasis in favour of amenity and exotic horticultural plants being the main features of its displays. The institutional side of the Gardens has never developed the strong scientific function that is evident in some overseas botanic gardens, such as in Canberra or Kew. In spite of this, the Gardens is a significant botanic garden in the Australasian region and a crucial one in New Zealand, in terms of the range of its exotic plant collections. Overseas gardens have, however, developed a significant range of new functions and roles over the last thirty years in a search for modern relevance. This has not been mirrored to any degree with the Christchurch Gardens. Rather, there has been more of a response to local demands and values rather than to world trends. This is partially due to New Zealand's relative isolation from the rest of the world and the cost of sending staff to visit overseas botanic gardens and to attend international conferences. A lack of public understanding of the roles and functions of a botanic gardens has also had a major effect on the way the Gardens have developed.

12. Site structure and character

Existing environment

The Gardens constitute a large complex site continuously modified for over 140 years. In its present state, the main physical components are the:

- natural topography
- pattern of vegetation
- buildings and structures
- network of paths and driveways

The interaction of these elements provides the basis for the Gardens functioning and future planning. It also provides the framework within which visitors orient themselves and identify the visual character and botanical contents.

This section describes the main characteristics of this environment and analyses their inter-relationships. More detailed information on

specific features is provided in the following sections.

Topography

Prior to their development the Gardens was sited on low sand hills, extensive shingle beds and some swampy areas. The more prominent sand hills were situated near Rolleston Avenue, one on the site of the Museum, one where the Pine Mound is today and one in between.

Later, shingle pits occupied several areas in the Gardens including where the Armstrong Lawn and Water Garden are now sited. Shingle from these pits was used to build many Christchurch Streets.

The topography of the Gardens is generally flat, with a maximum height above sea level of 6.7 metres. The only significant topographical features are the steep banks of the Avon River, two old sand dunes (the Pine Mound between the Archery Lawn and Armstrong Lawn, and another pine mound in the northwest corner of the Gardens) and a river levee stretching from the Rock Garden to the Armstrong Lawn. A steep rise also occurs in a semi-circle to the south of the Bondmen's Memorial Rotunda near Harman's Grove in the Hagley Park part of the Gardens.

Soils

The soil in the Gardens proper is the Waimakariri fine sandy loam. It is also found under a small area of land south of the Avon River in the area of the Daffodil Woodland. Topography formed on Waimakariri fine sandy loam usually is flat with small ridges and hollows. The soil is fertile and free draining and retains moisture well, although it is subject to drying out during droughts. In the playground area, gravel has been found at a depth of forty centimetres below the surface. The potential of this soil for plant growth is increased with irrigation and incorporation of organic material and mulching. The part of Hagley Park treated as part of the Gardens, including the Pinetum, Harman's Grove and Daffodil Woodland areas, is situated on Kaiapoi fine sandy loam. The Kaiapoi soil series has its origins in the post glacial alluvium and occupy an intermediate position in the landscape between Waimakariri soils on the present and former river levees and

the Tai Tapu soils in the low-lying basins. In its natural state, Kaiapoi fine sandy loam is very free draining, fertile with adequate moisture in most seasons and has a high water table after rain and in winter.

Within this overall soil pattern, there are many local variations based on topographical features and the amount of soil improvement that has been undertaken. Dense areas of trees tend to create drier conditions due to strong competition for water.

Climate

(*Statistics are from the Christchurch Botanic Gardens Meteorological Station (others are from other stations in Christchurch)).

*Air Temperatures (1969-1998):

Mean daily minimum (Jan):	12.2 °C
Mean daily minimum (July):	1.7 °C
Mean daily maximum (Jan):	22.5 °C
Mean daily maximum (July):	11.3 °C
Lowest temperature (August 1980):	-7.1 °C
Highest temperature (7 February 1973):	41.6 °C

*Mean Annual Sunshine Hours: 2,000 hours

*Mean Annual Rainfall (1969-1998): 635.00 mm

*Snow: Occasional falls are experienced, but generally they do not lie on the ground for more than a few hours. The heaviest snowfall recorded was 269.5 mm (14 July 1945).

*Frost (1969-1998): Average number of days of screen frost (with a minimum air temperature of less than 0°C) is 29 per annum.

Average Relative Humidity:

Jan:	3.00 am - 83%	July:	3.00 am - 88%
	3.00 pm - 57%		3.00 pm - 70%

Wind:

Average number of days with gusts reaching 63 km/h or more is 55 per annum.

Average number of days with gusts reaching 96 km/h or more is 2.5 per annum.

Generally, the climate is conducive to the growing of a wide range of plants of temperate zone origin. The only constraints are the possibility of summer drought and the occasional high velocity wind and/or snowfall, which may damage trees.

Wildlife

Hagley Park and the Gardens, with their abundant vegetation, form an important refuge for wildlife in the inner city. During the year, up to forty species of birds visit or reside in the Gardens.

Some interesting aspects of the Gardens avifauna are:

1. The Gardens probably supports the largest breeding population of New Zealand Pigeon in the Christchurch metropolitan area.
2. Acorns from oak trees provide a source of food for the ducks.
3. Many of the ducks breed in trees, some of them well above (nine to twelve metres) the ground!
4. There are high numbers of blackbirds and thrushes.
5. There is a very high duckling mortality – the duck population is bolstered with ducks from elsewhere.

Other forms of wildlife living in Hagley Park include rats, possums and wasps. Stray cats and dogs are also sometimes evident and, when captured, are taken to the SPCA or dog pound.

The invertebrate fauna of the Gardens has been recorded in a twenty four hour Bio Blitz. This needs to be ongoing.

Avon River

The Avon River was originally a small stream that meandered through dense growths of flax and sedges. By the 1870s the river was cleared of much of its former vegetation. Public bathing (for men) was popular with the official bathing area opposite the propagating sheds. Thinning out of the trees and formation of a path along the banks put a stop to this practice. Swimming suits

apparently were not commonly used. The Avon River is a major feature of the Gardens. Its tree lined banks are attractive throughout the year.

The Avon River defines the shape of the Gardens by its loop and at no point is any part of the Gardens more than 180 metres from the river bank. The river is by far the most important natural physical feature of the Gardens site, adding greatly to its aesthetic, recreational and environmental value. The three bridges over it provide attractive views up and down stream and are, in themselves, important as landmarks and entry-points. The most extensive view of the river is obtained from the high bank above the bend adjoining Riccarton Avenue.

Though accessible almost everywhere, the attractions of the river bank are somewhat diminished by its height and steepness, artificially maintained in some places. This disadvantage is emphasized by the river bank walk which clings rigidly to the river alignment, leaving little level ground for seating, picnicking or group planting.

The steep river bank profile also inhibits establishment of a natural riverine vegetation character. Concrete block retaining walls have been built to help stabilise the edges where river erosion has occurred.

This erosion can be attributed to the natural dynamics of river flow combined with the lack of stabilising vegetation along the banks and boating activities. While the walling of the river edges is satisfactory in some areas, it is unfortunate that the natural banks are being lost.

With its change in direction of flow, the river provides varying microclimates – the north facing bank slopes are warmer, drier and sunnier and the south facing slopes generally cooler.

Hydrology

The Avon River flowing around the Gardens proper is well contained by generally high banks. The river varies in width from approximately twelve metres at its narrowest to 23 metres at its widest. Its depth ranges from ankle deep to over a metre deep.

Water flows vary from a normal low flow discharge of approximately 1.5 cubic metres per second (1.5m³/sec) to 20m³/sec during floods. A flood discharge of 25m³/sec is likely to be the maximum flow expected in the river (pers. comm., D Carver 1990). A 20m³/sec flood could be expected to raise the water level above the half metre high river edge and onto the grassed banks which slope up to the first river levee. Deposition of river silt on the banks is likely to be the greatest consequence of flooding on the Gardens. River velocities are not sufficient to have a serious affect on bank stability, although undermining of rockwork along Addington Brook has occurred (see below for more description of Addington Brook). Although overall water flow in the Avon River has probably increased over the last century, due to increased urbanisation, peak flows are relatively stable. Design constraints in the river's catchment restrict the peak discharge volume entering the river.

The possibility of a flood from the Waimakariri River reaching the Avon River, as it did in 1868, is very remote. With current river protection works in place, a flood of the magnitude required (5,500m³/sec with a probable return period of 1 year in 3000) is unlikely to occur. A proposed ten year programme of secondary protection works will further reduce any chance of this type of flooding occurring.

Two main tributaries flow into the Avon River through Hagley Park. These are Riccarton Stream and Addington Brook. Riccarton Stream enters the Avon River near the river's southern bend. The Riccarton Drain, which joins Riccarton Stream at Deans Avenue, has a maximum discharge of 7m³/sec. Addington Brook enters the Gardens near the public hospital.

The general quality of water in the Avon River is very good. However, samples taken in Addington Brook and Riccarton Stream in 1984 show that occasional high levels of faecal coliform bacteria can occur at times. These mostly appear to occur after storms.

Fauna and Flora

The only relatively unmodified gravel bottom occurring close to the Gardens is in a section of the Avon River between the Armagh Street

Bridge and the North Bridge. This provides a greater diversity of habitats than the muddy river bottom that is prevalent along other stretches of the river in the vicinity of the Gardens.

Spatial structure

The Gardens are nominally structured with a series of lawns separated by belts of trees or shrubbery. Tree growth and planting have, over many decades, encroached on these lawns to the point where most of them comprise semi-closed or closed canopy woodland rather than open space. Of the dozen or so named lawns, only the Archery Lawn maintains a coherent structural character, enhanced by the impressive specimen trees bounding it. The Armstrong Lawn retains a flavour of Victorian formality by virtue of the clearly defined building and street boundaries rather than the disposition of trees. On a smaller scale, the Rose Garden has a geometrical shape identifiable only from within. The north-south axis of this, aligned with the Cuninghame House, creates a tentative structural feature in the centre of the Gardens, but has not been integrated with the main traffic flows.

Ponds provide another category of open space. The lily pond near the southwest corner of the Gardens is the only one not enclosed by shrubbery and complements the Rock Garden and Harper Lawn to form a very attractive area of the Gardens. Elsewhere, the confining fringe of vegetation tends to neutralise the potential contribution of the ponds to visual structure and orientation. This applies, for example, to the main pond by the Gardens Café. The water surface here provides a focus for the northern entry area, but is effectively invisible from elsewhere in the Gardens.

With the exception of the Archery Lawn and Beswicks Walk, tree groupings do not generally form identifiable features, although individual trees do serve to identify particular locations and thus aid orientation. Spatial form is largely determined by the disposition of shrubby vegetation at and above eye level. Such vegetation is at its densest in three main areas - at either end of the Archery Lawn and in an extensive western belt that includes the native section. Where the path network is uncoordinated, these are the zones

most likely to create confusion and disorientation for visitors.

Given that the essential purpose of the Gardens layout is to allow its contents to be seen and understood, open space is required in order that vegetation groupings and dimensions can be appreciated. It is important that shrub areas do not become so wide that specimens in the centre become invisible and inaccessible. Similarly, very tall trees grown as individual specimens require open space of corresponding proportions if their size and character are to be readily apparent. Some parts of the present layout, particularly in the central parts of the Gardens, are unsatisfactory in this respect. Future planting programmes must be designed to achieve a better three dimensional balance and a more appropriate setting for important individual specimens or groups.

Landmark features

Even if the existing pattern of vegetation was reorganised to provide a more systematic layout in botanical terms, this would not necessarily create a clear visual and spatial order. There are however, other components of the landscape that can serve to aid visitor orientation. As noted previously in this management plan, the Avon River corridor is the most important of these, particularly where intersected by access routes at the three bridges. Other features serving as identifiable landmarks include buildings and other artefacts visible from a distance, particularly those defining an axis or associated with a major open space. The following list records the major landmarks in the present structure of the Gardens.

Rolleston Avenue Frontage



The street frontage links the Gardens with the street grid of the city centre, emphasized by the

placing of the three 'founding fathers' statues to terminate the east-west street vistas. The transparent metal fence enhances the effect, allowing the street space and Armstrong Lawn to register as one, framed by the solid stonework of the Museum and Arts Centre.

Peacock Fountain

See Page 43 for information on this.

Robert McDougall (ex-art gallery) building



Though oriented at an awkward angle unrelated to its surroundings, the previous Art Gallery building serves to identify the transition zone between the Armstrong Lawn and Archery Lawn. The nearby Eveleyn Couzins Memorial serves to reinforce the landmark value of the area, but is not integrated into the path system.

Cunningham House

Of the central complex of conservatory and service buildings, the Cunningham House dominates by virtue of its height. Its north-south axis, extended towards the rose garden, forms a focal point in the generally east-west alignment of the Gardens paths. Its landmark value is reduced by the lack of any adjoining major open space.

Gardens Café (Tea Kiosk)

Apart from its function and location, this building's distinctive shape identifies it as a focal point in the Gardens.

Paddling Pool/Playground

Located in a major open space, this complex is a significant focal point.

Bandsmen's Memorial Rotunda

The circular shape and discreetly formal character of this structure in North Hagley Park effectively creates a landmark, though it is one that is well integrated into its surroundings. It is significant in being the only one in the Gardens/Hagley Park area that is clearly visible from Riccarton Avenue.

Rock Garden

The intrinsic visual interest of the Rock Garden is greatly enhanced with the exploitation, to maximum advantage, of the modest difference in level along a river terrace.

Curators House Café and Restaurant

The Curators House, which is the refurbished original 1920s residence of the Gardens curator, became a restaurant and demonstration fruit and vegetable garden in 2000. See Page 42 for more information.

The path system***Significance***

Pathways normally mark the most convenient route between two fixed points. A path may link a number of points in a predetermined sequence, and may also serve to define a boundary or margin.

The network of paths in the Gardens is required to meet all of these criteria and, in addition, provide the basic framework for use and physical ordering of the Gardens. Due to the Gardens' size and complexity, and because visitors are not confined to the paved routes, the path network's function of allowing easy physical access is less important than its role as an intelligible grid of guidelines and orientation points by which the visitor can navigate.

Structure

The present path layout is the end result of a series of major re-arrangements imposed on the Gardens during the first eighty years of its existence. Since passing into the management of the Christchurch City Council only minor adjustments have been made to the path system, notably around the

Gardens Café/Tea Kiosk. The main elements of the network are (from east to west):

- A formal grid reflecting the street network, which dissolves into irregular curves in the zone between the museum and the river.
- A riverside walk closely following the bank from the Armstrong Lawn to the North Bridge.
- The parallel paths framing the Archery Lawn.
- In the central area, a complex of mainly straight routes that have no discernible logic, apart from the axis through the Rose Garden.
- In the south-western pond zone, a labyrinth of narrow twisting paths following the shorelines threading through the native section.
- Paths on the south side connecting Riccarton Avenue to the Woodland Bridge (the Pinetum area has no formed paths).

A significant feature of the system is the river boundary, which effectively controls access to the central area. Apart from the Rolleston Avenue gates, traffic is channelled across the bridges, and internal movement originates at those points.

Traffic patterns

Visitor movement tends to reflect the east-west alignment of the river loop. Heaviest pedestrian traffic concentration is on routes between Rolleston Avenue and the North Bridge (which serves the Botanic Gardens Car Park), giving access on the way to the conservatories and the Gardens Café. Less use is made of the Woodland Bridge as an entry point to the core of the Gardens, but the West Bridge and adjoining United Car Park attract significant visitor numbers.

Most people travel to the Gardens by private car (58%). The second largest group walk (24%), 12% travel by taxi.¹⁰

The following table shows preferred parking location in order of preference.

¹⁰ Opinions Market Research Limited Visitor Audit and Profile Exercise Botanic Gardens 2004.

%	Location	Some specific examples of path network failings:
49.0	Botanic Gardens Car Park (off Armagh Street entrance to North Hagley Park)	<ul style="list-style-type: none"> Beswicks Walk is the most impressive pathway in the Gardens - a formal avenue occupying a twenty metre swathe near the centre. The alignment, though, is unrelated to any existing feature and the avenue tails off uncertainly at either end.
22.2	Rolleston Avenue	
15.9	United Car Park	
10.6	Worcester Street Car Park	<ul style="list-style-type: none"> Gardens vehicle movement focuses on the service yard, which is poorly located for external access. The lack of a vehicle entrance across the river near the depot results in service vehicles driving through the centre of the Gardens from the West Bridge to get to the depot at the back of Christ's College. Thus, the current pattern of sealed routes tends to reflect vehicle circulation rather than visitor movement.
2.0	Riccarton Avenue	
	(B.G. Rooke 1985)	

The path network must also accommodate service traffic, including routine maintenance operations and delivery vehicles.

Deficiencies

Given its crucial role in providing an intelligible structure for the Gardens as a whole, the present path network is seriously deficient in several respects.

- It has no overall structure, but instead comprises a patchwork of uncoordinated routes laid out at different times for different purposes.
- It does not adequately reflect either the current patterns of public use or probable future needs, particularly in the width, alignment and surfacing of paths.
- It is extremely complex and disorienting for visitors unfamiliar with the layout. Confusing junctions, arbitrary alignments and inconsistent path sizes, surfaces and details all contribute to the general incoherence.
- It provides no clearly identifiable routes by which a visitor with limited time can quickly see what he or she wishes to see.
- The entrances to the Gardens are either poorly located, functionally inadequate or require visual upgrading (Note: The northern entrance has been upgraded).

- At the western end of the Archery Lawn, where the Gardens are at their narrowest, vegetation screens the view ahead for visitors proceeding westward and confusion is created by arbitrary path alignments. The only path carrying through in a straight line (that on the south side) shows no identifiable goal other than another distant screen of vegetation.
- Though the site has an attractive frontage of over two hundred metres on Rolleston Avenue, the effective main entrance is squeezed against the corner of the Museum, suggesting that the Gardens are merely the backyard of that institution.
- Apart from the area near the Gardens Café, nowhere in the Gardens is there adequate paved access to the waters edge allowing space for seating as well as uncongested traffic movement. By following the river bank too closely the riverside walk also inhibits the use of the riverbank for picnicking, grouped seating and a variety of planting arrangements.

Comment

A botanic gardens is, amongst other things, a living museum. The value of any museum depends not only on the nature of its contents, but on their accessibility and on how well they are

displayed. A visitor should without difficulty be able to:

- identify where any particular item is displayed.
- be able to find it.
- identify it when found.

In the case of the Gardens, the last of these three requirements is essentially a matter of labelling. The other two depend primarily on a rational layout in which plant collections, access paths and other features form a coherent intelligible pattern, analogous to the rooms and corridors of a museum building.

At present the Gardens, as a whole, do not exhibit a basic structure of this kind. While many of the individual plant collections are skilfully designed, the overall pattern is essentially haphazard, being the product of piecemeal development in the past. Similarly, the path network over much of the Gardens is arbitrary and confusing, bearing little relationship to current facilities and traffic patterns. Even when aided by a map, visitors to the Gardens are likely to become disorientated and frustrated when seeking a particular item of interest.

A fundamental aim of the management plan is to address this problem by mapping out a spatial structure in which every component of the Gardens can be given a logical place. The creation of such a structure is necessarily constrained by what exists on the ground at present; nevertheless the aim must be to ensure that future physical changes, whether planned or otherwise, serve to clarify, rather than confuse, the logic of the Gardens layout.

Future development should include consideration of how the existing circulation and spatial structure might be integrated with Garden features. It must also address the problem of creating greater intelligibility in the large areas not related to existing landscape features that can aid orientation. This may require strategic location of new structures or features, careful disposition of new planting, adjustment to the network of paths, or some combination of these measures. Adjustment to the path system is the easiest to

achieve in the short term and is, in any case, required due to its current deficiencies noted above. Further bridges are required to encourage greater public use of underutilised parts of the Gardens and to facilitate improvements to vehicle circulation patterns.

Due to its essentially flat topography, the Gardens lacks any high viewing point to enable visitors to gain an overall impression and pick out the strategic features. Guide maps do not entirely address this deficiency since many people have difficulty in interpreting maps. Identifiable landmarks are therefore essential and must form a network covering the whole Gardens site.

13. Plant Collections

The Gardens contain one of the most important collections of exotic and indigenous plants in New Zealand. These include many shrubs, trees and herbaceous plants not commonly seen in commerce or private gardens.

Trees

The single most important factor contributing to the character of the Gardens is the large number of mature trees that occupy most areas. Many of these trees are now over 115 years old with the oldest recorded specimen now approximately 145 years old. Some of these trees are of national significance due to their large size and or rarity. Many more are of regional significance. For example, the alpine ash, *Eucalyptus delegatensis*, growing behind the Rock Garden, with a trunk diameter of 2.79 metres, is the largest of its species in New Zealand and, due to its trunk size, probably one of the largest of its type anywhere (Burstall, 1984). A Westfelton yew, *Taxus baccata 'Dovastoniana'*, situated on the Central Lawn, now over 110 years old, is one of only two of this variety recorded in New Zealand. It is already large and visually significant and can be expected to live for a considerable time (Burstall, 1984). In addition, many of the trees were planted by members of the British Royal family, Governor Generals, Presidents of Rotary International and other distinguished people.

However, as the large trees have matured several problems have emerged. Many of the trees are planted quite close together and, as root systems have expanded to support the growth of the tree, severe competition for water and nutrients has arisen.

The relatively shallow depth of soil in some parts of the Gardens, being over gravel layers, compounds this problem. With many of the large trees, feeding roots extend for considerable distances beyond the crown of the tree. As a result of these factors, many of the large trees in the Gardens are now in a stressed state, which makes them especially vulnerable during periods of drought and possibly less resistant to disease. The current Gardens irrigation system is not adequate to compensate for very dry periods with the watering of the trees.

The relatively even age of most of the larger Gardens specimens, which range from 90-130 years in age, will probably mean many of these trees will eventually die within a short space of time of each other. This would result in large gaps being created over many areas of the Gardens as there are still few semi-mature trees to take the place of the mature specimens. It is only in recent years that replacement trees have been planted in larger numbers. However, their growth is often hampered by root competition and shade from existing trees.

The optimum solution for replacement planting would be to prune back or remove existing trees to create light gaps for the young trees, yet this has not been an acceptable option to date. The life expectancy of exotic trees in New Zealand is still not fully understood, as most existing large trees are part of the first generation to be planted. Experience in Hagley Park and around the city however indicates that tree life expectancy may be much lower than the maximums experienced in their natural habitats.

Within the Gardens, there is still the opportunity to plant a greater number of different species as there is currently considerable duplication of tree species in the range of mature and semi-mature trees.



Cuningham House (*Collection category – Tropical Plants*)

The main tropical plant collection is housed in the Cuningham House, which was opened in 1923. It was built as a result of a bequest by Mr C.A.C. Cuningham.

The Cuningham House is divided into two main sections - a lower house on the ground floor and an upstairs gallery. High light requiring tropical plants are grown on the upstairs gallery, while those requiring lower light levels grow on the ground floor. The central ground floor portion also allows growth of the taller species.



Townend House

Overall, some 13 families, 63 genera and 223 species, varieties and cultivars of tropical plants are grown in the lower Cunningham House. Generally, each bay on the ground floor contains a different genus.

Notable collections in the lower Cunningham House are the palm collection (over thirty species), the *Philodendron* collection (over 48 species), the *Peperomia* collection (over sixty different species) and the *Dieffenbachia* collection (with over thirty different species)

Townend House

(Collection category – Cool Flowering House)

A succession of popular greenhouse plants are displayed in the Townend House, which was built in 1955-56. The Townend House is linked to the Cunningham House by a covered access-way.

Plants featured in the Townend House include *Primula malacoides*, *P. obconica*, cinerarias, cyclamens, coleus, schizanthus, pelargoniums, tuberous begonias and chrysanthemums. Various cooler climate orchids are also displayed when in flower.



Cunningham House

The upper House contains 34 families, 109 genera and 569 species, varieties and cultivars of light-requiring tropical plants. Notable collections here are for *Pilea* (ten species), *Hoya* (69 species), *Ficus* (27 varieties) and *Tillandsia* (20 plus varieties).



The pot plants required for the displays are all raised in the Gardens propagating houses. Generally, the aim of the displays in the Townend House is to grow collections of indoor flowering plants that would grow in Christchurch. Approximately 25-30 displays are featured each year, with up to fifteen varieties of plants in each. Plants are sprayed once a month to keep them disease and pest free. Over the cooler seasons the house is heated to 13-15°C.

Garrick House



(Collection category – Cactus Collection)

Situated immediately to the west of the Townend House is the Garrick House, built in 1960. The house is named after Mr M. Garrick, who donated a collection of cacti and succulents to the Gardens. The current collection consists almost entirely of cacti species, succulents are stored in the adjoining nursery. The collection contains approximately 900 species of cactus which makes it the most extensive public authority display in New Zealand. However, by private collection standards the collection is quite small. A feature of the display is the desert diorama which forms a backdrop to the desert garden display (see right). This was created in 1958.

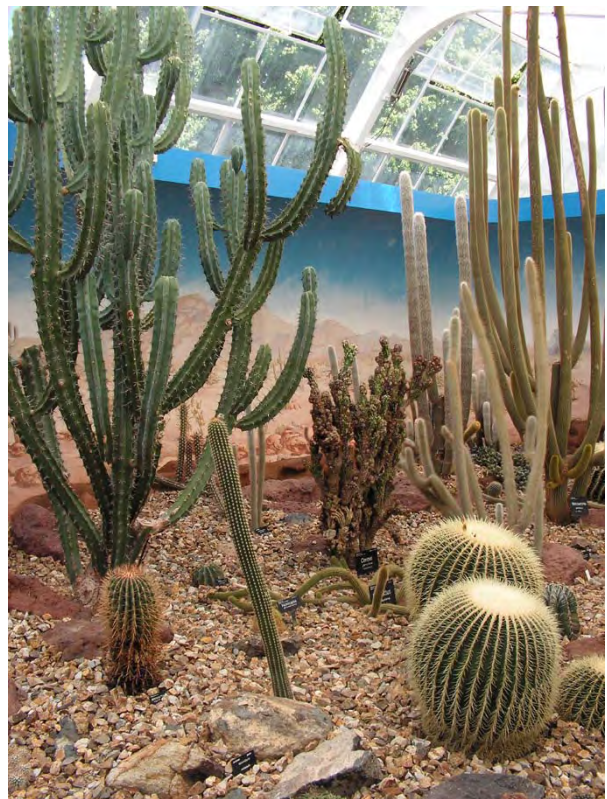
Smaller potted specimens on a raised bench are divided into two groups - North American Species and South American Species. Many of the cacti on display are quite difficult to grow. All are well labelled, some are very rare. Generally, only one representative of each species is grown. All the potted cacti are re-potted every year. The cactus house is only heated in winter when the

temperature is maintained above 1-2°C to prevent frost damage to some species.

Security for the cactus collection has been a major problem. Placement of a metal grid between the viewing glass and the roof has reduced theft and vandalism of the potted collection. Steps are being taken to prevent damage to the desert gardens by vandals.

The overall aim of the display is to educate the general public about cacti – about their diversity, country of origin and ecology. These aims are only partially fulfilled at present. At present, the desert diorama gives an idea as to one type of environment that some cacti live in.

Much more could be done in this respect. For example, few people know that some cacti are covered by snow in winter, grow at high altitudes in the Andes or grow by the seashore. Unfortunately, space in the Garrick House is very restricted and some expansion is required to give scope for a better display.



Gilpin House



(Collection category – Orchid/Carnivorous Plant Collection)

The Gilpin House was built in 1960. It was originally used to house the bromeliad collection, which has now been transferred to the Cuninghame House. A range of orchid and carnivorous plants are part of the feature display in this House.

Foweraker House

(Collection category – Alpine Plants)

The Foweraker House contains a potted collection of native and exotic alpine plants that require protection. This is because of these plant's dislike of overhead watering, and is necessary to protect their flowers from the elements, to provide specialised soil conditions or because the plant's small size does not suit them to be growing in the main Rock Garden.

Different plants are displayed in the House throughout the year to provide variety and interest. The security grills, installed to reduce plant theft, unfortunately detract from the display. The Foweraker House display is limited by lack of space. The small planted bed to the north of the House is currently planted with an assortment of rock garden plants.

Bonsai collection

A small collection of bonsai plants is contained in a shade house behind the nursery. The location of this collection means it is missed by many visitors. Theft has been a problem.

Fern House



The Fern House was constructed in 1955 from bequests made by Mary Rothney Orr and James Foster. It enables growth of a number of New Zealand ferns that would be difficult to grow outdoors. Several large ferns are contained in the House.



Specific groupings and gardens

Pine Mound

Planted in the early 1870s is a group of *Pinus pinaster* trees, which forms a distinctive feature accentuated by their position on the old sand dune at the eastern end of the Archery Lawn.

These trees on the Pine Mound are mature, maintaining foliage only at the very tops of the trees. For safety reasons, the dead branches have been removed up the whole length of the trunks. Despite this the attractive colour of the bark and the strong visual character imparted by these tall pine groups makes them a significant feature of the Gardens. The greatest threat to the pines is wind damage, which has claimed several trees in the last few years.



The slopes of the Pine Mound feature a microclimate in which a selection of half hardy South African plants (mostly from the *Proteaceae* and *Ericaceae* families) grow well.

Cherries

There are numerous individual cherries trees placed around the Gardens. There is, however, two groups of trees that are worthy of special notice. These are the cherries along the Riccarton Avenue frontage (*Prunus yedoensis*) and the Japanese cherries on the Cherry Mound. Some of the cherries may be of conservation value, originating from a Japanese importation.

Eucalyptus Group

The trees in the *Eucalyptus* group behind the Rock Garden are mostly in good condition. The group contains an imposing specimen of *Eucalyptus delegatensis*. The rest of the group have not been named. These trees comprise the sole survivors of what was noted on a 1927 map as the Australian Section.

The Rock Garden



Spring and early summer are the times of greatest floral display in the Rock Garden. This popular garden feature was first established in 1917 and extended in 1922. The current version of the garden was opened by the Governor General, Lord Galway, on 27 October 1939.

Situated on the northern side of the Harper Lawn, it has an ideal position on the southward facing slope for the growth of many alpine plants.

Adjacent to the Rock Garden are many *Rhododendron* species and hybrids with their associated plants of hostas, hellebors and lilies. These, together with other *Rhododendron* collections in the Gardens provide a special focus for this genus.

Erica and Heather Garden

This garden features an assortment of *Erica* and *Calluna* cultivars. The similarity of plant form and flower colour between these helps to create a harmonious whole and makes this garden an attractive compliment to the adjacent Rock Garden. An opportunity may exist to introduce conservation planting of species of *Erica*.

New Zealand Section

Extending from the Water Garden to the Avon River in the south, and to Beswicks Walk in the east, the New Zealand Section features native trees, shrubs and herbs.

This area could easily be overlooked by visitors who are not familiar with the general layout of the Gardens. It is one of the most important feature areas of the Gardens, particularly for tourists, but because of its position it lacks prominence.

The section is divided into two main parts - the Cockayne Memorial Garden, which was opened in 1938 as a living memorial to one of New Zealand's greatest botanists, and the bush area, where plants have been established to grow naturally. The Cockayne Garden also has two sections - a sub-alpine garden featuring plants collected from the mountain regions of New Zealand and a more formal section containing beds of shrubs and small trees in a lawn setting. The collections in this area are in need of refurbishment and enhancement.



The New Zealand Alpine Garden, though, has experienced environmental changes in its growing area. The large beech trees to the north shade the garden extensively through the year, except during mid-summer, and poor drainage in winter

and heavy soils are limiting factors. Yet, soil amelioration over recent years has improved growing conditions and a wider variety of plants can now be grown.

The general condition of most of the trees in the native bush section is good, although the die-back of *Hoheria*, from natural causes, is a problem here as it is in other parts of the country. In a closely planted area meant to represent natural forest conditions, the competition for light is such that some trees have become drawn up and other suppressed by the canopy of the larger trees.

The New Zealand Bush Section contains a fairly wide range of trees that are suited to the Christchurch climate, but most appear to be in random plantings where there has not been consideration given to grouping trees and other native plants together in a way that accurately depicts the natural plant associations found in the wild.

Azalea Garden

Between the Water Garden and the children's playground is an area known as the Azalea Garden. Large beds of *Ilam hybrid mollis azaleas* are situated in a semi-woodland setting under the canopies of mature oak trees (*Quercus robur*). The *azaleas* usually flower around mid October. The flower show provided by the *azaleas* is extended through having numerous magnolias planted throughout the beds - *Magnolia kobus*, *M. soulangeana* and varieties, *M. campbellii* (one of the highlights of the spring gardens) and *M. wilsonii* and *M. sieboldii*.

Beswicks Walk, Lime Avenue

An avenue of lime trees (*Tilia x europaea*) was planted in August 1917. These trees are especially attractive in autumn when the leaves colour yellow. All specimens along the Walk are in a healthy and sound condition and co-exist with attractive crown ferns. Apart from some minor pruning to lift the canopy to preserve the pedestrian sight line between the trees, little maintenance work is required.

The integrity of the Walk is compromised to some degree by plantings of *Ginkgo biloba* at the driveway intersections of the walk. The

considerable difference of this species with the crown fern detracts from what would otherwise be a totally uniform avenue effect.

Rose Garden



The rose garden is situated in the centre of the Gardens and is one of the most popular attractions.

The present circular layout, enclosed by a Yew hedge and with radiating paths, dates from 1936 during the time of James McPherson as curator. It replaced an earlier and larger rose garden started in 1909 by James Young. The earlier rose garden was reputed to have been the largest in Australasia.

The 1936 rose garden originally featured a circular pool in the centre. This was later replaced by the Thomas Stevenson sundial, constructed of Halswell stone with a black marble top.

The roses are displayed in such a way that visitors can see examples of those most suitable for their own garden requirements. The Rose Garden presents a very attractive picture during the summer months.

Fragrant Garden

The fragrant garden is sited on the west side of the Cuninghame House.

Australian Border

The Australian Border contains several large eucalypt trees, some of which require identification. The collection is generally well presented and features many Australian plants not normally seen in Christchurch.

The Herb Garden



The Herb Garden was constructed in 1986 on the site of the former Clematis Garden and was refurbished from 2005 to 2006. It contains an extensive range of plants used for culinary and medicinal purposes.

Maples

A significant grove of Japanese maple cultivars (*Acer palmatum*) forms an attractive feature situated at the western end of the Herbaceous Border and Archery Lawn. The plants were originally donated by Nairns Nursery in Christchurch and require identification and naming.

Herbaceous Border



Through summer and early autumn the Herbaceous Border features a continual display of flowering perennials. The border is 159 metres long by 6.4 metres wide and is divided in the middle by a paved area containing an old sun dial and stone seat. The sun dial was presented to the Gardens by the Superintendent of Canterbury, William Rolleston, in 1873.

The Herbaceous Border contains species and varieties of herbaceous perennials.

The Herbaceous Border is a feature worthy of protection, not only from an historical and visual point of view, but also because it contains such a large collection of herbaceous plants not commonly seen in modern times.

Heritage Rose Garden



The Heritage Rose Garden was established in 1952 and redeveloped in 1999-2000. Situated on the south side of the Murray Aynsley Lawn, adjacent to the Christchurch Hospital grounds, this garden contains a collection of rose species, hybrids and varieties commonly cultivated in the 18th, 19th and early 20th centuries.

Primula Garden

The Primula Garden was formed in 1955 on the banks of Addington Brook where it flows across North Hagley Park from under Riccarton Avenue to the Avon River past the Murray Aynsley Lawn.

Stream bank levels have been altered to provide conditions for the growth of candelabra *primulas* and other plants suitable for moist soils. Some of the species grown are *Primula japonica* and its varieties, *P. bulleyana*, *P. burmanica*, *P. pulverulenta*, *P. beesiana* and *P. alpicola*.

Pinetum

An interesting collection of pines and other conifers is located in Hagley Park between the Avon River and the United Car Park.

The collection appears to have been planted after World War II. Until 1961 the southern portion of the Pinetum was used as a rubbish dump. This was cleared and grassed.

Most trees are in a good condition.

The *Pinus pinea* group was planted in 1963 to commemorate the centenary of the Botanic Gardens. Apart from the possibility of planting along the river bank, there is little space available for increasing the numbers of tree species in the Pinetum.

Sequoiadendrons



Large *Sequoiadendron giganteum* trees line the edge of the United Car Park. They are one of the main features in the Gardens. The construction of the main driveway from Riccarton Avenue and the adjacent United Car Park was undoubtedly the principal cause of the progressive decline in the condition of the trees through drainage to the trees' root systems.

Armstrong Lawn

The Armstrong Lawn contains well spaced specimen trees, deciduous and coniferous, and includes an excellent specimen of *Fagus sylvatica* 'Asplenifolia'.

Little opportunity exists for further tree planting without spoiling the view across the lawn and constricting existing tree growth.

River Border

The River Border runs parallel to the Archery Lawn, from the Armstrong Lawn to the Cherry Mound. It contains a miscellaneous collection of shrubs and small trees

Chinese Border

The area known as the Chinese Border is a curved area to the west of the Maple Grove and contains a few Chinese species mixed together with other plants.

Water Garden and surrounds

Based on the shingle pits of the 1920's, the Water Garden has been developed into a cool, peaceful area enclosed by large trees and shrubs. During spring and autumn, the margins of the ponds display flowering plants. The ponds also contain large numbers of water lilies. The pond to the west of the main lake is surrounded by an assortment of exotic plants, a Yucca collection and a *Ceanothus* collection.

Playground area

There are some comparatively rare specimen plantings in the playground area. Of these, the large *Metasequoia glyptostroboides*, *Sequoia sempervirens* and *Tilia petiolaris* are particularly worth noting. Most of the trees are in a healthy and sound condition with attractive natural crown forms, although the area is rather overcrowded.

Stafford Lawn

The Stafford Lawn to the southwest of the Rose Garden contains a range of large deciduous and coniferous trees, some of which are unnamed. Many of the trees have been planted close together and require thinning. The larger conifers

appear to be remnants of a previous conifer collection.

Information Centre Lake



This is an attractive lake surrounded with woodland type plantings. Swamp cypress trees and *gunneras* are notable features.

College Border

The College Border is situated between the Herbaceous Border and the Christ's College boundary wall. It contains a number of trees and mixed shrubs.

Archery Lawn



This lawn contains deciduous broadleaved trees and conifers growing in a reasonably well spaced situation around the perimeter of the lawn.

The Archery Lawn has a row of five magnificent *Sequoiadendron giganteum* trees, which were raised from seed in 1873 and planted along the north side of the lawn. They are all in good condition and are likely to remain in this condition

for a further thirty-five years or more. Two other notable trees grow between the lawn and the main path. These are *Quercus suber* (Cork Oak) and *Q. ilex* (Holm Oak).

Some major branch breakage has occurred to the large *Cedrus atlantica* 'Glauca' in past storms but the tree still remains a reasonably well formed example of the species. The large *Tilia cordata* and the *Tsuga heterophylla* are excellent examples of these species.

The Archery Lawn also contains commemorative plantings by Queen Elizabeth II and other notable people. Most trees on the lawn have a life expectancy in excess of thirty-five years.

Daffodil Woodland



The two hectare Daffodil Woodland extends from south of the Avon River in North Hagley Park to the public hospital grounds and the Murray Aynsley Lawn. The daffodils were initially planted in 1933 and now number in the thousands. After flowering, the leaves are allowed to die down naturally. The daffodils are a major feature of spring in Christchurch.

The main tree species which comprise the original woodland tree plantings are *Quercus robur*, *Quercus cerris*, *Fraxinus excelsior*, *Ulmus x hollandica* and *Acer pseudoplatanus*. There is an excellent specimen of *Quercus robur* growing near the hospital grounds boundary.

Most of the Daffodil Woodland trees have a similar useful life expectancy as those in Harman's Grove. The trees require the same pruning attention as those in Harman's Grove.

A glade surrounding the trees contains specimen group plantings of trees, such as *Betula nigra* and *Acer griseum*, which are visually compatible with this ornamental woodland setting. However, the podocarp trees planted in the same glade would

perhaps have been better situated in an area closer to the New Zealand native section in the Gardens proper where botanical comparisons could more easily be made.

Harman's Grove



The Harman's Grove extends westward from the Bandsmen's Memorial Rotunda. The Grove tends to be windy and cold for much of the year, except on hot days when the shade is welcome. Traffic noise from Riccarton Avenue is very intrusive.

The main species here are *Quercus cerris*, *Quercus robur*, *Fraxinus excelsior*, *Acer pseudoplatanus*, *Betula pendula*, *Prunus yedoensis* and *Carpinus betulus*. There are several very large specimens of *Quercus cerris*.

The flowering feature plantings of *Prunus yedoensis* along the Riccarton Avenue boundary are becoming increasingly suppressed by the larger growing *Carpinus betulinus* planted alternately with the *Prunus yedoensis* and other large trees behind. Pruning the trees encroaching on the *Prunus* will only provide a relatively short term solution to the problem and the decision should be made as to which trees are to be retained.

Northwest Corner

This area contains a miscellaneous assortment of trees and shrubs, including a group of *Pinus pinaster* on a sand hill and a reasonably large *Araucaria bidwillii*. A semi-circle of rhododendrons is made up of mostly *Rhododendron ponticum* vars. The lower lying areas are subject to water logging in winter.

Bedding Displays

Annual bedding displays are a feature of both the Armstrong Lawn, as well as areas adjacent to the Gardens Café / Tea Kiosk. These displays complement the formal Gardens axis from the Museum to the Curator's House Restaurant and the path from the Rolleston Avenue entrance to the Evelyn Couzins Gates and Archery Lawn.

Comment

Habitat areas

There are a number of areas in the Gardens with special characteristics that make them suitable for ecological or habitat related displays. These include the river margins, the ponds, the woodlands, dry north-facing slopes and microclimate sites.

The conservatories

The conservatories display plants and environments which are not typical of outdoor Christchurch. They provide the opportunity for research on current environmental and economic issues for tropical plants. Simulated habitat creation in the glasshouses is one method which could be used more to further people's understanding of tropical regions.

In addition to displaying plants locally rare in cultivation, the Cuningham House could play a much greater role in education.

Cultural Link Gardens

Exploration of the cultural uses of plants has had limited application in Christchurch. Apart from amenity displays the only major development in this area is the herb garden. The most obvious deficiency is the lack of recognition of traditional Maori use of native plants, although this is likely to be emphasised in other city parks in the future. With increasing cultural diversity in New Zealand there may be other opportunities for this type of planting.

Period Gardens (display of old cultivars)

Current exhibits, such as the Heritage Rose collection, have the potential to be transformed into period gardens, featuring appropriate plants

from the horticultural era in which the plants were current.

Conservation Gardens

Use of the Gardens to conserve endangered plants is still very much in its infancy. There may be further opportunity to develop areas to further promote plant conservation.

14. Buildings and structures

General character

The present buildings are generally not well related, consisting as they are of various forms, materials and colours. Varying degrees of integration into the Gardens setting have been achieved with associated planting.

The historic character of the eastern end of the Gardens is influenced by the Arts Centre, Museum, Curators House and various statues.

Descriptions

Potting shed

The potting shed was built in 1991 and, in addition to normal potting facilities, incorporates office space, seed storage facilities and a laboratory.

Cuningham House



Cuningham House was opened in 1923 as a result of a bequest by Mr C.A.C. Cuningham. It is a large, stately structure of architectural importance and is listed with the New Zealand Historic Places

Trust. A spacious staircase leads to a large peripheral gallery where an extensive collection of tropical plants are displayed.

Heating of the Cuningham House usually starts in March and ends in November. Currently, heat comes from hot water via pipes from the boiler house. The heating pipes are situated approximately 300mm above ground level under the display benches. Air in the glasshouse heated from the pipes is kept at a temperature of approximately 18-20°C over the late autumn, winter and spring months.

The House was designed at a time when growing conditions for tropical plants were not fully known and modern environmental controls not available. Consequently, many aspects of its construction are not entirely satisfactory for good plant growth.

For example:

- The volume of air to be heated in the House is enormous. As a result, heating requirements are high.
- Light levels are inadequate for growth on the ground floor benches under the gallery. Therefore, supplementary lighting is required. Plants generally only last four months on the benches.
- The heating pipes are too close to plants on the lower benches, thus reducing growing efficiency.
- Ventilation control is inadequate.

Townend House



The present Townend House was erected between 1955 and 1956 on the site of the former same-named house donated in 1914 through the estate of Annie Townend, a Christchurch resident and former owner of Mona Vale.

Townend House is essentially a conservatory where a regular succession of popular greenhouse plants are grown.

As with the Cuningham House, lack of environmental control causes problems with plant growth; that is:

- Lack of insulation allows greater heat loss in winter.
- The high ceiling creates more area to heat.
- Lack of light causes elongation of plant growth. For example, *Begonias* seem to suffer in this respect.
- Poor ventilation causes problems with disease control and excessive temperature build up in summer (it can reach 45°C on a hot day).

Difficulties are thus experienced in showing plants for long periods. *Gloxinias*, which should be able to be displayed for two to three months, only last one to one and a half months, which is roughly half their potential show life. With modern glasshouse management, it should be possible to keep temperatures to within an optimum range.

Garrick House

Garrick House was constructed in 1957. It offers a considerable insight into the Gardens' diverse cacti collection.

While many of the cacti are displayed in pots along one wall, a feature of the house completed in 1958 is a diorama depicting a desert. This is in need of maintenance. In from this is a selection of large living cacti.

Garrick House is named for Mr M. Garrick, a local resident who donated a large collection of cacti and succulents to the Gardens in the late 1950s.

Gilpin House

Built in the 1960s, Gilpin House is a modest sized conservatory featuring tropical collections.

Foweraker House



Foweraker House was named for Jean Foweraker, a Christchurch alpine plant enthusiast and donor of many collections of alpine plants to the Gardens.

Fern House

The Fern House was constructed in 1955 as a result of bequests from Mary Rothney Orr and James Foster.

Curators House



This Tudor style building, which is a focal point of the Rolleston Avenue entrance to the Gardens, is now being operated as a restaurant and education facility. It is the second dwelling to be constructed on the site and was built in 1920 at a cost of 2,300 pounds. The house was financed from the sale of gravel and sand removed from areas in the south-west part of the Gardens.

Gardens Café



The Gardens Café is in a unique building that is based upon an octagonal shape and very much a part of the Gardens heritage. The original building was built in 1911 and known as the Tea Kiosk. It burnt down and was replaced in 1922.

Bandsmen's Memorial Rotunda



Situated at the eastern end of Harman's Grove, south of the Avon River, in North Hagley Park, this rotunda was thought to be the first memorial to be erected in New Zealand to commemorate the sacrifices of Canterbury bandsmen who lost their lives in the First World War. It was officially opened by MP Sir Heaton Rhodes on the 19th of September 1926. The Rotunda has been, and continues to be, a popular venue for a wide range of musical entertainment, from brass bands, pipe bands to string quartets. It is a particularly pleasant area during springtime, with the flowering of thousands of daffodils around it.

The Rotunda's columns were replaced in 2002 to bring the structure up to New Zealand Building Code earthquake standards. The new columns are exact replicas of the originals. The Rotunda has a Grade II Historic Places Trust listing.

Peacock Fountain



The Peacock Fountain was erected in the Gardens in 1910. Named for the Honourable John Peacock it was sited at the eastern end of the Archery Lawn. The fountain was dismantled in 1949, due to its deterioration and high maintenance costs.

By the 1990s there was renewed interest to re-establish the fountain in the Gardens. In 1996 the restoration of the fountain to its former glory had commenced at a new site at the northern end of the Armstrong Lawn and it was officially re-opened the following year. A rare example of this type of Edwardian design, the fountain was recommissioned by Mayor Vicki Buck in 1996.

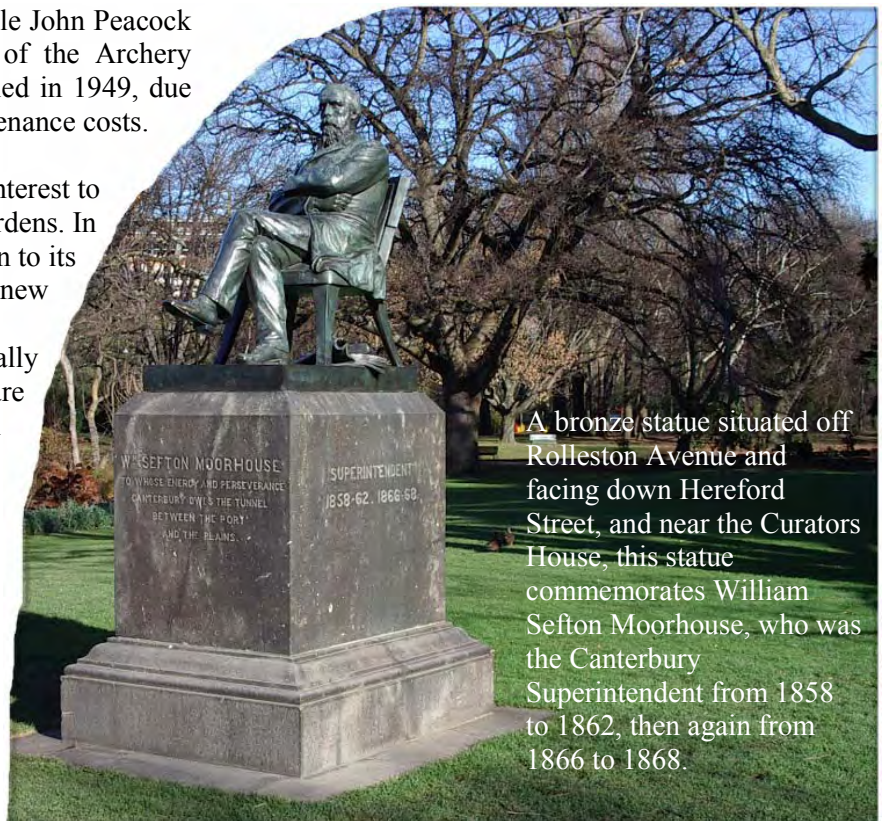
Further restoration of the fountain was undertaken early in 2007.

Fountain Regret



An abstract fountain located at the eastern end of the Archery Lawn. This was sculptured by Sam Mahon and designed to be interactive, with two moving sections being able to be activated by a hand lever at the side of the pool.

Moorhouse Statue



A bronze statue situated off Rolleston Avenue and facing down Hereford Street, and near the Curators House, this statue commemorates William Sefton Moorhouse, who was the Canterbury Superintendent from 1858 to 1862, then again from 1866 to 1868.

Pilgrims Well

A stone memorial enclosing a spring, with a black marble plaque and flanked by two stone seats. Located on the north bank of Avon River in North Hagley Park, across from the northern-most point of the Gardens. When European settlers arrived at Christchurch in 1850, many erected temporary shelters known as V-huts in the adjacent area of Hagley Park known for many years as Settlers Corner. A naturally occurring spring from which the settlers drew water emerges at this point on the river. The memorial commemorates the eightieth anniversary of the settlers' landing.

Te Puna Ora Spring ('The Spring of Life')



A single jet of water coming out of a rock and feeding into a small pond, surrounded by several stone carvings by Mr Riki Manuel and Mr Douglas Woods. Located west of the Central Rose Garden adjacent to the Water Garden.



Eveleyn Couzins Memorial

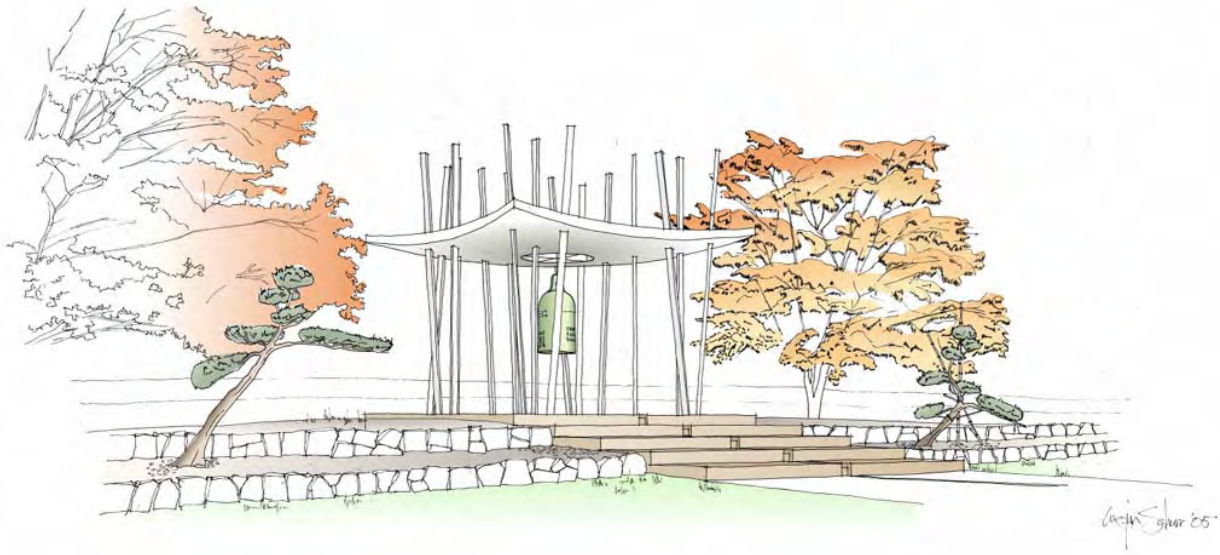
Situated at the eastern entrance to the Archery Lawn, this memorial, comprising semi-circular stone walls and pillars with a central gateway and bronze plaque, commemorates Eveleyn Couzins, Mayoress of Christchurch from 1941 to 1945.

Memorial seats

- 1) In the Herbaceous Border.
- 2) A seat constructed of Halswell Stone at the south-west corner of the Harper Lawn.
- 3) Harman's Grove Stone Seat, near the Woodlands Bridge on the north side of Harman's Grove.

Memorial sundials

- 1) An Oamaru Stone cairn with slate dial and bronze shadow marker in the Herbaceous Border.
- 2) In the centre of the Rose Garden, a tapered stone cairn with black marble table and bronze shadow marker set on an octagonal stepped stone base. Plaque made of bronze, erected in memory of Thomas Stevenson.



H. F. Herbert Memorial Shelter

This shelter, situated near the children’s playground, was built in 1945.

Paddling pool walled seating

The walled seating area near the paddling pools was built in 1972 to commemorate the golden jubilee of the Christchurch Rotary Club.

The Magnetic Observatory Workshop

A small, weather board building in the Botanic Gardens is a remnant of the Christchurch Magnetic Observatory, which was based on this site from 1901 to 1969. The Observatory, the fourth of this nature to operate in the Southern Hemisphere, was visited by many Antarctic expeditions and distinguished people, including Captain Robert F. Scott, Ernest Shackleton and Charles Richter.

This building has a concrete floor that contains a gravity benchmark as part of the New Zealand National Gravity Base Network.



Peace Bell

New Zealand’s World Peace Bell has been gifted to Christchurch by the World Peace Bell Association and was installed in a shelter west of the western end of the Archery Lawn in October 2006 as part of a new city Peace Walk.



The Bell is a replica of the original World Peace Bell gifted to the United Nations in 1954 and is one of only nineteen such bells around the world. It is made of coins and medals from 106 countries, including New Zealand, committed to the promotion of world peace.

Christchurch Meteorological Station

The Climatological Station, sited on the lawn southeast of the Gardens Café, was set up about 1991. Observations are recorded daily.

Hagley Fundamental Bench Mark

The Hagley Fundamental Bench Mark is a survey point to be used as an origin of level datum in the advent of a major earthquake in Christchurch.

There are only two fundamental bench marks in use in Christchurch. One is in the Gardens, set in the Observatory Lawn to the southwest of the Gardens Café; the other is on McCormacks Bay Road at the foot of Mount Pleasant.

It is critical that any development work in the vicinity not affect the bench mark in the Gardens in any way.

Public toilets

There are two public toilets in the Gardens. One is near the children's play area and the other is near the Museum.

Comment

There is scope for more bold sculptured pieces to terminate vistas and pathways and create focal points within large lawn areas. Most botanic gardens overseas make use of natural surroundings to promote statuary and outdoor art works (Given 1989). Any future building in the Gardens needs to be better integrated with existing Gardens buildings.

A number of steps need to be investigated to further improve growing conditions and reduce running costs in the glasshouses. There is also a need to ensure that all public buildings are accessible to the disabled.

15. Public use

The Gardens receives an estimated total of 1.2 million visits per year. This makes the Gardens one of the most popular visitor destinations in Christchurch and certainly the most popular passive recreation area.

Visitor survey

Most of the following statistical information is based on a 1985 survey of Gardens visitors conducted by B.G. Rooke. 161 people were surveyed. Percentages given are the proportion of this sample size that have responded for each category.

See Section 4 (Who uses the Gardens?) starting on Page 4 for a brief overview of the results of more recent (2004) surveys of Gardens' visitors.

Origin of visitors

Christchurch	63.4 %
South Island	9.9 %
North Island	4.3 %
Overseas	22.4 %

23.5 % of the above visitors said they would probably never be able to pay a return visit to the Gardens.

Generally, summer is the most popular time to visit the Gardens, although many people favour no particular time of year. Length of stay generally ranges from half an hour to three hours. Family groups and couples comprise 44 % of gardens visitors. Singles make up 22 % and schools comprise 15 %.

Length of visit

Passing through	6.8 %
Less than half an hour	9.3 %
Half an hour to one hour	34.8 %
Two to three hours	32.9 %
Full morning (usually 10.30am -2.30pm)	10.6 %
Full afternoon	3.1 %
Full day	2.5 %

Significantly, 70% of visitors are female. Of these, a large proportion are mothers visiting the Gardens with young children. Overall, visitors to the Gardens have attained higher education levels than the general population and a proportionally greater number belong to the middle to upper middle socio economic groups.

It is interesting to note that one of the reasons people visit the Gardens is because of an earlier

visit in a school party. It would appear that school visits have an important role in introducing children from many different socio-economic backgrounds to the Gardens.

Prompt to visit the Gardens

Previous visits	37.3 %
Other/miscellaneous	23.6 %
School	14.9 %
Advertising	6.8 %
Friends	6.8 %
Relatives	6.8 %
Community group	3.1 %
Club activity	0.6 %

Activities undertaken in the Gardens

The following table shows the relative order of importance of activities undertaken by the surveyed visitors to the Gardens. Respondents were asked to indicate which activity was important or of little/no importance to them.

	Important	Little/No Importance
For relaxation/rest	83.6 %	11.8 %
Viewing plant displays	78.5 %	21.6 %
Walking	72.7 %	27.9 %
Wildlife	59.7 %	40.2 %
Children's playground	48.1 %	51.9 %
Picnic	47.7 %	52.2 %
Exercise	44.6 %	55.4 %
Horticultural knowledge	42.2 %	57.9 %
Gardens Restaurant	28.9 %	71.0 %
Passing through	19.4 %	80.5 %

The most important activities in the Gardens are for relaxation/use of rest areas and viewing of plant displays.

Approximately half of the surveyed visitors to the Gardens considered the playground to be important. This possibly reflects the large number of family groups and women with young children who visit the Gardens.

The table below indicates the level of popularity, for the surveyed visitors, of features in the Gardens.

Facilities used in the Gardens

Water areas	82.0 %
Rose garden	79.5 %
Glasshouse	73.9 %
Native plant areas	64.6 %
Children's playground	54.7 %
Art gallery	50.3 %
Other	22.4 %

Number of visits each year

A significant number of people (58 %) visit the Gardens four or more times each year. 10.6 % visit the Gardens 21 or more times in a year, while 26 % only visit once. The 26 % is mostly made up of overseas tourists and North Islanders.

The large number of return visits (that is, 74 % make two or more visits) is a good indication of the Gardens popularity.

Approximately 78 % of the Christchurch residents who visit the Gardens travel less than eight kilometres to get there.

From these statistics, it can be surmised that the most important characteristic of the Gardens, from a recreation point of view, is that it provides a quiet, restful and pleasant place, that is based around botanical and horticultural interest. These are features that the Gardens already has. It is, therefore, important that circulation routes, signs and information are made as clear as possible to facilitate optimum visitor use of the Gardens.

Playground

The old playground, situated in an attractive sheltered microclimate, was an important part of the Gardens for 50% of visitors. Up to 5,000 people had been recorded using the playground area on a fine day. The playground was redesigned and rebuilt in 1992. It provides more opportunities for families and provides an incentive for people to visit the Gardens who otherwise might not do so.

Comment

The above survey indicates that for public recreation in the Gardens, relaxation and rest, plant displays and the playground rank highly for visitors, at least those that were surveyed. It is

quite likely that the attractive setting of the Gardens, with its abundant and diverse range of large mature trees and attractive displays, is a key reason why many people visit.

Proposed developments to enhance public recreation in the Gardens are, for example, to:

- Increase educational opportunities for the public.
- Allow for light entertainment in the paved area around the Gardens Café and in the children's playground area, such as during Easter and Christmas, and including activities like drama, music and folk dancing.
- Create more botanical feature areas.

16. Analysis and conclusion

Historical change

The Gardens as seen today has essentially resulted from the efforts of the various curators who applied different design concepts and ideas in their respective development and reorganisations of the place.

Outcomes of this include:

- Little significant updating of the Gardens circulation system, which has remained largely unmodified from the late 1940s to the present day.
- Continued frequent changes to the plant collections, with the resultant mixing of collection types. Overall, planting and tree growth has infilled most areas of the Gardens to create a predominantly woodland aspect, thus reducing areas where higher light requiring plants can grow well.

Design

The Gardens have never been designed as a single entity. This has led to numerous issues with the Gardens spatial and circulation network.

Future development should include consideration of how the existing spatial structure might be

integrated and extended. It should also include substantial improved user orientation in the areas of the Gardens that do not have clearly identifiable landscape features to aid this. This may require strategic location of new structures or features, careful disposition of new plantings, adjustment to the network of paths, or some combination of these. Adjustment to the path system will be the easiest of these to achieve in the short term and is, in any case, required due to its current deficiencies.

The Gardens also lack a high viewing point to permit the visitor to gain an overall impression and pick out the strategic features. Guide maps do not entirely address this, since many people have difficulty in interpreting maps. Identifiable landmarks are therefore essential and need to form a network that covers the whole site.

Plant collections

The Gardens contains one of the most important collections of exotic and indigenous plants in New Zealand. This is facilitated by a climate that is conducive to the growing of a wide range of plants from many areas of the world. Trees form the dominant component in the character of the Gardens. Many of the mature specimens are now over 110 years old. Unfortunately, years of ceremonial and general planting at various times in the Gardens history has led to considerable duplication of different tree species. Many potentially large growing trees are planted close together.

Plant collections have been changed a number of times in the history of the Gardens, with the end result that significant numbers of plants in collections have no botanical relationship with each other or with current collection aims. There is an urgent need to clearly designate the purpose for which each planted area of the Gardens is kept. The Gardens requires a clear planning framework in order that change may be managed in a staged and coherent fashion. This will ensure future plant collection integrity and protection from unplanned incremental change.

Importance to Christchurch

The Gardens is one of Christchurch's foremost attractions and, consequently, of significant

economic importance to the city. The upgrading of adjoining city facilities, such as the Worcester Street Boulevard and the Arts Centre, has made it necessary that the Gardens is developed and maintained to an equivalent standard. Its standing as one of Christchurch's primary visitor attractions depends upon it.

Importance to New Zealand

In spite of some past deficiencies, the Gardens is a significant garden in the Australasian region and a crucial New Zealand botanic garden in terms of the range of its exotic plant collections. Overseas botanic gardens have, however, developed a significant range of new functions and roles over the last forty five years in a search for modern relevance, which has not been undertaken to the same degree in Christchurch, except in recent years. There is a need to assess the merit of these new developments in the Christchurch and New Zealand context.

Future directions

In the past, the approach for the Gardens has tended to avoid a strong botanical and indigenous emphasis, and make amenity and exotic horticultural plants the main features of its displays. The institutional side of the Gardens has not developed as strong a scientific function as some overseas gardens, although, in more recent years, this area has received more attention. There is a need to make use of outside botanical expertise, wherever possible, to bolster existing in-house skills. Strict record keeping, modern technology and information sharing with other botanical gardens are essential to enable the Gardens to keep up to date with new ideas and methods in areas such as plant conservation. The future appears to lie in taking the best elements of the Gardens (that is, its amenity appeal and variety of plant collections) and incorporating new elements that reflect world wide environmental concern, increased emphasis on New Zealand's natural/cultural heritage and cultural links with other areas of the world.

The existing resources (that is, the plants, structures and staff) that make up the Gardens have been, and are, subject to many influences and changes. There are three major, interrelated issues facing the Gardens today:

1. How to best develop the Gardens to further promote the world of plants (with due regard to the botanical imperatives of the late 20th and early 21st Century).
2. How to enhance, and meet, Christchurch resident's expectations and use of the Gardens.
3. How to appropriately enhance the Gardens value as one of Christchurch's primary attractions that is of major economic importance to Christchurch.

Part IV of this management plan serves to indicate how these issues, and others, can be addressed through the implementation of a set of actions.



PART III
MANAGEMENT GOALS, OBJECTIVES AND
POLICIES



Primary Goal: To promote understanding and appreciation of the world's flora, and its botanical and horticultural attributes and uses, including of Southern Hemisphere plants.

Comment: The Gardens is the most significant site in the city for the representation of a diversity of plant species and their uses. It is an important attraction in respect of its amenity and horticultural values. Yet, significant improvements could be made to the Gardens layout and the way in which its plants are organised.

In conjunction with improving the botanical quality of its plant collections, there needs to be a strengthening of the amenity values of the plant collections in key areas in order to maintain the Gardens attractiveness and for it to continue to be a leading Christchurch visitor attraction .

Although the Gardens employs a somewhat different approach to that of many of the traditional and modern botanic gardens of Europe and America, it has the potential to relate modern botanic garden values to the interests and values of Christchurch citizens in addition to allowing a better understanding of different aspects of the plant world.

It is important that the unique character of the Gardens is continued to be developed through, on the one hand, the reflection of Christchurch's garden and botanical heritage and, on the other hand, acknowledgement of its position in the Southern Hemisphere.

Parts of the Gardens will continue to be dedicated to the representation of New Zealand's plant species and, where possible, these areas are to be expanded and improved, including the development of indigenous plant collections in satellite gardens throughout the city.

- Secondary Goals:**
1. To assist visitors in their experience and understanding of the beauty, variety and complexity of the plant world.
 2. To promote the experience and understanding of New Zealand and, in particular, Canterbury flora.
 3. To conserve and promote conservation of rare and endangered plants.
 4. To promote the environmental importance of plants.
 5. To promote a greater understanding of the way plants relate to their environment (that is, plant ecology) and of the origins of ornamental plants through educational displays and interpretations programmes.
 6. To exchange information, plants and other material with botanical institutions worldwide.
 7. To introduce and display new and uncommon plant species and cultivars suitable for cultivation in Canterbury.
 7. To display and promote understanding of different ethnic uses of plants.
 8. To contribute to a greater understanding and use of plants through scientific research.
 9. To provide an open space within the City for relaxation and enjoyment.
 10. To promote and display plants for their horticultural importance and uses, including their use in residential and other amenity gardens.
-

To meet the above goals this plan aims to guide and encourage ongoing development and enhancement of the Gardens through implementation of a number of objectives and policies that is expected to achieve excellence on five major fronts:

- A. Amenity/Horticulture:** This involves enhancement of the main visitor circulation corridors and a number of key developments.
- B. Layout/Circulation:** The intention is to improve the Gardens' layout and circulation to make the botanical features of the Gardens more accessible to visitors and ensure that views of significant features are maintained.
- C. Botanics:** The Gardens' botanical qualities will be enhanced with policies that outline the exact purpose for which plant collections are held. There are several main botanical improvements proposed. These include:
- (i) an increase in Southern Hemisphere plants (Canterbury Section, New Zealand Alpine extension, Southern Hemisphere-Gondwana display);
 - (ii) geographic area habitat plantings (wildflowers)¹¹;
 - (iii) ethno-botanical/cultural developments (Asian ethno botanical development and uses of New Zealand plants by Maori)⁹;
 - (iv) initiation of a Sustainable and Healthy Tree Plan¹². Approximately forty percent of tree planting in the Gardens will be organised geographically.
- D. Education:** Education is a primary function of the botanic gardens. In addition to the valuable educational work already done by Gardens staff, this plan aims to make the Gardens a reference centre for local botanical information.
- To make this a reality it is proposed that the Gardens' Southern Hemisphere/Canterbury plants emphasis be given a local application through information links to the city's natural areas.
- E. Facilities:** The current facilities for visitors, staff and Garden operations are inadequate. Options for upgraded or new facilities will be investigated and, following elected Council decisions, implemented over the next two to five years leading up to the 150th anniversary in 2013 of the formation of the Gardens.

¹¹ There is no specific policy or proposed garden to display ethno botanical or regional plantings in the Gardens, but in the development of certain new, or re-development of existing, collections or trails, there is the opportunity to include plants from Asia, New Zealand plants used by Maori, and plants, such as wildflowers, from different geographic areas around the world.

¹² The Sustainable and Healthy Tree Plan will achieve sustainable and healthy management of the trees in the Gardens (and Hagley Park) for up to twenty years into the future, and advise on annual costs and rates of tree replacement and the species to be used.

17. Administration

Objective: 1 To administer and manage the Gardens according to the legal instruments under which it is held.

Policy: 1.1 The Gardens shall be administered and managed according to the provisions of the Reserves Act 1977.

Comment: In particular, for the legal area of the Botanic Gardens, which lies within the loop of the Avon River, Section 23 of the Act applies. This section specifies requirements for Local Purpose Reserves (Botanic Gardens).

In addition, areas of Hagley Park are treated for Botanic Gardens purposes. These are the areas of North Hagley Park between Riccarton Avenue and the Avon River, but are part of a Recreation Reserve under the Reserves Act. The development, management and use of these areas are subject to the provisions of Section 17 of the Reserves Act, and all other sections of the Reserve Act relevant to this classification, and the relevant sections of the Christchurch City Reserves Empowering Act 1971. This latter Act ensures that no part of the Park is unduly appropriated for further vehicle parking space or set aside for any public work under the Public Works Act. Guidance is also given by policy of the Hagley Park Management Plan.

Objective: 2 To ensure specialist horticultural, scientific and educational expertise in the management, display and interpretation of the Gardens plant collections.

Policies: 2.1 Specialist horticultural staff shall be employed to develop and maintain the plant collections to the highest possible standard.

2.2 Horticultural apprentices and trainees shall continue to be given training and experience in maintaining specialist plant collections.

2.3 Adequate information systems shall be maintained to assist the best management of existing and new plant collections.

2.4 There shall be ongoing informal liaison, where appropriate and feasible, with groups that have a stake, or interest, in the Gardens, including the Friends of the Botanic Gardens, to assist Gardens staff, and the Council generally, with implementation of the management plan and promotion of the Gardens.

2.5 External botanical expertise and advice shall be sought whenever appropriate, especially when new displays are established and existing displays are upgraded.

Objective: 3 To ensure adequate maintenance and development funding in line with the Gardens status as one of Christchurch's foremost civic attractions.

Policy: 3.1 Funding shall be sought from a variety of sources including direct funding by the Christchurch City Council, sponsorship, bequests and through a trust fund proposed to be established to ensure that the Gardens continues to attract local and international visitors.

Comment: A previous tourism study found that improving attractions was essential to increasing visitor patronage. The Gardens are an important Christchurch tourist attraction and need to be funded appropriately.

18. Functions and operations

Plant acquisition, propagation and dissemination

Objective: 4 To propagate and exchange plants for display or research purposes.

Policy: 4.1 Plans for inclusion in plant collections shall be obtained from a certified source and, where propagated from seed, preferably collected in the wild from a recorded habitat.

Objective: 5 To exchange plants or seed with botanic gardens, botanical institutions and plant specialists internationally.

Policies: 5.1 The Gardens shall seek to exchange certified seed with other botanic gardens, arboretums, universities and private collections.

5.2 Excess plants from the seed exchange shall be exchanged or sold.

5.3 Seeds listed in the Gardens Index Seminum shall consist of New Zealand native plants and shall be checked for correct identification before listing and dispatch.

5.4 Seed from exotic, rare and endangered species shall be collected upon requested.

Comment: Great care is required to ensure that seed exported from and imported into the Gardens is true to type. Incorrect naming of plants and sending out of wrongly identified seed is difficult and often time consuming to remedy.

Plant records

- Objective:** 6 **To identify and record the location and significant details of all plants in the Gardens.**
- Policies:**
- 6.1 An electronic filing system shall be maintained to record plant location and significant details.
- 6.2 The existing filing system shall be updated with regard to:
- correct nomenclature;
 - documentation of all living collections, including those of wild origin;
 - identification of unknown plants.
- 6.3 Computerised plant records shall be copied into a fully relational database that will enable sorting according to, for example, families, origin and cultural requirements.
- 6.4 A systematic check of the gardens shall be carried out on a regular basis to check for flowering, fruiting, health and survival of all plants and their labelling needs. All findings will be recorded.

Herbarium

- Objective:** 7 **To maintain and expand on the herbarium collection to support plant identification, research and teaching.**
- Policies:**
- 7.1 The herbarium collection shall be representative of the:
- (a) Gardens' living plant collections.
 - (b) Canterbury's flora and New Zealand cultivars.
- 7.2 Preparation and storage facilities shall be provided for the enlarged herbarium based on accepted herbarium standards.
- Comment: A "working" herbarium is an essential tool in the running of a botanic garden.*
- 7.3 Access to the herbarium shall generally be allowed for approved persons for study and identification purposes.
- 7.4 The historic Armstrong herbarium shall continue to be protectively housed at Landcare Research, Lincoln, until new storage facilities are available in the Gardens.

Science and research

A basic requirement of a botanic garden is that its scientific role is carried out in a professional manner. This is especially important in Christchurch in view of the general lack of scientific contribution to the Gardens' development over the years.

Objective: 8 To assist with research institutions and organisations in botanical research projects and to make greater use of the Gardens' plant resource for research purposes.

- Policies:
- 8.1 The Gardens shall be a member of the Botanic Gardens Conservation International (BGCI).
 - 8.2 The Gardens shall actively participate in the Botanic Gardens of Australia and New Zealand (BGANZ) forum.
 - 8.3 Conservation related projects conducted at the Gardens shall be coordinated with similar projects in operation in other New Zealand institutions.
 - 8.4 The setting up of a horticultural research programme incorporating propagation and cultivation studies, hybridisation studies and work on special purpose plants will be investigated in consultation with other relevant organisations such as Landcare Research New Zealand, Lincoln University and Canterbury University.
 - 8.5 The Gardens shall investigate the setting up of a tissue culture propagation unit for the proposed new potting shed to complement the above research functions.

Comment: Horticultural research should aim to promote New Zealand and especially Canterbury flora of horticultural significance, and exotic plants of special significance that may have economic potential. Assistance may be required from institutions such as Landcare NZ, University of Canterbury and Lincoln University in the setting up and management of Gardens' research projects.

Objective: 9 To seek assistance and co-operation from scientific institutions and organisations in administering the Gardens scientific functions.

Education and public use

Objective: 10 To assist the public in their experience and understanding of the plant world.

- Policies:
- 10.1 All plant collection shall have an interpretation programme with an accompanying information pamphlet.
 - 10.2 All plants, or groups of plants and collection themes, as appropriate, shall be labelled with labels legible from the nearest path. If this is not possible, then some other means of identifying plants shall be used.

Comment: Generally plant labels will list the plant family, genus and species, geographical origin, common name and accession number.

- 10.3 Education opportunities shall be provided in the following areas as appropriate:
- An invitation lecture series (including overseas speakers).
 - Community education programmes (lectures/demonstrations).
 - School education programmes.
 - Teaching aids for schools (Gardens education kit).
 - Slide/video presentations.
 - Guided tours.
 - Night block courses.
 - Weekly/monthly newspaper articles.
 - Botanical field trips.
 - Gardens exhibitions.

10.4 Features and activities occurring in the Gardens shall be promoted via the media and other suitable means.

10.5 The training and education of persons seeking a career in horticulture shall be contributed to.

10.6 The Visitor/Information Centre shall function as the main site for lectures, displays and interpretation.

Objective: 11 To encourage greater local and international use and experience of the Gardens aesthetic, educational, scientific, and cultural qualities.

Policies: 11.1 New ways of advertising the Gardens internationally and nationally as a tourist attraction shall be investigated, including active participation in the Cultural Precinct.

Comment: The Gardens is important as a means of attracting overseas and local visitors to Christchurch. Greater numbers of overseas garden clubs and specialist horticultural clubs can be encouraged to visit the Gardens, especially as they often visit at off peak times during the week.

11.2 The playground shall be maintained as an attraction to draw more people in to experience other Gardens qualities.

Comment: The siting of the playground in the Gardens is to encourage families in.

11.3 The existing children's playground in the Gardens shall be enhanced.

Comment: The Hagley Park/Botanic Gardens Hearings Subcommittee, during its consideration of the public submissions, recommended playground enhancement, and this was adopted by Council on 16 August 2007.

11.4 There shall be no extension of the playground beyond the existing planted perimeter.

11.5 Seating will be reasonably provided through the Gardens.

- 11.6 Visitor numbers and use of the gardens shall be regularly monitored.

Comment: Accurate, up-to-date information on visitor numbers and uses of the Gardens is crucial for planning of development and maintenance programmes.

- 11.7 A plant interpretation programme that relates Gardens displays with areas in the City and throughout Canterbury shall be instigated.

Comment: A major opportunity exists for the Gardens being able to act as an information referral point for other botanical areas in the City. For example, over 200 sites within the City's boundaries display representative examples of pre-European nature. A large number of these sites are situated in parks.. It would be possible to link relevant areas of the Gardens (for example, New Zealand bush, native riparian areas and Canterbury displays) by way of labels, displays, talks and brochures with the real natural example elsewhere in the City or in the wider Canterbury area. For example, the kahikatea plantings in the Gardens could be used to draw attention to the prehistoric Riccarton Bush only a short travelling distance away, and plants of the subalpine garden can be seen at Arthur's Pass. This approach would increase the Gardens value to visitors and enhance the city and region as a whole through ecotourism and Gardens related tours.

Revenue generation

Objective: 12 To generate revenue to support the maintenance and development of the Gardens.

- Policies:
- 12.1 The Gardens Café and the Curator's House Restaurant shall continue to operate under leasehold concessions.
- 12.2 A marketing strategy for obtaining appropriate sponsorship and the raising of funds for Gardens developments shall be prepared.
- 12.3 Promotional material shall be produced for wide distribution.

Criteria for evaluating commercial activities

Any proposed commercial activity shall:

- 12.4 Be compatible with the goals and objectives for the Gardens.
- 12.5 Not physically diminish the aesthetic values of the Gardens.
- 12.6 Not impact on the ability of staff to maintain and develop the Gardens plant collection and displays.
- 12.7 Show that a rate of return that is acceptable to the Council is able to be achieved.

19. Circulation

The Gardens circulation system is crucial for optimum visitor use, yet has never been specifically designed. The path system lacks overall co-ordination and is largely comprised of a patchwork of uncoordinated routes laid out at different times for different purposes. Widths, alignments and surfacing of paths tend to reflect perceived maintenance requirements rather than visitor needs. In addition, there are issues with entrances to the Gardens with respect to location, width and, in one case, pedestrian safety.

Objective: 13 To develop a circulation network that meets both visitor needs and management requirement.

Policies: 13.1 A new circulation network shall be progressively developed for the Gardens, which builds on the best aspects of the existing system and enhances its pedestrian use qualities.

- 13.2 A system of five clearly delineated major walkways shall be developed to provide visitors with an experience of different aspects of the Gardens character:
- Victoria Walk (amenity and horticultural features).
 - Banks Walk (open space and specimen trees).
 - Avon Walk (river views and habitat areas).
 - Cockayne Walk (New Zealand / Canterbury plant species and natural hybrids)
 - Woodland Walk (woodlands and habitat areas, including naturalistic mass floral displays).

13.3 Path widths shall be set according to the path's intended use and status in the circulation hierarchy.

13.4 A series of landmark features shall be established at important path junctions or at the ends of major paths to act as focal points and to help orientate the path user. (See Policy 13.5 for approval criteria).

Comment: Landmark features can include information facilities, seats, trees and artwork.

Criteria for monuments and statues

- 13.5 Consent to erect plaques, monuments, statues and art works shall only be granted when the following criteria are met:
- Plaques shall be unobtrusive and restricted to commemoration of ceremonial plantings.
 - Memorials shall have specific historical relevance to the Gardens or to botany or horticulture.
 - Art works shall have relevance to the Gardens or to botany or horticulture generally.
 - The siting shall be such so as to enhance the immediate environment and not obstruct Gardens functions.
 - The design, character and form shall be of a high standard and add to the Gardens amenity value.

20. Layout and character

Trees

The Gardens contain a magnificent collection of mature trees. They are one of its major public attractions. There has been, though, considerable duplication of species. This has reduced the range of individual specimens that can be grown. The following policies aim to rectify this situation by introducing a comprehensive planned approach to future tree planting.

Objective: 14 To display representative tree species from the temperate world for the purpose of:

- (a) Education about the plant world;
- (b) Horticultural information;
- (c) Amenity and visual appeal;
- (d) Research and scientific advancement.

Policies: 14.1 Trees planted in the areas designated as geographic areas on the Existing Site Features map (Figure 8.1, Page 10) shall be native to the global geographic region that these areas represent:

Comment: The regions represented are North America, Asia, Europe and the Southern Hemisphere.

14.2 All trees shall be identified and their general condition and probable life expectancy noted.

14.3 A Sustainable and Healthy Tree Plan shall be prepared for the entire Gardens listing potential replacement species and planting sites.

Comment: Council, with its adoption of the Hagley Park/Botanic Gardens Master Plan on 16 August 2007, included in that operative plan Project 9 (Sustainable and Healthy Tree Plan) to ensure the maintenance of sustainable and healthy trees for up to twenty years for Hagley Park and the Gardens, which links with city-wide tree policies and tree renewable programmes that are underway or being developed.

14.4 Species or cultivars already present in the Gardens shall not be duplicated, except where required for specific plant.

14.5 Immature duplicate specimens (where there are several examples) that can be shifted will be removed from the Gardens.

Objective: 15 To ensure that all commemorative planting in the Gardens is planned and conforms to Gardens objectives and policies.

Policies: 15.1 All commemorative planting shall be in accordance with the goals, objectives and policies outlined for specific vegetation areas and in the Sustainable and Healthy Tree Plan.

15.2 Commemorative planting in the Gardens shall be restricted to that undertaken by Heads of State.

Objective: 16 To ensure that all trees are in safe condition, well maintained and are not causing damage to significant structures or services or inhibiting the growth of more desirable specimens.

Policies: 16.1 Trees shall be grown and maintained to represent as near as possible their normal character and form, unless they need to be grown in a highly stressed situation or manicured for specific scientific, amenity or educational reasons or retained for conservation objectives.

16.2 Trees may be removed from the Gardens in the following situations in conformity with the goals, objectives and policies of this plan. The Gardens management has delegated authority for the removal of trees. (Note: The Council will publicise decisions to remove exceptional specimens before doing so. When rare or unusual plan material is to be removed it will be propagated and new specimens grown on prior to removal).

Situations where trees may be removed, subject to this plan's goals, objectives and policies:

- The tree is dead, dying or diseased.
- The tree is a danger to public safety.
- The tree is suppressing or inhibiting growth of more desirable specimen trees or other vegetation of greater interest to the public.
- The tree is a poor specimen or unsuited to the site and needs to be removed in order that the area is replanted with trees that will make better specimens.
- The species is unnecessarily duplicated elsewhere in the Gardens.
- The tree interferes with essential public utilities.
- The tree is obstructing the water flow in any drainage system, watercourse, stream or river.
- The tree has outgrown its location or site and is causing serious damage to buildings or property, public or privately owned.

Open space areas

Open space¹³ areas are those where it is desirable to retain open lawn or low level planting. Isolated specimen trees may be planted in these areas but should be kept to a minimum and sited so as not to obstruct visibility. Parts of the Gardens have now reached the stage where it is no longer possible to clearly view individual trees.

Objective: 17 To conserve open space in the Gardens in order to aid visitor orientation, allow clear views of significant trees, the Avon River and other garden features, and to allow sunlight to reach the ground floor.

Lawns

The Gardens feature a number of named lawns and open grassed areas. These allow views of Gardens features and specimen trees and enable visitors to orientate themselves in relating to their surroundings. The orderly sequence of these spaces in an overall pattern is essential for an interesting and logical circulation network in the Gardens. However, over the years these areas have gradually been filled with new trees to the extent that some areas can no longer be truly described as open space.

¹³ Open space is taken in this context to be those areas in the Gardens that are largely free of tall, dense vegetation, thereby permitting views across the areas in question to adjoining areas.

See the Existing Site Features map (Figure 8.1, Page 10) for the location of lawns in the Gardens.

Armstrong Lawn

Objective: 18 To maintain and enhance the Rolleston Avenue entrances to the Gardens, and views in and out, as an open lawn planted with specimen trees.

Notes:

1. As trees now fill most of the Armstrong Lawn open space, it is necessary that further tree planting there is controlled.
2. The native planting is intended to complement the existing native plants alongside the Museum and give overseas visitors a taste of New Zealand.
3. The part of the Armstrong Lawn alongside the Rolleston Avenue boundary may be the only part of the Gardens that some tourists visit on their way to the Museum.
4. It is important that views of the side of the Museum and access to it for maintenance and entrance into the building are retained.

- Policies:**
- 18.1 The heritage features of the Armstrong Lawn shall be retained; in particular:
- The view from the museum to the Curators House.
 - The vista from the Archery Lawn to the Arts Centre through the Evelyn Cousins gateway.
 - Existing carpet bedding schemes.
 - Large specimen trees.
- 18.2 Required replacement planting for inside the Rolleston Avenue frontage shall comprise predominantly large growth deciduous trees and an open under-story in order to retain views of the Arts Centre from the Gardens.
- 18.3 An open space corridor shall be maintained between the Armstrong Lawn and the Daffodil Woodland across the Avon River in Hagley Park to allow views of the river.

Archery Lawn

Objective: 19 To maintain an avenue effect on both sides of the open Archery Lawn with attractive large trees and a clear view through the centre of the Lawn.

Policy: 19.1 The integrity of the row of *Sequoiadendron* trees shall be maintained.

Potts Lawn

Objective: 20 To display lawn specimens of hardy palms suitable for a temperate climate.

Other Lawns

Objective: 21 All Gardens lawns shall be conserved as open space for aesthetic and user orientation reasons.

Lawns, in addition to the Armstrong and Archery Lawns, are:

- Central Lawn
- Playground Lawn
- Western Lawn
- Harper Lawn
- Murray Aynsley Lawn
- Stafford Lawn
- Observatory Lawn
- Hall Lawn
- Pinetum Lawn

Lakes

The lakes include some of the most picturesque areas of open space in the Gardens. Most are enclosed by surrounding belts of thick vegetation. In many cases this contributes to their charm and environmental quality – for example, the Water Garden on the western side of the Gardens and, to a lesser degree, the adjacent Western Pond. However, the unique contribution that water bodies can make to improving the character of associated open spaces is diminished in other parts of the Gardens because of an over abundance of screening vegetation, such as by the Information Centre Lake.

The lakes and their margins also offer a unique opportunity for the creation of specialised habitats for the growing of aquatic and marsh plants. Enclosed lake areas can also allow creation of areas with greater potential humidity. Generally, the botanical potential of the Gardens lake areas can be further enhanced with more plantings of species that prefer these habitats.

New Zealand Section Lake

Objective 22 To preserve the open character of the New Zealand Section Lake and the views of it as an amenity feature and to enhance views of the surrounding native vegetation.

- Policies:
- 22.1 A collection of native swamp vegetation shall be maintained on the lake.
 - 22.2 The grassed area on the eastern side of the lake shall be kept clear of shrubs to maintain a clear view of the lake and the surrounding vegetation and to retain the attractive grass bank / lake interface.
 - 22.3 Exotic plants on the margins of, and in, the lake shall be removed where practicable.

Water Garden – Main Pond

Objective: 23 To display aquatic and marsh plants to maintain the enclosure of existing vegetation on the pond's surrounds.

- Policies:
- 23.1 A greater variety of water lily cultivars shall be introduced to the pond.
 - 23.2 Surrounding plantings shall an emphasis on distinctive bark.

Western Pond

Objective: 24 To display a collection of North American tree, shrub and herbaceous species.

Policy 24.1 The existing *hardy monocot* collections shall be retained and expanded.

Information Centre Lake

Objective: 25 To display North American species to create a woodland setting.

Policy 25.1 The plantings will tie in closely with the objectives for the Western Pond.

Avon River Corridor

The Avon River corridor is an area of continuous open space that encloses the Gardens. It is generally high visual landscape quality is unfortunately hidden, in many places, from the Gardens by high banks and extensive screens of riverside vegetation.

As with the lakes and their margins the river corridor offers a unique opportunity for the creation of specialised habitats for the growing of waterside plants. The dry sunny banks and damper shaded banks offer specific habitat opportunities. In particular, there is great potential for the establishment of riparian native plant communities as many of these types of plants are already colonising the river banks and margins naturally.

Surveys of the city's natural areas and remnant native plants have indicated a surprisingly wide variety of native wetland species still present in the city. However, some of the areas where these plants occur are unprotected and vulnerable to modification or destruction. The Gardens' Avon River and tributary stream (Addington Brook and Riccarton Stream) margins are ideal locations for the conservation of some of these species.

Erosion of the river banks due to the natural dynamics of the river flow is a significant problem in the Gardens. In this artificial situation there is no room for the river to be able to freely alter its course; therefore, bank stabilisation is necessary.

Objective: 26 To enhance the landscape character of the Avon River corridor and provide open space links between the river, where it adjoins the Gardens, and the Gardens.

Policy: 26.1 The visual landscape character of the Avon River corridor that is maintained shall vary along its length where it adjoins the Gardens. Some regrading of the river banks shall be undertaken in places and, eventually, thinning or planting of vegetation in strategic areas.

Objective: 27 To protect the native plant communities established along sections of the Avon River corridor.

Policy: 27.1 All native waterside plants on the lower banks of the Avon River shall be protected where they do not seriously impede the natural flow of the river.

Comment: Ferns and various sedges readily colonise the river banks just above the water line. These plants are descendants of vegetation types that were once common in Christchurch but are now uncommon.

Objective: 28 To further develop the spring flowering nature of the Hagley Park side of the Avon river loop, with continued plantings of *Prunus yeodoensis*, and *Magnolia*.

Comment: The possible relocation of the existing South Hagley Park deciduous Azalea's to a more suitable site within this area.

Objective: 29 To protect the Avon River banks from erosion with aesthetically appropriate natural methods.

Policies: 29.1 Local native riparian plants and non-invasive exotic plants shall be used for future bank retention works.

29.2 Exotic plants, or non native plants not of local provenance, that are likely to colonise the down stream river environment shall not be planted in the river corridor.

Canterbury native river margin and dry land plants

Objective: 30 To display representative examples of Canterbury native river margin plants on the Hagley Park side of the south west bend of the Avon River, and Canterbury dryland plants on the drier slope above the river bank.

Comment: The Hagley Park side of the south west bend of the Avon River is exactly opposite the New Zealand Section in the Gardens proper and has been naturally colonised by native sedge species. Kowhais have also been planted on the southern river bank. It is considered appropriate to extend the New Zealand planting to the Riccarton Avenue side of the river. However, as this is one of the few places from where views of the interior of the Gardens can be gained from Riccarton Avenue it is important that planting does not block key sightlines.

Policy: 30.1 A display of native Canterbury Plains' vegetation shall be established and maintained on a suitable river bank site between the Avon River and Riccarton Avenue.

Comment: This collection could display plants of the Canterbury grasslands, the Rakaia Island shrub forest or the original riverbank shrubland of Hagley Park.

Gondwana Garden

Objective: 31 To display families and genera which have a typically Gondwanan pattern of geographic distribution.

Policy: 31.1 The southern podocarps and beeches shall be displayed.

South American Collection

Objective: 32 To display South American plant species of Argentina and Chile.

Policy: 32.1 The extension of the sand mound to enhance the site and create different planting conditions shall be explored.

Australian Collection

Objective: 33 To display Australian plant species with an emphasis on Victorian and New South Wales highland, and Tasmanian plants.

Comment: It is proposed that this collection should be placed on the Playground Lawn, west of the playground. The Playground Lawn was destined to hold The North American Arboretum, but there is insufficient space for this collection. This collection could not commence until some trees have finished their lifespan.

Southern Hemisphere Contribution to Horticulture

Objective: 34 To display a representative collection of species and cultivars derived from the southern hemisphere.

Policies: 34.1 Criteria for plant choice in a representative collection of species and cultivars derived from the southern hemisphere shall include amenity value and southern oddities in form and function.

34.2 Native plants shall be planted in the Avon River corridor and in wetter marshy areas adjoining the river.

Rock Garden Area

The Rock Garden utilises a south facing terrace in the south east corner of the Gardens. A range of growing conditions have been created in this Rock Garden, ranging from cool shady moist sites to open fast draining screes. These areas of different growing conditions have been created to suit the specialised environmental needs of the alpine, subalpine and woodland plants that are grown. The Rock Garden also contains a number of dwarf herbaceous perennials and shrubs. It is currently divided into two separate parts. The larger eastern part contains a mixed collection of plants from many world regions, generally planted according to habitat requirements. The western part is restricted to New Zealand plants of mostly subalpine or lowland origin. Heavy shade in this area has made the cultivation of alpine plants more difficult.

Exotic Rock Garden

Objective: 35 To grow a wide range of alpine garden plants from mountain regions around the world, including species, cultivars and hybrids, and to display physical geographic associations of these.

Policies: 35.1 The Rock Garden shall continue to feature as wide a range of exotic alpine plants as practicable.

35.2 Conservation planting of exotic alpine plants shall be undertaken, as required.

35.3 No further trees shall be planted where they will shade the rock gardens.

Comment: The Rock Garden has a good selection of plants from the Northern Hemisphere.

Erica and Calluna Border

Objective: 36 To grow temperate Erica species and cultivars and range of Calluna varieties with emphasis on cultivars of horticultural merit.

New Zealand Subalpine Garden

Objective: 37 To grow a wide range of New Zealand subalpine and montane plants, including those that are rare and endangered, with an emphasis on plants of the Canterbury Region.

Policies: 37.1 The existing garden area to the south of the New Zealand Section Lake shall be maintained for the growing of New Zealand subalpine and montane plants.

37.2 The New Zealand alpine garden shall have an emphasis on plants from the Canterbury region with planting to illustrate the transition from the montane zone through to the subalpine zone.

37.3 A New Zealand limestone garden shall be developed in the New Zealand section of the rock garden area.

Comment: New Zealand limestone plants contain a number of rare and attractive species, many of which are at threat in the wild.

Cockayne Memorial Garden

Objective 38 To display a range of New Zealand small trees and shrubs to commemorate the contribution of Dr Leonard Cockayne to New Zealand botany.

Policy: 38.1 The Cockayne Memorial Garden shall display species and natural varieties of genera such as *Hebe*, *Leptospermum*, *Sophora* and *Carmichaelia*, with special emphasis on Canterbury species.

Amenity / Cultural Areas

Curator's House Restaurant Garden

Objective: 39 To develop the garden to demonstrate vegetables, fruit trees, berry fruits and amenity plants that can be used in a small home garden.

Policies: 39.1 Fruit trees and berry fruits with dwarf root stock shall be used.

39.2 Crop rotation as well as companion planting shall be demonstrated.

39.3 A variety of composting systems shall be displayed.

39.4 Both new and heritage cultivars suitable to Canterbury shall be displayed.

39.5 The Curator's House Restaurant Garden plantings shall be linked to heritage plant collections.

Herbaceous Border

Objective: 40 To display a range of herbaceous plants in a formal border situation. To conserve significant rare or endangered cultivars and hybrids from extinction.

Modern Cultivar Rose Garden

Objective: 41 To display a variety of modern rose cultivars in the inner Rose Garden, and a representation of the *Rosaceae* family in a border outside the yew hedge.

- Policies:**
- 41.1 The Rose Garden shall be maintained to a high visual standard.
 - 41.2 The character of the existing historic circular garden design shall be maintained.
 - 41.3 Climbing roses shall continue to be provided for within the inner rose garden.
 - 41.4 'High Health' cultivars with high levels of disease tolerance shall be trialled and added to the Rose Garden.
 - 41.5 Research and development of an Integrated Pest Management (IPM) programme shall be carried out in the Rose Garden.
 - 41.6 Due to shading, the height of trees and shrubs around outside borders shall be limited to under five metres.
 - 41.7 A collection of ornamental species and modern cultivars from the *Roseaceae* family that may include trees, shrubs and perennials shall be displayed in the Rose Garden.

Comment: The area surrounding the Rose Garden is the logical place to feature members of the family Rosaceae. Many of the plants grown in private gardens are from this family.

Herb Garden

Objective: 42 To display a variety of herbs that are used for their culinary, medicinal, cosmetic or fragrance qualities.

- Policy:**
- 42.1 Appropriate climbers shall be used to cover the Herb Garden pergola.

Heritage Roses

Objective: 43 To display a range of heritage roses in association with appropriate plants.

Comment: This display is intended to show the wide range of nineteenth to early-twentieth century, and older, roses in settings with other plants that portray the character of that time.

Open woodland areas

Open woodland consists of those areas where it is desirable to retain a significant degree of openness between the trunks of groups of trees for visual or environmental reasons, such as provision of shade for ground level plants.

Objective: 44 To display groups of trees with a relatively open understory for botanical, amenity and/or environmental reasons.

Daffodil Woodland

Objective: 45 To display flowering bulbous plants in an open woodland setting.

Policies: 45.1 The daffodil display shall be maintained as an amenity feature, with other bulbous plants added to lengthen the flowering season.

45.2 Deciduous *Prunus* cultivars shall be planted in the woodland to provide sub-canopy interest and be an extension of the *Prunus* collections.

45.3 Future planting shall be of low growing plants to ensure the open woodland character is maintained.

45.4 Improvement shall be made to the turf area between the Avon River and the pedestrian pathway from the Woodlands Bridge to the hospital boundary.

Comment: The woodlands and daffodil are one of the Garden/Park highlights in spring. The open understory, highlighted by the occasional flowering tree, allows the expanse of flowers to be fully appreciated.

Woodland Garden

Objective: 46 To display a range of woodland plants that prefer moist soil conditions.

Policies: 46.1 Plantings of *Primula* species and cultivars shall be continued.

46.2 A collection of *Viburnum* cultivars and species will continue to be developed in this area.

46.3 Collections of heritage, New Zealand bred cultivars and Chinese *Reticulata* camellias shall continue to be developed.

Objective: 47 To maintain the stream side garden along Addington Brook between the Avon River and Riccarton Avenue for the growing of a wide range of woodland plants.

Pinetum

Objective: 48 To display a representative range of the world's conifers, maintaining a balance between species and cultivars.

Policies: 48.1 Portions of open lawn in the centre and at the southern end of the Pinetum shall be retained.

- 48.2 A low screen of prostrate, dwarf and small size conifers shall be maintained beside the United Car Park.

Dense woodland / shrubland areas

Temperate Asian Collection

Objective: 49 To maintain a representative collection of plants originating from the temperate climate zone of Asia.

- Policies:
- 49.1 The Gardens shall be a repository for temperate Asiatic plants in New Zealand.
- 49.2 The Temperate Asian Collection shall be located in the south/south-east margin of the Gardens, to take advantage of the significant microclimates and topographical features found there.
- 49.3 The Temperate Asian Collection shall incorporate or be linked to the following existing gardens:
- Scarlet Oak border
 - Ilex border
 - Gingko triangle
 - Bamboo border
 - River walk borders
 - Rhododendron border
 - Cherry mound
 - Maple border

Ilex Border

Objective: 50 To display a collection of *Ilex* species and cultivars.

- Policies:
- 50.1 An overhead canopy of trees shall be maintained to provide shelter for the Ilex border.
- 50.2 The Ilex border plantings shall have a link with the Temperate Asian Collection.

Scarlet Oak Border

Objective: 51 To display a mixed group of evergreen and deciduous plants with a ground cover of spring flowering bulbs.

- Policy:
- 51.1 The Scarlet Oak border plantings shall have a link with the Temperate Asian Collection.

Rhododendron Border

Objective: 52 To display New Zealand bred *Rhododendron* cultivars along with appropriate companion plants.

- Policy:
- 52.1 The Rhododendron border plantings shall have a link with the Temperate Asian Collection.

Cherry Mound

Objective: 53 To display a representative range of Japanese cherry cultivars.

- Policies:
- 53.1 The Japanese cherries on the Cherry Mound shall be managed as an amenity feature.
 - 53.2 Older Japanese cherry cultivars of horticultural merit shall be conserved and other material sourced from within New Zealand.
 - 53.3 Bio-inoculant shall be used for disease management, such as for silver leaf.

Comment: This collection will be extended as part of the Peace Bell development.

Pine Mound / Plants of Southern Africa

Objective: 54 To display plants of Southern Africa.

- Policies:
- 54.1 The collection of *Proteaceae* and *Ericaceae* shall be maintained.
 - 54.2 Other South African flowering plants shall be planted to provide added visual interest.

Objective: 55 To retain the character of the pine mound as an amenity feature and focal point.

- Policy:
- 55.1 The *Pinus pinaster* trees shall be retained as a focal point.

Comment: The Pinus pinaster group forms a significant focal point at the eastern end of the Archery lawn and also contributes to the microclimate effect on the mound.

The New Zealand Section

Objective: 56 To display a range of native tree and shrub species, with an emphasis on plants indigenous to Canterbury.

- Policies:
- 56.1 A rare and endangered plant section shall be maintained with its main emphasis on conserving Canterbury, Chatham Island and Marlborough species.
 - 56.2 A Chatham Islands plant collection shall be developed in the New Zealand Section.
 - 56.3 Exotic trees along the Avon River bank, in front of the New Zealand Section, shall be replaced with native plants.
 - 56.4 The New Zealand Section shall be extended to include borders on the southern side of the Western Pond.
-

Australasian Display Garden

Objective: 57 To display ornamental varieties, cultivars and hybrids of New Zealand and Australia suitable for Canterbury growing conditions.

- Policies:
- 57.1 Selected New Zealand bred cultivars shall be used to raise the profile of New Zealand plants.
 - 57.2 Plants that can be grown in a home garden situation shall be demonstrated.
 - 57.3 Plants with relatives on both sides off the Tasman Sea shall be the focus of the Australian border.

Azalea Garden

Objective: 58 To display the horticultural development of deciduous azaleas. To enlarge the Gardens collection of magnolias and *Michelia*, with emphasis on cultivars.

- Policies:
- 58.1 The Azalea Garden shall provide an informal setting with a range of appropriate canopy trees to provide filtered light for the azaleas and associated plants.
 - 58.2 The azalea beds shall be under-planted with appropriate evergreen plants and summer flowering bulbs to provide off-season interest.

Museum Border

Objective: 59 To display a mixed shrub border alongside the Museum/Robert McDougall buildings.

College Border

Objective: 60 To display half-hardy and winter interest plants.

- Policies:
- 60.1 Pergolas and courtyards shall be developed along the length of the Christ's College wall to enable the growing of climbing half-hardy plant material.
 - 60.2 Winter flowering plants shall be included for seasonal interest.

Comment: The College border has a unique micro-climate due to southerly shelter from the line of Sequoiadendrons along the Archery Lawn. This collection can be extended to include the borders next to the toilet block and the Robert McDougall building.

Dahlia Collection

Objective: 61 To display a collection of New Zealand bred cultivars and *Dahlia* species.

Herbert Memorial/Arbour Border

Objective: 62 To display *Cornus florida* and *Kalmia* cultivars.

Children's Educational Playground

Objective: 63 **To create an evolving display within the current playground area for educational play that relates to the plant kingdom.**

Policies: 63.1 Play equipment shall be replaced with apparatus that is designed around plant themes.

63.2 Playground redevelopment shall include links to surrounding collections.

Comment: The existing playground is outdated and does not fit in with the rest of the Gardens. The opportunity exists to create a more interactive experience between parents and their children, which will awaken some curiosity about the plant kingdom.

Weather Station

Objective: 64 **To capture weather data to correlate information for the National Institute of Water and Atmospheric Research (NIWA) as well as the Gardens' own historical records.**

Policy: 64.1 The weather compound shall be retained at its existing size and location.

Kate Sheppard Memorial Walk

Objective: 65 **To commemorate over one hundred years of women's suffrage in New Zealand – from 1893 to 1993.**

Policy: 65.1 White flowering *Camellia* cultivars and species shall be displayed along the Kate Sheppard Walk.

Conservatories

Cunningham House

Objective: 66 **To display tropical and subtropical plants in a semi-natural environment, with lower light level plants situated on the ground floor of the Cunningham House and higher light level plants on the upper storey.**

Policies: 66.1 Interpretation will be provided to enhance the visitor experience.

66.2 Plants within the jungle area, once they reach a height that conflicts with the building, shall be removed and replaced with like material.

Townend House

Objective: 67 **To display as extensive range as possible of cool greenhouse flowering and foliage plants.**

Policies: 67.1 Iconic collections, such as the tuberous begonias, shall be retained and developed further, and new cultivars added from local and overseas sources.

67.2 Interpretation will be provided to identify flowering crops and their growing requirements.

67.3 Growing conditions will be altered to improve the need of each crop to maximise flowering longevity. This included installing louvers for better ventilation.

Garrick House

Objective: 68 To display a range of cacti to illustrate their diversity, modes of growth and environmental conditions.

Gilpin House

Objective: 69 To display the most extensive range of the *Orchidaceae* family and associated plants in a natural environmental setting.

Fern House

Objective: 70 To display a range of indigenous temperate ferns in a natural setting otherwise unable to be grown in Canterbury conditions.

Policy: 70.1 The indigenous temperate fern collection shall be linked to the Native Section Fern collections and Mona Vale fernery.

Foweraker Alpine Plant House

Objective: 71 To display a selection of indigenous and exotic alpine plants that are difficult to grow outside for the enjoyment and education of the public.

Policy: 71.1 A raised bed of alpines shall be maintained, with displays changed regularly to provide continuity of display.

Objective: 72 To display a selection of rare and endangered alpine plants in the garden around the Alpine House.

Policy: 72.1 An alpine rock garden shall be maintained to the north and west of the Alpine House to form an appropriate surround to the indoor alpine connection.

Comment: The existing Alpine House is too small to easily provide a more natural display of alpine plants. It also lacks space for a larger display of New Zealand alpine plants. As many New Zealand alpine plants require overhead protection in winter, and are generally not accessible to the public in their natural environment, a new or enlarged house is a desirable long term objective.

Conservatory Complex Surrounds

Objective: 73 **To display, externally, a reflection of the plant collections held within the complex, and to create a pseudo-tropical garden, with emphasis on interesting and bold foliage and flowers.**

Policies: 73.1 A hardy collection of cacti and succulents shall be displayed in the conservatory complex surrounds.

73.2 Hardy native ferns shall be displayed in the conservatory complex surrounds.

73.3 The north wall of the Fernery shall be planted with North American ferns.

73.4 A selection of indigenous and exotic alpine plants shall be displayed to supplement the limited space of the Alpine House.

Comment: The Fragrant Garden has been in place for some years and has never lived up to its name. Even with better selection and sighting of plants, the situation has not improved. This is backed up by staff of the Hamilton Botanical Gardens where there has been a similar outcome.

Bonsai Collection

Objective: 74 **To display a representative range of bonsai plants in an appropriate Japanese style setting that is readily accessible to the public.**

Policy: 74.1 An appropriate site shall be located for a bonsai display in the Gardens.

Comment: The existing bonsai collection is currently situated in an out of the way secluded site, easily missed by many visitors. This collection can only be continued and developed with the appropriate resources and specially trained staff.

Carnivorous Plants

Objective: 75 **To display a range of insectivorous plants and provide environments suited for their individual requirements.**

Policy: 75.1 New species of carnivorous plants shall be imported to improve and extent the current collection.

Quarantine Facility

Objective: 76 **To investigate, or make suitable arrangements with an external provider, to develop and maintain a facility for the sole purpose of importing new plant material for botanic garden collections, research and plant breeding.**

21. Wildlife

Objective: 77 **To encourage desirable wildlife and eliminate undesirable wildlife pursuant to the Wildlife Act 1953.**

Policies: 77.1 Native bush birds shall be encouraged to visit and/or live in the Gardens.

Comment: Native birds should be encouraged in the Gardens where their presence does not unduly conflict with plant collection aims.

77.2 Riverside vegetation important for the spawning of native fish shall, as far as possible, be retained at the appropriate times of the year.

22. Buildings

Objective: 78 **To maintain existing buildings and ensure the design and placement of building extensions and new buildings is appropriate and co-ordinated with existing structures.**

Policies: 78.1 New buildings, extensions and replacements shall meet the following criteria:

- Their placement shall reflect the layout displayed in the Existing Site Features map (see Figure 8.1, Page 10).
- Their intended use shall be appropriate to this plan's goals, objectives, and policies.
- They shall be compatible in colour and design with their surroundings and with existing buildings.

78.2 All buildings in the Gardens shall be maintained to a high standard.

Comment: The Cunningham House is the most valuable and visually significant building in the Gardens with an estimated replacement value of over \$1.1 million. It is important that the existing building be kept in good repair.

PART IV

ISSUES AND ACTION PLAN



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23. LIVING COLLECTIONS

Explanation:

“Living collections” are the collections of plants that are systematically organised in the Gardens.

Objective:

In the Gardens there will be maintained, displayed and interpreted to the highest standards, plant collections that are purpose driven, prioritised, systematically documented and enhanced as needs and opportunities arise.

The importance of botanical collections

Botanical collections are the life blood of botanic gardens. They are the most important element that distinguishes a botanic garden from other green space areas. Other features of the gardens such as landscaping, education, monuments and buildings are there to serve the collections or are based on the collections. The integrity, representativeness and health of the botanical collections of the gardens are important for the efficient function of a botanic garden.

Building up the collection of plants in a botanic gardens involves knowing what the focus of the gardens will be¹⁴. It also means excellent sourcing of specimens and effective horticultural industry relationships. It means good collection placement and management. It means knowing through a high quality database what the collections contain and how collections are used. It also means ongoing long-term commitment to maintenance, enhancement and replacement of plant holdings.

Although botanic gardens are often regarded by the public in New Zealand as places to simply go to and to relax in, it is actually the collections of plants that provide the opportunity for this. The term ‘botanic garden’ is both *botanical* and *garden* in its purpose and function and so is not only a place of beauty, pleasure and relaxation,

¹⁴ Oates, M. R. 1993. The botanic garden system in New Zealand - the way ahead. In: Froggatt, P. and M. Oates (eds.), *People, Plants and Conservation. Botanic Gardens into the 21st century*. RNZIH. Pp. 3-5.

but also a place of learning, research and conservation.

Living collections in botanic gardens are an investment. Every specimen has had to be collected, documented, propagated, grown on and planted. Interpretation of collections and specimens is an additional cost. Some species found in botanic gardens have been obtained literally at the cost of human lives. In other instances, trialing of plants in botanic gardens has led to billion dollar industries, an example being the oil palm industry in Southeast Asia.

Botanic gardens may be the only places where there are examples of species extinct in the wild or critical to the survival of wild plant populations. In New Zealand, the difficulty of re-importing exotic species once they are totally lost from cultivation means that rarely grown species assume considerable value regardless of their occurrence in their place of origin.

Gardens collections

The Gardens has a large and well established array of collections, many built up from the late nineteenth and early twentieth century. It has a reasonably good record for maintaining collections. Although it is not usually indicated with any great precision how large a botanic Gardens collections are (perhaps most do not know), it seems likely that Christchurch’s Gardens collections are large by world standards. Current estimates are that Christchurch has about 28,000 accessions¹⁵ listed on spread sheets, with probably another 6-12,000 (mainly from the conservatories) not listed. These probably represent between 7-9000 taxa¹⁶ in total.

It is recognised that for the Gardens there are general principles for guiding the development, management and dismantling (de-accessioning) of collections.

¹⁵ A plant is accessioned into the collection when it is physically acquired, is assigned a catalogue number, and formal information about its provenance is noted and recorded.

¹⁶ Groups of genetically similar organisms that are classified together as a species, genus, family and so forth.

Collections principles for the Gardens

- Focus on a smaller number of high value primary collections.
- Recognition of the value of secondary collections for specific purposes.
- Maintenance of essential facilities and expertise for collections.
- Good identification and databasing of collections.
- A high level of overall curation management and interpretation.
- Irreplaceable elements of core collections are replicated elsewhere.
- Dispersal of some collections to other Council green space areas in the city.
- Collections are put in context of the city and region, and other collection centres.

The core holdings in the Gardens, built up over many decades, are comprehensive in scope, taxonomically, geographically, ecologically and horticulturally. A number of individual collections are of high quality nationally, and even internationally, although, in other instances, there are potentially high grade collections that deserve to be of higher quality. The most urgent need is to know what is in the collections, not only in terms of completing the data base but also through ensuring that there is correct identification in all cases.

General issues for the Gardens' collections

- The large size and diversity of the Gardens holdings, which makes it difficult to identify and focus on a small number of key collections.
- Over the last three decades collection development has been at the level of decision by individual section curators, which can make it difficult to achieve across garden cohesiveness.

- There are some smaller collections not developed to their full potential, which can lead to inefficient use of resources and overall garden fragmentation.
 - Some collections are unnecessarily dispersed (components found in different parts of the Gardens) or mixed (there are extraneous elements found in specific collection areas).
 - Collections may not be in the best available site, considering that the Gardens has a lack of topographic variation, major soil types and climate – small and subtle variations can be critical for growing some plants, so every advantage must be made of apparently minor site variations.
 - Databasing and identification are often incomplete at best and rudimentary at worst – there is the need to clean records of inaccuracies.
 - There is less interpretative signage than desirable and incomplete labeling for some important collections – this reduces the value of collections, especially for the visitor.
 - Some significant collections are inaccessible to the public or access is very limited – there are, therefore, missed opportunities for people to experience and learn about those plants.
 - Some significant collections that one would expect to see present are missing (for example, the lack of a definitive collection of Canterbury plants) – this reduces expectations and misses opportunities.
 - There is ongoing debate about the relative importance of, and space and prominence given to, New Zealand natives and exotic plants – this requires a strategic decision that has long term implications for the Gardens emphasis.
-

- The general appearance of the Gardens, especially for the first time visitor, is one of dominance by exotic plants.¹⁷

One further issue of concern to the Gardens is that of the problems involved in importing plant materials from overseas. Currently, the costs and intricate procedures under the Biosecurity Act and Hazardous Substances and New Organisms Act make importation of species not already in New Zealand virtually impossible except for the most compelling of cases. However, even for species already known to be in New Zealand importation can be an uncertain and lengthy process.

Public viewpoint

Public consultation in 2004 identified a wide range of collection related issues, with a key one being that collections should be the core of the Gardens business. Most submissions were positive in nature and there was a lot of praise for the collections generally. Issues were raised regarding the arrangement of collections and a number of submissions called for a more taxonomic basis for these. Increased collections of Pacific basin temperate floras, grasslands and groupings of plants for colour were the most common suggestions for new collections. There was general agreement that the Gardens have a role in showcasing particular plants, with special attention being had to local species.

Trees attracted considerable comment, ranging from appreciation of the tree canopy structure to suggestions that the trees were crowding the Gardens. Greater forward planning for tree replacement was supported.

Indigenous (native) plants attracted considerable attention as an issue. It was a subject where people expressed a range of viewpoints. Overall, there was little support for reducing the proportion

¹⁷ This is a reflection of the early decades of the Gardens, its colonial background and the introduction into the Christchurch region of many thousands of exotic species, especially trees, in the early days of European settlement. It is important, though, that the Gardens collections relate to the botanical essence of Christchurch and the Canterbury region. The Gardens should both serve the region and showcase it – both its native flora and the introduced plants that are also now part of the regional heritage.

of native plants in the Gardens. However, although there was support for increasing the proportion, this was balanced with submissions against changing the present mix. There was also the suggestion made that the Gardens should focus its native collections on species not normally accessible to or seen by the public (such as rare and endangered plants).

A Canterbury focused collection was a common request. The ‘original purpose’ and ‘English woodland’ character, along with the historical role of acclimatising plants to New Zealand conditions, was also seen by a number of submitters as crucial in determining the relative importance to be placed on native and exotic plant collections.

The subject of glasshouses was addressed in twenty submissions, which generally indicated a high level of satisfaction in the glasshouse resource. A number, though, were also in support of there being additional display houses and extensions to some of the present glasshouses. The inadequacies of some of the present glasshouses, especially the small size of the bulb/alpine house and the need for better ventilation/cooling in the Townend House, was noted. Other points made were on the desirability of having automatic doors, the difficulty in locating the glasshouses, the need for security cameras, and the possibility of having a ‘walk through’ cactus house.

Others found the conservatories to be impressive and interesting and the development of an orchid house was seen to be a good move. There was a general awareness of the need for improved facilities, of the value of the conservatory collections and of the need for expansion of the greenhouse collections. In addition, there was awareness of the uniqueness of the collections, and security and health issues affecting the housing of the collections, as being pressing issues.

Specific issues

Collections database

A major priority need is the purchase and use of a modern comprehensive data base for the Gardens. The primary reason is for collections inventory

and management. In common with a library and a supermarket, a botanic garden requires a good inventory of its collections (or stock) so that there is a record of what it has, what is missing, where specimens have been obtained, their growth history, the health of collections, and what there may be for exchange or use, such as for education and research.

A good data base, however, does far more than just allow inventory. It links growing collections with the herbarium and image collections, and with seed collections. It integrates data on library resources, interest groups and members of support organisations and individuals. Modern systems can be linked to geographic location information and to images such as photographs and drawings. A botanic garden data base will also link to other green space areas and reserves and to City Council data bases such as general asset management systems, as well as allow networking with the data bases of other botanic gardens and research/education institutions.

The size of the Gardens living collections and the varied outputs of information means there is a need to secure a reliable 'relational data base', which has the capacity to handle large numbers of complex records. A business plan has been prepared for the acquisition of such data base to replace the present interim spread sheet data base. This also identifies the case for such a data base to have the capability to link with interactive terminals where the public is able to obtain information on plants, see where they are growing in the Gardens and know how to obtain and grow them.

Primary core collections

Can the Gardens focus on an identified core of collections for which Christchurch will become a major repository, nationally and even internationally? To be a core collection means that the collection:

- Scores high against general collection criteria.
- Is identified and documented to a very high standard.

Table 23.1: General collection criteria

Value	Measure
Scientific	Does the collection make a significant contribution at any scale to scientific knowledge and research, or does it provide important research material?
Conservation	Does the collection preserve threatened species, provide material for restoration projects or in any other way facilitate the achieving of biodiversity conservation?
Cultural	Does the collection make a significant contribution to regional or national cultural needs, including providing a source of materials for cultural use and training?
Education/ Awareness	Does the collection contribute to formal education or more informal awareness of botanical and ecological principles, plant knowledge, conservation biology, horticulture or relationships between people and plants?
Amenity horticultural	Does the collection contribute to raising awareness of the role of amenity horticulture, lead to providing training and capacity building of people working in the horticultural field, profile new plants (including trialling) and provide sources of acceptable plant material?
Economic	Does the collection contain species that are of known economic value and does it provide an opportunity for the trialling of plants that have proven or potential economic value?
Maintenance capability	Can the collection be readily maintained, given present facilities and climatic/soil conditions, or is it likely that such conditions and facilities can be acquired within the foreseeable future?
Replication	Is this a collection that will have high value as a primary collection not held elsewhere or are there numerous duplicate collections (and should the Gardens support those other collections instead?)?

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- Has long term security and will not be put at risk of loss, damage or depletion. (in some instances, this may be part of a cluster of plans for operational and curatorial efficiency).
- Will be given priority in the acquisition of new material. Table 23.2 is a draft list of all collections (existing and proposed) that are considered to be of particular importance to the Gardens. Proposed collections that are not already in place, or where
- Has priority in labeling and interpretation. there is need to form a new collection by aggregating existing scattered elements, are identified by 'NEW' in the 'status' column and by shading in the first column.
- Is given prominence on the Gardens Internet pages and in marketing.
- Has a specific management plan

Table 23.2: Existing and proposed Garden collections

Collection	Category	Status	Brief description/size	Reason for iconic status	Issues
Perennial border	Horticultural	International EXISTING	Good comprehensive collection in a prominent location and currently being extensively reorganized. Total number of species high.	Reputed to be the largest in Australasia. A kind of garden style that has now become rare. High public profile.	<ul style="list-style-type: none"> ▪ High maintenance. ▪ Interpretation and labeling needed. ▪ A dry herbaceous border.
Tuberous begonias	Horticulture	International EXISTING	Valuable collection involving a major breeding programme within the Gardens.	Has become an icon for Christchurch and is a world class collection. Has a fact sheet.	<ul style="list-style-type: none"> ▪ Need to maintain modern hybrids. ▪ Better display house needed. ▪ Further interpretation needed.
Plants of eastern South Island and Chatham Islands	Ecological	International NEW	At present not consolidated, but there are good elements present. Can be linked into the existing native plant areas or into the design of the proposed Gondwana Garden. Needs a range of micro-habitats.	Christchurch should be the place to see these plants – very big role for conservation and education and helping people to know what are their local icons.	<ul style="list-style-type: none"> ▪ Collection to build up. ▪ Need to rewrite draft collections plan. ▪ Accession of plants required. ▪ Need to decide on one or more sites. ▪ Relationship to Gondwana Garden?

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Collection	Category	Status	Brief description/size	Reason for iconic status	Issues
Genus <i>Hebe</i> (koromiko) including segregate and closely related genera such as <i>Parahebe</i> and <i>Heliohebe</i>	Taxonomic	International NEW	The Gardens has a number of species and cultivars but is not identified as a distinct collection. This is the largest genus in New Zealand, with many hybrids and cultivars.	A notable New Zealand genus that represents the evolution of the New Zealand flora, is the source of many highly regarded garden cultivars, demonstrates hybridism well and also shows ecological partitioning (for example, with limestone species). Highly iconic.	<ul style="list-style-type: none"> ▪ Collection needs an identity. ▪ Identification required. ▪ Possible dispersal across the City. ▪ How to select cultivars ▪ Interpretation needed. ▪ Relationship to Gondwana Garden?
Family Asteraceae (Compositae) – the daisies	Taxonomic	International NEW	Collection does not exist at present – proposed as part of the Gondwana Garden.	The world's largest plant family and ideal for interpretation of evolution, plant form, function and use. Is mostly in temperate or montane arid zone, so readily grown in Christchurch.	<ul style="list-style-type: none"> ▪ Need plan for the collection. ▪ Display strategy necessary. ▪ Draft lists of taxa required. ▪ Site needed (in Gondwana garden?). ▪ Source and acquire plants.
Ancient plants of the New Zealand region	Ecological	National NEW	Draft plans drawn up several years ago. Part of Gondwana collection.	Part of larger garden to show history of New Zealand plants and contribution to the horticultural world.	<ul style="list-style-type: none"> ▪ Final planning. ▪ Final position in gardens. ▪ Incorporate geology.
Peace garden	People and plants	National NEW	Being planned.	Associate with gifted peace bell as part of international network.	<ul style="list-style-type: none"> ▪ Final planning. ▪ Final position in the Gardens.
Temperate trees	Ecological	National EXISTING	Throughout the whole Gardens.	Botanic gardens are known for their treescapes and valuable collections of trees, some highly historic or notable.	<ul style="list-style-type: none"> ▪ Complete asset inventory. ▪ Propagation programme. ▪ Tree replacement policy. ▪ Source notable species.

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Collection	Category	Status	Brief description/size	Reason for iconic status	Issues
Woodland plants	Ecological	National EXISTING	The main areas of exotic woodlands are on the south side of the Avon River loop, and here they are a major public feature. Includes comprehensive collections of several woodland genera, for example <i>Primula</i> .	Major Gardens feature, with good opportunity for considerable expansion of selected genera and geographic groups. Is probably the most photographed feature of the Gardens.	<ul style="list-style-type: none"> ▪ Geographical development. ▪ Under-planting expansion. ▪ Balance between use and display.
Bonsai trees	Horticulture	National EXISTING	About eighty trees, but some of the best have been stolen. Currently in a poor public viewing area.	Only public botanic garden in New Zealand with such a collection. Growing Asian population in the city. Prospect of further specimens.	<ul style="list-style-type: none"> ▪ Reliant on having staff expertise. ▪ Needs much improved location. ▪ Security issues. ▪ Young collection.
Hardy monocot trees (for example, palms, yucca, cabbage trees)	Horticulture	National STARTED	A core collection of approximately thirty species of <i>Yucca</i> , and a collection of hardy palms started. Location is scattered.	Not as well known to public as should be, but can be grown outside in New Zealand and starting to get known.	<ul style="list-style-type: none"> ▪ Publicity needed. ▪ Decision required on placing/site links. ▪ Acquisition of new material. ▪ Interpretation and labeling. ▪ Interpretive materials needed.
<i>Rosaceae</i> (family)	Taxonomic	National EXISTING	Two sites – the formal rose garden at the garden core and a heritage collection of old cultivars and species by the Murray Aynsley Lawn in the woodland area dispersed collection. Outer perimeter of formal rose garden identified for other <i>Rosaceae</i> cultivars and species.	Important plant family, well known in cultivation and grows particularly well in Christchurch. Roses in formal garden are subject to an assessment system.	<ul style="list-style-type: none"> ▪ Continue to acquire new plants. ▪ Continue annual assessment. ▪ Link to collections elsewhere. ▪ Redevelop <i>Rosaceae</i> beds. ▪ Interpretive materials needed.

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Collection	Category	Status	Brief description/size	Reason for iconic status	Issues
Cacti and succulents	Taxonomic	National EXISTING	Display material in limited space in conservatories. Most plants are in nursery glasshouses.	Reputed to hold largest New Zealand collection of these. People are fascinated by this plant group.	<ul style="list-style-type: none"> ▪ Outdoor display of hardy species. ▪ Interpretive materials needed. ▪ Display space far too small. ▪ Much of collection not seen.
Bulbs ¹⁸	Taxonomic	National EXISTING	Hold a good to comprehensive collection in rockery and alpine house but limited space and curatorial time.	These grow well in Christchurch and there is an opportunity to complete holdings in some genera.	<ul style="list-style-type: none"> ▪ Acquisition of new species. ▪ Long term display changes. ▪ Additional assistance needed. ▪ Link to Mona Vale; for example, irises.
Pinetum	Taxonomic	National EXISTING	Well established pinetum at west end of Gardens, in area of limited space, with plants also present in other collections.	Already prominent and many species are good plants for growing in home gardens.	<ul style="list-style-type: none"> ▪ Link better other pinetums. ▪ Interpretation.
Rare and endangered plants	Cultural	National EXISTING	Existing bed of New Zealand species is small and needs to be renewed/expanded with better flow. Exotic (global) rare species scattered throughout the Gardens.	Good conservation messages are generated by such a collection and can be linked to plant sales by the Gardens.	<ul style="list-style-type: none"> ▪ Renew/expand existing area. ▪ List of key taxa. ▪ Interpretation and theming. ▪ Acquire additional plants.
New Zealand Leguminosae	Taxonomic	National NEW	A good nucleus of native brooms in native section of the Gardens.	Under-appreciated but very distinctive element in the native flora that has very distinctive eastern South Island elements.	<ul style="list-style-type: none"> ▪ Re-positioning of at least some. ▪ Filling gaps in collection. ▪ Interpretation.

¹⁸ Interpreted loosely to include tubers, rhizomes and other storage organs.

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Collection	Category	Status	Brief description/size	Reason for iconic status	Issues
New Zealand grasses and sedges	Taxonomic	National NEW	Already have a reasonable range but tend to be used as fillers rather than in own right. So, no discrete collection at one site.	Most grow well in Christchurch and certainly an undervalued group of species (most plantings tend to be restricted to very few species at present). There are opportunities to feature a range of native 'turf' species for lawns.	<ul style="list-style-type: none"> ▪ Stock take of what is held. ▪ Collection/display strategy required. ▪ Acquire specimens to fill gaps. ▪ Liaise with Landcare Research over turf species.
Heritage collections, for example, roses, Maori crops, vegetables and fruit trees, including a specific Maori ethno botanical sub-collection	People and plants	National STARTED	Heritage roses held in woodland area near Murray Aynsley Lawn, and some vegetables in the Curators House garden.	Many collections need a home and potential for linkages, for example, with Southern Seed Exchange, Koanga Gardens, New Zealand Tree Crops Association. Emphasis on Canterbury.	<ul style="list-style-type: none"> ▪ Consolidation necessary because limited space. ▪ Collaboration required, including with iwi. ▪ Use of Hagley Park? ▪ Germplasm bank development. ▪ Education/heritage programme.
New Zealand native cultivars	Horticultural	Regional EXISTING	A collection of shrubs and flax is held near the Gardens operational facilities area, but limited expansion space is available. Some cultivars of native species are held in other parts of the Gardens, for example, near the Cockayne Garden.	Very big opportunities for using these collections to trial cultivars and recommend good ones to people for their own gardens, as well as trialing for planting public areas.	<ul style="list-style-type: none"> ▪ Consolidation required. ▪ Display strategy needed. ▪ Link to other collections. ▪ Interpretation and labels. ▪ Space an issue.
Ferns and their relatives with emphasis on New Zealand	Taxonomic	Regional EXISTING	Two collection areas (Gardens and Mona Vale) but the Gardens site needs to be redeveloped to concentrate on interpretation, and identifications need to be checked. Can be readily added to.	An iconic New Zealand group of plants. Concept was originally for Gardens and Mona Vale to be a national collection.	<ul style="list-style-type: none"> ▪ Coordinate with Mona Vale. ▪ Raise to national status. ▪ Cull out surplus material. ▪ Re-identifications needed.

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Collection	Category	Status	Brief description/size	Reason for iconic status	Issues
Alpine and sub alpine plants of the eastern South Island	Ecological	Regional STARTED	This would have to include a redevelopment of the existing native plant rockery adjacent to the Cockayne Memorial Garden but, if embarked on in full, would require construction of a new purpose built scree rockery and operational funding to maintain this.	This would not be a cheap project and would probably require an additional staff position for ongoing maintenance and development. However, it includes a range of species that are important icons for the region. It might be considered part of the proposed Gondwana Garden.	<ul style="list-style-type: none"> ▪ Are cost-benefits. ▪ Need to decide on siting and if on one site or more than one. ▪ Range of species to be accommodated. ▪ Ecological design. ▪ Interpretation.
Survival plants	People and plants	Regional NEW	Collection of plants that are basic essentials for humanity.	Draw attention to the key 18-20 plants that sustains humans (photosynthesis, crops, fuel and medicines).	<ul style="list-style-type: none"> ▪ Does not need a large area.
Iconic plants of New Zealand	People and plants	Regional NEW	Yet to be planned and built.	Reminder to people about the plants that we really identify with as our own.	<ul style="list-style-type: none"> ▪ Change selection annually. ▪ Design and implementation.
Children's garden	People and plants	Regional NEW	Yet to be planned and built.	Relating children to plants at an early age. Good model available in the recently constructed Potter children's garden at Auckland Regional Gardens.	<ul style="list-style-type: none"> ▪ Final planning. ▪ Final position in the Gardens.
A showcase collection of Canterbury – new cultivars bred locally and important crops	People and plants	Regional NEW	Yet to be planned and built, but there are elements in place and the collection has been discussed with some stakeholders.	This collection would demonstrate strengths and achievements of Canterbury horticultural breeders, as well as show examples of important new crops for the region, such as grapes, olives and lavender. Could be a dispersed collection.	<ul style="list-style-type: none"> ▪ Stakeholder buy-in needed. ▪ Selection of site(s) required. ▪ Selection of plants to be featured. ▪ Link to marketing.

The place of native (indigenous) plant collections

Existing entrances to the Gardens are characterised by exotic species, usually trees. That there are native (indigenous) trees scattered among the tree population may well escape the knowledge of many visitors. It is only when arriving at the south western part of the Gardens that native species dominate, but only an estimated five percent of visitors find their way to this part of the Gardens. Yet, native New Zealand (indigenous) plants, and especially those of the Canterbury region, are an important part of Christchurch's heritage.

Fifty three submissions from the public consultation in 2004 raised issues concerning native New Zealand plants. Although there was little support for reducing the present proportion of native plants in the Gardens, many submitters valued the "English feel" of the Gardens. The question, though, is how well do the general public know about the native plant sections of the Gardens? Certainly, these areas get used less than other sections of the Gardens. There is scope for the entrances to the Gardens to feature New Zealand plants along with exotic species.

The submission that the Gardens should focus its native plant collections on those aspects not usually seen by the majority of visitors is timely. Examples include rare and endangered species; plants of localised soil types such as limestone, dolomite and serpentine; montane to lower alpine plants; and plants of the depleted 'grey' shrublands of the eastern South Island. There is also opportunity to use particular displays as 'windows of opportunity' to direct people to sites within, and close, to the city where they can see such plants in the wild. Examples include Travis Wetland, the Port Hills and, further afield, Castle Hill, Arthur's Pass and Hinewai Reserve near Akaroa.

A number of existing or proposed New Zealand native plant collections have been referred to in Table 23.2:

- The genus *Hebe* – a notable group of plants virtually confined to New Zealand, this country's largest genus and an excellent case study of adaptive radiation, habitat selection and variety in growth forms.
 - Ancient plants of the New Zealand region – some of the major ancestral plants of New Zealand, including some of the 'living fossil' plants.
 - Rare and endangered plants of New Zealand - existing as a small bed that needs to be redesigned along more ecological lines and concentrate on important regional species and genera.
 - New Zealand legumes, especially featuring the tree brooms.
 - New Zealand grasses, sedges and rushes, featuring one or more displays where people can both identify important species and appreciate their ecology and role in ecosystem health.
 - Heritage plants, and especially plants used traditionally by Maori – this may be part of a larger collection of crop plants, survival plants and important traditional plants that might be located in various parts of the Gardens and linked by a trail.
 - New Zealand native cultivars – a poorly labelled area currently exists for these, but other cultivars are scattered throughout various parts of the Gardens; the collection needs to be comprehensive, well-labelled and clearly aggregated.
 - Ferns and their relatives, especially from New Zealand – the present small fern house should be interpretive, with the major collection level accessions being concentrated in the New Zealand native forest areas of the Gardens and at Mona Vale.
- Plants characteristic of the eastern South Island and Chatham Islands, featuring especially the characteristic 'grey scrub' of the region and its divaricating shrubs.

- The iconic plants of New Zealand – an opportunity to work closely with the annual survey of iconic plants held by the Isaac Centre for Nature Conservation (Lincoln University) and the New Zealand Plant Conservation Network, with a small collection being in a highly visible location.

Some other collections that exist or have been proposed include New Zealand elements but do not necessarily concentrate on New Zealand native plants. Examples include proposed collections of hardy monocotyledon trees and the family Asteraceae (daisies).

The present concentrated area of native plants needs to undergo some redevelopment and redesign. There also needs to be a renewed programme of replacement, especially for shrubs. Options for this part of the gardens includes maintaining it simply as a ‘native treescape’, giving it an emphasis on Canterbury plants and simulating one or more forest types (for example, a Banks Peninsula forest) or concentrating on wildlife habitat. As part of this, the Cockayne Memorial Garden could be redeveloped to specifically display plants and genera that commemorate the life and research of Dr Leonard Cockayne, New Zealand’s pioneer ecologist, including examples of natural hybrids.

Two further areas that have already been suggested for development of more native plant collections are the Avon River riparian zone and Riccarton Stream at the south end of the Pinetum (a Canterbury stream ecosystem), and the New Zealand Section Lake, which could be enhanced to provide an authentic native swamp vegetation. The Avon River is already partly revegetated with New Zealand native plants, but there is scope for expansion of this, especially in collaboration with Ngāi Tahu.

The Gondwana project

Gondwana is the former super continent of the Southern Hemisphere that included South America, Africa, peninsula India, Australia, Antarctica, New Caledonia and New Zealand. This continent started to break up and separate many tens of millions of years ago. Thus the story of Gondwana is the story of the floras of the Southern Hemisphere, including New Zealand.

For New Zealand the story has been complicated by subsequent foundering of much of the primeval land mass so that by the mid Tertiary period (thirty million years ago) New Zealand probably consisted of a series of low lying islands. Subsequently, new flora elements have arrived here by long distance dispersal and have evolved into many species endemic to New Zealand (that is, found as wild species nowhere else).

Ancient elements of the flora include the podocarp pines such as rimu and totara, kauri, southern beeches, pepper tree (*Pseudowintera*), the living fossils *Loxoma* and *Tmesipteris*, and the cabbage tree. More recent elements include the mountain daisies (*Celmisia*), the koromikos (*Hebe*) and many of our grasses and ferns.

The concept for a Gondwana section of the Gardens is to provide examples and interpretation of the following:

- Plant groups chiefly from the Southern Hemisphere, but also including living fossils, such as ginkgo, the wollemi pine (and other members of the family *Araucariaceae*) and *Tmesipteris*. Where possible, these would be displayed as living plants alongside examples of ancient fossils of the same organisms.
- Predominantly Southern Hemisphere plant groups (families or genera) that have distribution patterns centred on Gondwana. Included here would be podocarps, the restiads (family *Restionaceae*), proteas (family *Proteaceae*) and the southern beeches and araucariads.
- Closely related species or genera that have trans-oceanic distribution across parts of the Southern Hemisphere.
- Southern Hemisphere plants (and especially those of New Zealand) that have made outstanding contributions to global horticulture and economies.
- Creation of plant associations that mimic those of ancient times; for example; using cycads, tree ferns, club mosses and primitive flowering plants and conifers to recreate a “dinosaur” forest.

This project has potential to take under its general umbrella several proposed new collections, including New Zealand grasses, araucariads, examples of rare New Zealand plants on different soil types, plants of the Chatham Islands and the genus *Hebe* and its associates. A suggested site is the north-west portion of the Gardens along the loop of the Avon River between the Armagh Street bridge and West Bridge further around towards Riccarton Avenue. Some start up finance is available and a consultants report and preliminary landscaping has been prepared for this project.

Tree collections and assemblages

The Gardens is noted for the predominance of trees over much of its area. The tree environment of the Gardens, Hagley Park and Christchurch generally reflects a reaction by European settlers to the seemingly windswept and sometimes treeless nature of the countryside that greeted them. Certainly within a few years of their arrival Christchurch and the adjacent farmland was being transformed into a new landscape in which exotic trees were especially important.

The mosaic of trees, lawns and beds of shrubs and herbaceous plants meets with generally favourable comment by visitors to the gardens. The trees provide a welcome relief from the extremes of the seasons, especially in summer and winter, and in spring and autumn provide dazzling displays of colour. They also provide valuable wildlife, especially bird, habitat.

A major issue with the present array of trees is that many are nearing the end of their lifespan and are starting to enter a period of decline and senescence. This will result in short to medium term loss of the tree canopy for some parts of the Gardens. A positive aspect is that, as part of this process, deliberate decisions can be made on replacement – if it should be with the same species or a different one, if it should be an exotic or native species, or if it should be left open and as a canopy gap.

An important aspect of tree replacement is consideration of the contribution, both negative and positive, that trees make to human health, environment health and build and infra-structure health. An example of the environmental health

issue is that trees generally contribute to two aspects of air quality - they emit varying levels of volatile organic compounds (especially isoprene and monoterpenes) while also removing particulates (especially PM₁₀). Tree species differ in both their emission rates and their “scrubbing” ability so that some trees can be regarded as more “environmentally friendly” than others.

The programme of replacement provides some opportunities for rationalising where trees currently are sited and the placing of new trees in appropriate parts of the Gardens where they more clearly relate to existing and future collections. Many of the older trees in the Gardens reflect past planting patterns and patterns of path circulation, and so may have little relationship to what is now planted nearby. A deliberate replacement policy can go a long way to remedying this problem.

Conservatory collections

The current conservatories have been developed in a piecemeal fashion over a period of time. The major and oldest house is the tropical Cuningham House, which is almost eighty years old but still in relatively good condition. As a heritage structure, its significant alteration or removal is not contemplated. However, the same does not apply to the Townend House (the second house of this name on the site) and the Garrick, Gilpin and Foweraker Houses. Overall, there is a lack of satisfactory integration of the houses into a single operating unit. Although all, except the Foweraker and Fern Houses, are adjoining there are some differences of level and very different architectural styles. Major collections are held in these houses, including bromeliads, begonias, cacti / succulents, orchids, dracaenas and relatives of these. At present, it is possible to display to the public only a part of the total collection holdings of conservatory plants, especially of the cacti and succulents.

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Table 23.3: Conservatories

House/Situation	Comment/Issue	Recommendation
Townend House	Doors hard to open for older people and the disabled.	Consider sliding doors which also may be better for security.
	Ventilation system unsatisfactory.	Needs a temporary redesign, with alternatives to the present system considered.
	The Townend House tends to be a 'wow' introductory experience for visitors. Has limited space and arrangement, though, especially with the present piping.	New heating system probably not justified, unless there is a new house built with a better shape and heating installed.
	Replacement of glass with UV reducing double glazing.	Should be costed with calculation of savings in heating, etcetera, the decision made on priority.
Garrick House	Far too small for size of collections, resulting in not much being on display, and for having displays of different types of succulent habitat.	As much of the collection cannot be displayed, there is a case for a greatly expanded area of collections space.
	Lack of space for education panels.	Addressing the lack of space really depends on a new house being built.
	Heating should be under-floor.	Probably not worth considering, unless major reconstruction or new houses.
	Elimination of present cabinets and system of presentation required.	Dependent on new house.
	Should be able to walk through cacti and succulent "landscape", but this will require a better security system.	Dependent on new house.
	Ideal to have a smart chip security system embedded in plants, with alarm at the door.	Prudent to price out and consider individual plant security that can be similar to the chip-based library book security systems used.
Gilpin	Education panels.	Being worked on.
	A larger house needed.	Has been suggested, but for orchids themselves this would mean far more off-site holding space needing to be provided, and possibly another staff member spending most of their time on orchids. Could be justified for bromeliads.
Cunningham House	Very inflexible interior arrangement at present – could possibly eliminate benches downstairs.	There needs to be an exploration of options, then a decision made on the feasibility and cost-effectiveness of the best of these.
	Lack of sufficient lighting, especially downstairs.	Install reverse night lighting or fluorescent 'daylight' tubes.
	Need to shift heating system pipes or install different form of heating.	Requires feasibility and cost-benefit analysis.
	Is a limitation on plant size, even in central 'jungle' area.	Accept need for periodic replacements.
	Exterior maintenance difficult - does not work efficiently or accord with heritage needs.	Consider eliminating and would be easier with relocation of Fragrant Garden. Need to get a crane in, anyway, to shift present access frame.

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House/Situation	Comment/Issue	Recommendation
Cunningham House (continued)	Need to change bench arrangement upstairs to allow better view looking down into the 'jungle'.	Can plan for this as a short term project, but need to check with heritage authorities.
Foweraker House	Small and cramped and not with a sophisticated climate control.	Need a bigger house and could consider a cool temperate and alpine house with moist air blower to produce 'sub Antarctic' feel. If this is done, may need a drier part of the house.
	Security is a big issue – hence very obvious grill system.	Use of chip technology, although may not work well on herbaceous species, and would need a door check system.
Fern House	Removal of unnecessary and 'nuisance' species important.	Already discussed and to be actioned. Includes removal of pest species such as <i>Salaginella</i> .
	Integrate with the Mona Vale fernery, which would become the 'collection' with the Gardens house being the rain forest experience.	Fern list for both sites being assembled. Needs range of several soils on a micro-scale. Species list and collection of wild ferns from salvage sites, plus Fern Factor plants, required.
	On site interpretation is lacking.	Once changes made this can be considered.
Surrounds of all houses	At least two trees (<i>Cupressus macrocarpa</i> and <i>Thuya plicata</i>) have been identified as strongly affecting house operation through excessive shading	Removal of both trees is urgently required.
	Alpine bulb plant yard is too close to the Cunningham House.	Shift as part of a re-arrangement.
	The Fragrant Garden cramps space by the Cunningham House and may be in wrong place, in terms of its purpose, anyway.	Shift as part of a re-arrangement.
New houses	Cooler house for non-forest species, for example, temperate grassland, herb field and bog species.	Consider as part of a new conservatory complex.
	Economic plants house.	This is worth considering as a powerful education feature, for example, displaying the twenty major crops of the world. Needs to be temperate to sub tropic.
	Bonsai collection rehousing.	Consider incorporation of the bonsai collection into the conservatory complex, possibly in a courtyard.
General issues	Pedestrian circulation is poor.	Only likely to be resolved if there is replacement of houses.
	Not disabled-friendly	Some changes can be made now, for example, better door systems (sliding?), but really dependent on new houses.
	Increased holding glasshouse capacity required.	Significant expansion of houses (except for cacti and succulents) means needing to have additional holding glasshouses.
	Pathways not satisfactory.	Change adjacent pathway system, especially between the Cunningham House and the Rose Garden to create a small piazza.

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House/Situation	Comment/Issue	Recommendation
General issues (continued)	Conservatories provide excellent space for small groups and possibly “boutique” entertainment, for example, cocktail gatherings.	This needs to be considered in future design briefs, but can be engaged in to a limited extent at the present time.

Overall long term recommendations for the conservatories are:

- Retention of the Cuningham House, with minor internal modification, chiefly to improve downstairs lighting and upstairs views from the gallery.
- Change pathway system adjacent to the conservatories to eliminate vehicle traffic between the Cuningham House and the Rose Garden and create a small, paved piazza and congregating area.
- Remove trees that interfere with conservatory function (two in particular noted In Table 23.3 above - *Cupressus macrocarpa* and *Thuya plicata*).
- Relocate the Fragrant Garden.
- Long term - replace Townend, Garrick, and Gilpin Houses with a new purpose designed single house to also incorporate alpine plants and bulbs (some in new alpine/sub Antarctic house and some in an extended succulent house), and link to or rebuild the present Fern House as a temperate rain forest experience.
- Extend the ground plan of such a new house to the adjacent Information Centre Lake.
- Design concepts for a new house should be sought internationally as a major, largely externally funded, facility to celebrate the forthcoming 150th anniversary of the Gardens.

Propagation, seed/germplasm and holding facilities

The Gardens has an existing propagation unit, but this is limited in scope. The greatest need is to be able to successfully propagate a wider variety of plant materials than is currently possible. This needs to take into account the wide range of collection material that is currently held by the Gardens, which ranges from tropical to cool

temperate and long lived trees to annuals. An alternative is to contract out propagation to outside organisations, but this is costly and may also involve security issues with rare and unusual plants.

It is recommended that a small tissue culture unit be established in the Gardens. The acquisition of increasing numbers of species that are amenable to tissue culture, such as orchids, underlines this need.

Associated with propagation are three other desirable areas of development in the Botanic Gardens:

- A seed bank facility, including the ability to store other forms of propagating material (known as germplasm). Discussions with the United Kingdom based Millennium Seed Bank (at the Royal Botanic Gardens in Kew, England) indicates that such a facility can be kept relatively simple but still be capable of expansion as the need arises and resources allow. This facility is discussed in more detail under the Research objective.
- Holding beds that can accommodate a wide range of growing conditions from wet to dry and cool to warm. The present three glasshouses offer only a very limited range of environmental conditions.
- A quarantine house for holding imported plant material. The Gardens had such a glass house in the past but found it difficult to keep up with changing government biosecurity requirements.

Use of collections

Many gardens in recent years have reconsidered policies for restricted and controlled use of collections. Such use may include:

- Collection of material for classroom teaching.

- Student herbarium collections.
- Non-commercial seed and propagating material.
- Commercial collection for propagation.
- Miscellaneous plant parts for decoration and art.
- Edible plant parts such as nuts.

The Gardens will continue to ban the collection of plants and plant parts for direct commercial use. However, other uses such as those outlined above might generally be allowed, provided permission is sought and gained in writing and each application is considered on a one-off basis. For collection of fallen plant materials, such as pine cones and acorns, a blanket approval should be possible, provided there is no removal of these from trees.

Gathering edible fruits such as ginkgo and chestnuts is an interesting issue. In the United States the City of Asheville (North Carolina) recently opened America's first intentionally edible public park¹⁹. The edible park produces multiple varieties of apples, peaches, pears, figs, mulberries, cherries, raspberries, blueberries, nuts and culinary / medicinal herbs. In recent years, the Christchurch City Council has used harvestable tree species for various park plantings. Thus, there has been some movement, albeit adhoc, towards the 'edible park' concept, although it is not well promoted or known in the community at large.

In Christchurch there is often autumn harvesting of ginkgo fruits by the Asian community and several other trees have fruits removed. There is little problem with this, providing those taking the fruits do not disturb other users of the gardens, collection is not excessive, material is taken from the ground only, and people do not climb into the trees or use vigorous and potentially harmful techniques, such as hitting or breaking branches to harvest young fruits that have not yet fallen. There is need to develop, with relevant parts of the local community, a code of practice with respect to such harvesting.

¹⁹ <http://www.cityfarmer.org/ediblepark.html>

The extended botanic garden and satellite collections

The present site of the Gardens is limited not only in area, but also in topography, soils and slope. Consideration needs to be given to establishing satellite collections on other Council green spaces in the City. Examples might include coastal plants at New Brighton, major wetland collections on the northern and eastern periphery of Christchurch, heritage plants at selected parks such as Woodham Park, and arboretum plantings replicating major collections outside the Gardens.

It is recognized that there are very fine collections elsewhere in Christchurch, both on private and public land. This means that Garden holdings of such plants as rhododendrons and camellias, and even roses, should be really considered in terms of how well they contribute to the network of these plants throughout the city, the region and nationally.

There is considerable opportunity for greater use of plantings of critical species for landscaping, such as roadside plantations and growing rare plants in traffic islands²⁰. This needs to start with a pilot survey of holdings in selected target parks, followed by two to three trial plantings. Where plants are used in a situation where they are adjacent to roads, vehicle safety becomes an issue and the appropriate guidelines, for example, on the use of trees near roads, must be consulted. There are also issues of maintenance and continuity that need to be addressed, especially so that Gardens staff time is not diffused needlessly. This means setting an appropriate ongoing operational budget.

Wellington and Hutt Valley provide excellent New Zealand examples of the use of rare and endangered plants for amenity plantings. Here they are used for road median strips and roundabouts. In Hagley Park, as an example, there is opportunity for development of hedges and other amenity plantings along these lines.

²⁰ Given, D. R. 1987. What the conservationist requires of *ex situ* collections. In: Bramwell, D. O. Hamann, V. Heywood and H. Synge (eds.), *Botanic Gardens and the World Conservation Strategy*. Academic. Pp. 103-116; Sawyer, J. 2003 pers. comm.

A collections strategy

Goal 1: *A basic set of priorities will determine setting up, continuation and de-accessioning of collections, along with acceptance of specimens and their display.*

Action 1.1: There will be focus on a clearly identified core of collections, for which Christchurch will be come a major repository. These collections will have priority for placement, expansion and completion. Criteria will take account of botanical, horticultural and cultural aspects of collections, and will be driven by long term considerations. These collections will have distinct management plans.

Action 1.2: Unless there are compelling scientific, commercial or conservation considerations, collections will be, as far as possible, accessible to the public. If this cannot be achieved, collections may be considered for de-accessioning.

Action 1.3: There will be a balance in representation between exotic and native (indigenous) plants, with the strategic emphasis of the gardens on global plant diversity, but also with recognition of the heritage and cultural importance of indigenous New Zealand (especially Canterbury) plants. Collections will reflect seasonality and original elements of the regional landscape.

Action 1.4: New collection proposals will be designed to fill identified gaps in the collections system and will be subject to general collections criteria, availability

of resources and maintenance ability.

Action 1.5: De-accessioning will be by a deliberate decision making process. Priority will be given to replacement that will enhance collections.

Goal 2: *Facilities and expertise will be maintained to ensure that collections are fully resourced and backed up.*

Action 2.1: A programme of curator training and knowledge increase will be used to ensure that collections are managed according to best practice. Recognising that changes in staff often mean loss of specific areas of expertise and interest that may be hard to replace, there will be a deliberate policy of ongoing mentoring to provide for expertise in such areas.

Action 2.2: The need for a new and fully integrated state-of-the-art conservatory complex to replace the present Townend, Garrick and Gilpin, Foweraker and Fern Houses is recognised and recommended as a high profile 150th anniversary project.

Action 2.3: A fully operational state-of-the-art relational database is a priority for cataloguing and managing collections and to allow a high level of service to clients using collections and associated data.

Action 2.4: The herbarium will be maintained and further developed to allow it to operate as a voucher repository, including of images and Geographic Information Systems (GIS) data, for all garden accessions and as a

major reference and research tool for cultivated plants. Associated with the herbarium, photographic records will be maintained of Garden collections, stored according to archival standards and observing copyright requirements.

Action 2.5: Significant plant material of conservation or heritage value will be sought to be preserved through replication in other collections and also maintained as seed or other propagating material in a germplasm bank.

Goal 3: *Comprehensive labelling and interpretation is ensured for all collections, backed up with a complete database of collections. Recognition will be given to there being a range of information that is needed by prospective users of collections. In addition, there will be allowance for restricted and approved collections and use of plant material.*

Action 3.1: Alleviating the backlog in labelling and interpretation will be a priority activity, with highest priority being given to collections of national and international significance.

Action 3.2: Plant labels and display will be simple and succinct, and clearly identifiable and branded as being part of the Gardens. Use will be made of appropriate new technology, such as electronic recognition of information.

Action 3.3: Policy will be developed for making plant collection material available to *bona fide* users, for the study of, and collection from, plants in the gardens, and controlled harvesting of fruits and seeds.

Goal 4: *There will be positive networking between the Gardens and associated institutions and stakeholders, and an intention to actively pursue extension of the Gardens collections to other sites.*

Action 4.1: Collections will be developed on other City Council controlled land as appropriate, especially where it involves plants that are difficult to grow in, or where there are major space constraints within, the present Gardens. This may include future scoping of satellite gardens as part of a city based botanic garden network.

Action 4.2: Collections will be linked to those of other botanic gardens - firstly, in New Zealand and, secondly, overseas - to relevant restoration sites and to major stakeholders and networks in education, amenity horticulture and the horticultural industry.

Goal 5: *Recognising that maintenance of collections requires acquisition of plant materials, some of which may not be in New Zealand, it is intended to ensure that the Gardens policies and practices adhere to legislative requirements and regulations, while maintaining dialogue to facilitate plant introductions that are deemed to be important for key collections.*

Action 5.1: Internal policies and practices will ensure adherence to regulations under the Biosecurity Act 1993, the Hazardous Substances and New Organisms Act 1998, and other relevant legislation.

Action 5.2: Plans will be undertaken for a fully approved containment facility in the Gardens for isolation of newly imported plant material.

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Action 5.3: Discussions on the Gardens perspective and collections issues will continue to be facilitated in appropriate forums and networks, and directly with relevant State agencies.

Table 23.4: Collections activity (development/action) priority chart

	More urgent		Less urgent	
	More important	Less Important	More important	Less Important
Cannot be done or completed within existing budget – major capital or operational item	<ul style="list-style-type: none"> ▪ Database ▪ Labelling/ interpretation 		<ul style="list-style-type: none"> ▪ Increasing resources ▪ Germplasm bank ▪ New conservatory 	<ul style="list-style-type: none"> ▪ Containment facility ▪ Satellite collections
Can be done within existing budget – may often involve attitudinal change	<ul style="list-style-type: none"> ▪ Collections criteria ▪ Key collections ▪ Local/global balance ▪ Focus of collections ▪ Biosecurity/ ERMA²¹ issues ▪ Rationalisation ▪ Curator forums/training ▪ Local distinctiveness ▪ Replacement policy ▪ Raising standards 	<ul style="list-style-type: none"> ▪ Long term planning ▪ Outside collaboration ▪ Labelling needs ▪ Label branding ▪ Images of accessions ▪ Herbarium links 	<ul style="list-style-type: none"> ▪ Horticultural and botanical balance ▪ Donations criteria ▪ Garden linkages ▪ De-accessioning ▪ Community use policy ▪ Educational use ▪ Image storage ▪ Copyright issues 	<ul style="list-style-type: none"> ▪ Significance levels ▪ Collections access ▪ Charges for collections ▪ Label alternatives ▪ Herbarium labels ▪ Landscape photos

²¹ Environmental Risk Management Authority (ERMA) New Zealand.

24. RECREATION AND EVENTS

Explanation:

“Recreation and events” include largely passive activities, such as walking and picnicking, and the holding of cultural events, such as band music.

Objective:

A sympathetic environment for recreation will be provided in the Gardens, with an emphasis on passive recreation, and encouragement and facilitation of appropriate events, where they do not compromise use by others.

The importance of recreation and events

Recreation is an important function of open space in an urban environment and Christchurch is no exception. Well designed cities incorporate open parkland space, dominated by greenery, which includes lawns, trees, annual plants or shrubs. Such spaces enable people to relax, walk and talk, think in an uncluttered environment and enjoy a range of events tailored for the environment. Recreation has a strong community basis and is important for developing people’s identity and sense of home. It is rooted in what people want to do and what they appreciate.

The majority of visitors to the Gardens do not come to be educated or to study plant labels. They come to engage in passive recreation - to walk and talk, lie in the sun, admire flowers and trees and have a pleasant time in attractive surroundings. It is important that in the Gardens there is not only the maintenance of botanically important collections, but also attractive landscapes and the use of plant assemblages that contribute to these landscapes. This includes the Gardens collections of *Rhododendron*, *Magnolia*, colourful autumn trees, winter flowering shrubs and spring bulbs. There is the need to recognise that people want colour, attractive trunks, trees of good form and shrubs with attractive flowers and fruit. They want annual bedding displays, as well as the seasonal attractions of spring and autumn colour.

Botanic gardens also have the potential to offer a wide range of cultural activities, such as the visual arts, theatre / performing arts, music and cinema.

Botanic gardens also provide important social benefits to the community through provision of recreational areas, cultural facilities, venues for public events and sometimes horticultural therapy for the disabled and disadvantaged. They educate people, both formally and informally, about horticulture and landscaping, the value of plants and ‘plantscapes’, the effect that trees and colour make on our immediate surroundings and the vital interactions between people and plants and the communities they form. Botanic gardens raise awareness on issues such as conservation, environmental health and healthy cities, the array of wild species and their associations that is collectively called biodiversity, and how we can plan our own gardens.

A botanic garden is a place for all seasons, where people come for a host of reasons – peace, relaxation, entertainment, recreation, education, wildlife, photography, study of botany and horticulture. Recreational use of botanic gardens is highly varied, reflecting both the varied make up of the community that uses the garden and the particular emphasis of the garden. The groups that use the Gardens include:

- Children, often accompanied by parents, who simply want a place to enjoy.
- Older people and, especially, retirees – as life expectancy increases and some people opt for earlier retirement there are more and more people looking for such a place as the Gardens to visit.
- Those with disabilities – there are a growing number of people in older age groups and a culture in which even severe disabilities do not restrict outdoor activity.
- Changing ethnic groups – the product of globalisation and continued immigration. Increasing and different specific needs and desires for use of places such as the Gardens.
- Tourists – a varied group who may be botanic garden enthusiasts or simply looking for a pleasant place in the sun.
- Students swotting in a relaxed atmosphere.

- Those who choose to live in smaller properties or apartments in the city's central business district and see the gardens as a substitute for the 'home back yard'.

There is a risk, in catering for passive use, that botanic gardens become little more than beautifully manicured public parks²². Unfortunately, the distinction between botanic gardens and public parks is often not well understood. Passive recreation is near one end of a spectrum of visitor activities and, in the planning for the future, the challenge is to facilitate the co-existence of a wide range of activities, in terms of physical activity, noise and client expectations.

Local government, such as city councils, are often the biggest land managers in an urban community. There is sometimes a perception in managing urban green space that any 'spare' areas should be 'used for something' (implying that passive recreation is not a use). But it soon becomes apparent many people like to have some open space simply available for undefined activity – passive recreation.

Considering leisure events, in most cities there is a long history of use of outdoor green spaces in cities for the performing arts and exhibitions. This has increased in recent years with the encouragement of outdoor theatre and music, sculpture, summer concerts and even outdoor cinema. Many green spaces in cities are now sites for regular series of events and festivals, especially during the summer months. The development of semi-permanent and permanent facilities is not unusual.

In botanic gardens, tight control is generally exercised over events within their boundaries. The view is that they should not be regarded simply as event sites that are freely available for all types of events. This leads to the general principle that events in botanic gardens should accord with the overall atmosphere that is wished to be created in them. As an example, there is a tendency to avoid music that is highly amplified and to select performing arts that relate to the theme of botanic gardens and nature. There is a tendency for art exhibitions and cinema to relate to botanic garden themes. Size of audience is another general factor

and many botanic gardens tend towards the hosting of smaller events.

General recreation and events issues for the Gardens

Christchurch's Gardens is no different from any other botanic garden in the general principles and issues that need to be considered. What is experienced elsewhere will eventually find its way here. This is accelerated both by overseas immigration into Christchurch and the perceptions and needs of international visitors, numbers of whom are increasing.

Christchurch, as a city, has important leisure and open space use issues, in which the Gardens and Hagley Park play an important role. The Gardens are both on the edge of the central business district and contiguous with the Cultural Precinct. Some of the more important drivers of what people do in the Gardens are:

- Close proximity to the city centre and so a place people can access at lunch time or walk through on the way to or from work.
- A known tourism destination that is visited by two thirds of visitors to Christchurch.
- Part of the Christchurch Cultural Precinct.
- A lunch stop for tour groups and school groups.
- Proximity to a large public hospital, three secondary schools, two preparatory schools and several language schools.
- Christchurch's major river, the Avon River, flowing around the Gardens.
- Seasonality that brings people in at important change points of the year, for example, spring (daffodils and magnolias) and autumn (leaf colour);
- A place for both children and adults to enjoy – hence the playground.
- A significant increase in the more mature and elderly.
- Significant immigration, including especially first generation Asians.

²² Heywood, V.H. 1987.

Probably the majority of people coming into the Gardens are not seeking an educative experience, but simply want to be in a calming and pleasant place – the ‘chill out’ factor. For many it is a green retreat. Building on this, though, are the botanical displays, and from this visitors can be led to discovery experiences as the world of plants unfolds to those who explore further and further into the Gardens.

Under its Festivals and Events Policy, the Christchurch City Council is committed to supporting a range of events and festivals that:

- Increase the well being of residents.
- Attract economic benefits, through growth in the number and length of stay of visitors.
- Promote the establishment of industry related business activity and employment opportunities for residents.
- Maintain Christchurch’s position as a leader in events.
- The outcomes of this policy are to:
 - Meet the needs of residents and visitors for enjoyment, sport, recreation, art and culture.
 - Promote healthy lifestyles of residents through participation in events.
 - Provide a great place to live where residents are provided with both free and paid entertainment of a standard that meets or exceeds their expectations.
 - Assist residents to participate in community life and enhance their sense of belonging and identity.
 - Improve residents’ and visitors’ understanding of the cultural diversity of the city.
 - Enhance the unique identity of the city, both nationally and internationally.
 - Grow business in the city in related industries.
 - Provide employment opportunities for technical, artistic and sporting residents.

- Provide related Christchurch businesses with the opportunity to expand their products and/or services into other parts of New Zealand and internationally.
- Increase the number and length of stay of visitors to the city.
- Improve the understanding of, and respect for, Christchurch, both nationally and internationally.
- Maintain a vibrant and dynamic events calendar, which includes ‘cutting edge’ events.

The City Council has a wide range of functions within these outcomes, both as a provider and a decider. It directly organises and funds festivals and events, provides assistance to outside organisers, advocates and evaluates events and festivals, advises and co-ordinates, promotes and is an encourager of spontaneity, innovation and fun through events and festivals.

Such activities are provided to some degree in the Gardens, but only where they do not jeopardise or run counter to the goals and objectives of the Gardens overall or to other purposes of the Gardens. The Gardens is a multi-purpose facility that needs to balance one use against another. While not necessarily becoming all things to all people, no one should feel disadvantaged or disenfranchised by what is permitted to take place in the Gardens.

One of the negative aspects of passive recreation is that, although this may for many people be a predominant activity, other users may well want more and find this sort of activity ‘boring’. The Gardens does need to be ‘for all seasons and tastes’ and accommodate a wide range of client needs. Passive recreation is an important use of the Gardens, but is only one of those uses.

Public perceptions

Entertainment and events within the Gardens have been commented on in a number of public submissions received in 2004. None were negative and innovative suggestions were made, one of the most frequent being for evening use of the Gardens, including for the installation of tree lighting. Also, more integration of performing arts and music with the Gardens was suggested, and

for there to be a variety of events to encourage people to return. Comments indicated that the present standard of events was seen to be acceptable. However, there was a wish for more facilities, such as Band Rotunda seating, additional and better toilets throughout the Gardens, and for several sites with shelters and tables. Submissions also suggested that there are a number of ways in which visitor entertainment might be improved, provided it is compatible with the cultural, present recreation and passive values of the Gardens.

Art work and sculpture includes not only permanent features, but also temporary displays and exhibitions. Sixty submissions on art work in the Gardens were received during the submission process. Most of these responses were supportive of art in the Gardens, with a common thread being concern that there be quality and appropriateness of art work and sculpture, although there were differing opinions on what was seen to be appropriate. A commonly expressed principle was that art work and sculpture should support or enhance the existing character of the Gardens and its collections and that temporary art was preferred to permanent art.

With respect to interactive experiences in the Gardens, most public responses indicated that, while there should be interaction with plant collections, most people did not want a 'Disney-like' approach and suggested that more intensively interactive features are better catered for by places such as the Canterbury Museum and Science Alive.

Special issues

What events are appropriate to the Botanic Gardens?

A number of questions can be asked that help determine both the appropriateness of events proposed for the Gardens and their complexity:

- Does the event fit with the ethos and direction for the Gardens?
- Are there constraints determined by the needs and expectations of other users?

- What resources are required of the City Council?
- What are the hidden costs, such as cleaning up after events or from opportunities lost because space the space has been taken?
- Is Garden branding required or expected?
- Is the event public or private?
- What are the security and control issues?
- What City Council policy and by-law requirements need to be met?
- Are there legal issues concerning safety, discrimination and permits?
- What benefits will accrue to the Gardens?
- Is the event a one-off or regular one, expected to occur again?
- Is there a need for a rest period between events at the same site?

The link to city events is important as, increasingly, there is pressure for green open space to be used for festivals and events often of a cultural nature, and such events are usually tied into a wider programme. The Council's Events Strategy describes Christchurch as "the city of festivals, events and fun" and aims to²³:

1. Create a vision/direction for the City's events industry.
2. Identify goals and objectives.
3. Identify potential partnerships between key stakeholders.
4. Clarify the Council's future roles within the events industry.

Should the Council's Events Production Team and Botanical Services Operations Team more rigorously define the relationship between 'events' and the expectations for the Gardens and

²³ <http://www.ccc.govt.nz/strategies/eventsstrategy/>

its customers, including the consideration of specific sites and the appropriateness of particular events? How are events that require an entry fee handled for the Gardens, as well as private events that are not open to the public? In the case of the first of these, the Gardens may, from time to time, host events, such as plays and concerts, and exhibitions such as sculpture and other art. Many such events are currently well catered for in the Entertainment Zone in North Hagley Park and, especially for larger events, organisers should be directed there.

Private events are not encouraged, with the exception of photography for special occasions, such as for graduation and weddings photos. Rules are already in place for commercial photography, video and movie shoots, and, for weddings, several parts of the Gardens are designated as available sites. Thought needs to be given to whether or not other sites should be made available, especially if demand significantly increases. Currently, other private functions are assessed on a case-by-case basis, but, as a general principle, private events will only be allowed if they are outside normal opening hours or do not significantly impinge on the use of the Gardens by others.

The community health value of passive recreation

Greenery in the form of a garden has been shown to reduce stress in health care situations²⁴. Research into health psychology and behavioural medicine has demonstrated that there need not be anything magical about the processes by which gardens in healthcare facilities are capable of reducing stress and improving patient health. Poor urban design and lack of green spaces has detrimental health effects, such as higher anxiety, delirium, increased need for pain medication, elevated blood pressure and sleeplessness.

A concept that is currently being developed is that of the restorative garden²⁵. This links human health and the vitality of the natural environment in a mutually beneficial partnership. Integrating principles of ecological design and medical research on human welfare, restorative

gardens are designed to meet the physical, psychological, and social needs of patients and their caregivers. The health benefits of these gardens, however, extend beyond the garden walls to include the wider institution, surrounding communities and the whole living landscape. Restorative gardens can range in scale and complexity from a collection of indoor plants in containers to include roof gardens and outdoor landscapes. Restorative gardens attend the needs of human, ecological and public health.

The calming aspect of the Gardens is significant given several factors:

- Hagley Park and the Gardens is collectively a well loved and well used central city resource.
- The Gardens are tree dominated – a factor in their use all year round, as they provide shelter and comfort.
- The immediate neighbour to the south is one of the largest hospital complexes in New Zealand.

Therefore, design and selection of plants needs to reflect this position and usage; for example, by providing a calming and soothing atmosphere, a celebration of colour and form and a good array of places within the Garden where people can walk unimpeded, meditate, ‘chill out’ and feel at home.

The position of the Gardens adjacent to Christchurch Hospital is highly significant. There is, at the present time, no organic and seamless connection between the hospital grounds and the Gardens area. Wheelchair access to the Gardens and the Hagley Park woodlands is impracticable without going out onto Rolleston Avenue and back in the street entrance to the Gardens. The gravel surface of the pathway along the south bank of the Avon River from the hospital grounds to the Daffodil Woodland makes wheelchair or disability access difficult. Seamless management would facilitate a pleasant, informal and intimate experience among beautiful and restful plants for hospital patients and visitors.

Areas/sites for performance events

The Gardens provide a high profile location, readily accessible and central to the city, where appropriate performance events can be held.

²⁴ http://www.eurekalert.org/pub_releases/2003-11/taught112103.php;

<http://www.sciencedaily.com/releases/2003/11/031124071045.htm>

²⁵ <http://www.meristem.org/>

There is no need for the Gardens to be used for very large events – these are well taken care of in the North Hagley Park Entertainment Zone. Performance events will generally be small music ensembles, readings, ballet, orchestras / bands and live theatre. All of these are periodically hosted in the Gardens. Where should such events be allowed? The following list is not all inclusive:

- Murray Aynsley Lawn (actually in Hagley Park, but managed as part of the Gardens).
- Bandsmen’s Memorial Rotunda (also in Hagley Park).
- Archery Lawn (should only be for occasional ‘special’ events).
- Cockayne Garden (frequently used for private events, but also suitable for smaller ‘intimate’ public events).
- Conservatory complex (for smaller events - has been used occasionally for private functions).

The Gardens management team must have final say on whatever events are held²⁶. Botanic gardens, though, have to be available for a wide range of activities and public expectations, and landscapes can be engineered to provide effective noise and activity barriers over short distances. However, it is also desirable to determine what activities are favoured by the public, in which areas, and to ensure that the demand for noise and disturbance free areas is met.

To ensure activity separation is achieved, management tools include:

- Limitation of certain activities, for example, concerts and weddings, to particular sites.
- A policy of cleaning up and restoration after use being enforced.
- Minimising management traffic and deliveries within the Gardens, especially during peak public hours.

- Minimising or banning public traffic access within the Gardens.
- Use of screen plantings, for example, dense shrubbery and hedges.
- Identification and aggregation of high use areas, such as eating places, and information briefings for visitors.
- Use of directional amplifying speakers for guided groups.
- Limitation on use of amplifiers and loudspeakers for events such as concerts, and upper limits for noise generation.
- Zoning of activities, such as energetic ball games, to sites where they are appropriate.
- Control of public activities, including over the frequency, nature and duration of these to ensure that the Gardens do not just become another large booking venue for events.

Developing a seasonal approach

One of the features of Christchurch is that it has a strong seasonal climate. This is perhaps more often recognised by those from outside the city and the Canterbury Region than those living in it. Seasonality provides a framework for celebrating different times of the year as part of an annual cycle. Throughout history people have celebrated such things as the return of spring, the equinox, mid-summer and mid-winter, and this helps create a socio-ecological environment rooted in history and culture.

If the Gardens is to be truly a celebration of plant diversity and the relationship that people have to plants, than there is ample scope for botanical, conservation and heritage messages to be reinforced through regular recognition of special days and seasons. Given the seasonal nature of Canterbury, it makes sense to ground this, first of all, in a recognition and celebration of seasons and the running of events that relate to the particular time of year they are held.

Table 24.1 below sets out anniversary days, some of which are global in nature while others are more local. The four seasonal beginnings are in

²⁶ Currently the Botanical Services Operations Team and the Transport and Greenspace Unit.

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bold type and more significant days/weeks for the Gardens are underlined.

Table 24.1: Anniversary days relevant to the Gardens

Date	Anniversary
Between 21 January-19 February	Chinese New Year
2 February	World Wetland Day
1 March	First day of Autumn
22 March	World Water Day
23 March	World Meteorological Day
Early April	Canterbury Conservation Day
22 April	Earth Day
1 June	First day of Winter
5 June	World Environment Day
	Arbor Day
New Moon during June	Maori New Year
9 July	Founding of the Gardens
First full week in August	Conservation Week
Last Friday in August	Daffodil Day (for cancer research)
1 September	First day of Spring
Third Tuesday in September	Clean Up The World
1 October	World Vegetarian Day
5 October	World Habitat Day
16 October	World Food Day
Third week in October	Heritage Week
	World Rainforest Day
Last Friday in November	International Buy Nothing Day
1 December	First day of Summer

If seasonal change is taken to be the foundation for a celebratory cycle throughout the year, then effort should be made to link days of celebration and recognition to those seasons. In some instances, days may be close enough to be celebrated together.

A wide range of activities can be considered in conjunction with special days and these should be planned on a twelve month cycle. For example:

- Special walks for the public.
- Static displays.
- Appropriate art work.
- Live performance and music appropriate to the season/celebration.
- Single lectures and lecture series.
- Picnics, and special selections of food at food outlets in the Gardens.

Advertising and promotion is important. A calendar or brochure outlining special dates is a way of keeping people in touch with what is coming up, especially if the event is a regular yearly one that has a particular date. Missouri Botanical Garden, as an example, features special dates on the appropriate section of its highly pictorial yearly calendar.

Catering for children – playground or garden?

One special feature of the Gardens that has been frequently debated is the provision of a playground. This mainly centres on two issues – if there should be a playground in the Gardens at all, and the precise nature of the playground. The current playground has high use by young children, especially in the summer. In making decisions on the playground the following points need to be considered:

Is it a way of establishing a relationship between people and the Gardens at a young age?

- Should the play area be more ‘botanic’ in nature and can it be changed to reflect this?
- The playground brings into the Gardens parents with differing priorities and motives from that of children.
- Should the playground activities be different from the range of activities in most parks so as to fit with the different feel and direction of the Gardens?
- What provision is there for handicapped people?²⁷.

There is a strong initiative among botanic gardens, generally, to provide themed children’s gardens. This is a development that warrants strong consideration as a new facility, perhaps using the theme of water, but presenting it in a way that will appeal to a range of children.

²⁷ In 2006 the Variety Club sponsored New Zealand’s first handicapped swing in New Zealand as a Gardens playground development.

A recreation and events strategy

Goal 6: *Passive recreation is recognised and valued as a major use of the Gardens that contributes significantly to individual and social well being and health.*

Action 6.1: While acknowledging that botanical collections have priority, there will be deliberate planning for and recognition of the overall values of passive recreation and the need for areas of the Gardens that are free of significant noise and disturbance.

Action 6.2: Promotion of the role of plants in community health by providing landscapes, and plant colour and form that are compatible with passive recreation, and an array of places within the Gardens where people can experience peace and tranquillity.

Action 6.3: Seamless management will be sought across the boundary between Christchurch Public Hospital and the Gardens, with enhancement of access to the Gardens, including a link bridge between the hospital grounds and the Armstrong Lawn area of the Gardens.

Goal 7: *The use of the Gardens for appropriate events will be facilitated within a framework that requires assessment of each event’s value for the Gardens and the community, ensures high standards and minimises conflict with other users.*

Action 7.1: Applications for events will be assessed in a transparent process, within a time frame that allows realistic decision making, to determine appropriateness, scale, costs and operational implications, and to identify and mitigate

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issues that need to be addressed.

Action 7.2: The Gardens management team will approve all events and botanic garden programmes, generated internally or externally, and will carry out periodic performance audits on these.

Action 7.3: Rather than risk celebration and event overload, there will be a selection of well run, enjoyable and meaningful events that are professionally run to a high standard and which benefit the Gardens.

Goal 8: *Core infrastructure and facilities to support recreation and events will be developed and maintained, recognising the costs that may accrue, especially for externally generated events.*

Action 8.1: Essential facilities, such as toilets and shelter needed by visitors, will be provided at readily locatable sites and will be maintained to a high standard.

Action 8.2: There is need for clearly identified sites for a range of events and provision at these sites of permanent services, especially at sites where larger events may be held.

Goal 9: *Facilities and events that cater for a wide range of ages, ethnicities and socio-economic groups, including the disadvantaged, will be supported and developed in the Gardens.*

Action 9.1: Recognising the seasonal nature of Canterbury, a cycle of events, based on the recognition and celebration of the different seasons, will be held.

Action 9.2: Will seek to ensure that events in the Gardens are widely advertised to appropriate audiences, both through Gardens and City Council media and externally.

Action 9.3: The specific and differing needs for a wide range of users, from the young to the old and from different ethnic groups, will be recognised in all Gardens planning, especially for recreation and events.

Action 9.4: The role of the existing Gardens playground, which will be enhanced, is recognised and consideration will be given to associated development of a children's garden.

Action 9.5: Options will be investigated for development of a a sensory garden, which should be located near the hospital, but linked with other facilities in the Gardens, including the children's playground and related plant collections.

Action 9.6: All reasonable steps will be taken to ensure that the Gardens collections and facilities, and events hosted in the Gardens, are accessible to disabled and disadvantaged members of the community.

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Table 24.2: Recreation and events activity (development /action) priority chart

	More urgent		Less urgent	
	More important	Less Important	More important	Less Important
Cannot be done or completed within existing budget – major capital or operational item		<ul style="list-style-type: none"> ▪ Event advertising 	<ul style="list-style-type: none"> ▪ Gardens’ playground enhancement ▪ Children’s garden ▪ Sensory garden ▪ Disabled/ disadvantaged access 	<ul style="list-style-type: none"> ▪ Database ▪ Labelling/ interpretation
Can be done within existing budget – may often involve attitudinal change	<ul style="list-style-type: none"> ▪ Event approval refined 		<ul style="list-style-type: none"> ▪ Promotion of passive recreation ▪ Seamless hospital / Gardens interface ▪ Toilet and facilities review ▪ Event sites review 	

25. LAYOUT, LANDSCAPE AND CIRCULATION

Explanation:

“Layout, landscape and circulation” is about the physical structure and form of the Gardens and how it can be accessed by the public.

Objective:

The Gardens will be an exemplar of high quality landscape design.

A clear hierarchy of footpath systems and spaces will provide staff and visitors with access to all plant collections and facilities.

The importance of landscape design and circulation

Landscape design

High quality landscape design has a major influence on the way people experience and use any site whether it is a public park, private garden or botanic garden. The overall layout of the site should be clearly legible through the arrangement of spaces and path systems that cross these spaces. Consideration needs to be given to scale, character, size and variety of spaces that will provide visitors with a range of spatial experiences. Large scale spaces can be dynamic and sometimes intimidating, while small areas can provide a degree of comfort and security. The manner in which spaces are enclosed or separated can also determine that spatial experience.

Open space character

In a botanic garden these spatial experiences are created by the use of a range of different plants and their groupings. For example, the random placing of mature trees set in a large open lawn area provide a very different experience to that of a small area of lawn surrounded by dense colourful shrubbery. In the open lawn area, the space is very public and dynamic, while a smaller enclosed space can provide intimacy, shelter and security.

The relationship between, and linking of, spaces can be critical in encouraging people to move

through and around a site. Through the manipulation of form and space, using plant material, structures and a range of surfaces, the designer can present the visitor with yet another combination of experiences that encourage them to move on. The feeling of intrigue, mystery or surprise can be enjoyed by creating opportunities for a glimpsed view or a distant vista.

Path network

Paths can be used to direct visitors through or around spaces and structures. A wide, evenly graded path allows for people to stroll and promenade slowly through the Gardens, enjoying each others company and the ambience of the space. Narrow paths with a rougher surface, winding through thick vegetation give the visitor a sense of adventure - to explore and discover.

In general, paths are required to direct people around the Gardens and to enable the visitor to access plant collections and facilities. Another function of a path network is to define spaces by creating boundaries for planting.

Paths are also necessary for the general maintenance of the Gardens and are often used by light and heavy vehicles. It is important to develop a hierarchy in the path network that allows for the use of paths for specific activities. The design and use of a range of surface materials plays an important role in developing this hierarchy.

Natural features

A well considered landscape layout will acknowledge and incorporate the natural features of a site. A major feature, such as a river or stream, may be the focal element in the design. Subtle changes of level such as river terraces can be enhanced so that they become more legible to visitors and the importance of the landform recognised. Variations in soil type and microclimate become evident through the growth of appropriate plant collections in those locations.

Cultural/heritage elements

Cultural and heritage elements, including natural and man made features are identified and incorporated into the overall landscape plan. The significance of these elements needs to be

assessed and determined by the community before they are retained or removed. For example, it could be debated whether memorial plantings are still appropriate in the Gardens.

Built forms

Facilities such as display houses, information centre, toilets, administration buildings, café, restaurant, plant nursery and maintenance buildings, are included in the overall landscape plan. How these structures function and the services they provide to staff and visitors is relevant to the overall layout of the Gardens. The function and purpose of some of these structures will change and any new plan will need to accommodate these changes. Placement of new structures has to be weighed up against a number of factors, such as: does the facility need to be provided in the Gardens, does it enhance the visitors experience, does it assist in the efficient administration of the Gardens and does it compromise other activities and services? The plan needs to be flexible to accommodate change, especially when old facilities need replacing.

General issues with the existing layout of the Gardens

The Gardens has never had an overall design plan to guide its development. The existing layout is ad hoc in nature. Because of this overall lack of planning and design, the Gardens lacks cohesion and there is no clear vision for their visual and spatial structure.

An extensive assessment has been undertaken which has identified a range of issues that need to be considered:

1. An ageing tree problem. Many trees planted in the late nineteenth century are showing signs of senility and decline, leading to issues of health and safety. Eventually these trees will need to be removed. The question then arises - what are they to be replaced with?
2. Old and inadequate facilities, such as the staff administration area, toilet blocks and the children's paddling pool are also in decline and need replacing. What type of facility is required and where should it be placed?

3. Access to many parts of the Gardens is unclear and confusing to many visitors. A review of the footpath network has identified the need to realign and create a more legible path system.
4. Re-development of the adjoining Canterbury Museum and its relationship to the Gardens will have an impact on the way visitors will use these two major tourist attractions in Christchurch.
5. The existing plant collections are fragmented, with some collections unavailable for visitors to view. Consolidation and interpretation of these collections and new collections will provide the visitor with a more focused botanical experience.

It is evident that the layout of the Gardens is in response to various historic influences and several phases of Gardens development such as:

- Colonial settlement
- Scientific research
- Aesthetic trends

It is believed that the true foundations of the Gardens lie in the contributions and efforts made by Enoch Barker, John and James Armstrong, Ambrose Taylor and James Young. Successive curators have contributed further to the Gardens development. What is evident is the lack of an overall vision for the Gardens in the form of an overall designed plan. Edgar Taylor's 1958 plan is primarily a draughting exercise to show a map of the Gardens at that time.

Colonial settlement and scientific trends

In the mid nineteenth century, a primary purpose of the original Government Domain was as a repository for plant material brought into the country by the Acclimatisation Society. Nurseries were established to propagate plant material, namely English trees, such as oak, beech, hornbeam and ash, to be planted in the avenues and parks of the newly established town of Christchurch. No consideration would have been given to the layout of paths and placement of trees. The randomness and collection of many established trees in the Gardens is evidence of that. The Water Garden has evolved from

previous shingle pits. Excavated material was taken from these sites and used to build the roads and avenues of Christchurch.

Aesthetic trends

The introduction of massed shrub vegetation, favoured by the Victorian garden makers, would have been introduced by Ambrose Taylor. Plant collecting from around the world, and the introduction of new species, was an avid pastime for the Victorian plant enthusiasts and these ideas were quickly adopted by the new colonists in New Zealand.

The majestic sequoias planted on the north side of the Archery Lawn were raised from seed in 1873, but it is unclear when they were planted. Up until 1889, the Lawn was used by the local archery club and one might speculate that the sequoias were planted to provide welcome shade to the participating archers and croquet players who occupied the western end of the Lawn. The Archery Lawn is an iconic area within the Gardens. It provides a defined, linear open space which leads people into the centre of the Gardens. It is located at the narrowest point between the boundary with Christ's College and the Avon River. It is unclear whether this space was consciously designed to draw visitors into the Gardens or if it was merely the best available flat area of land at the time that could be used for recreational pursuits. The latter was probably the case, as there is no clear visual connection from the Armstrong Lawn, known originally as the 'front lawn' through to the Archery Lawn. A remnant sand hill, now known as the Pine Mound, forms a physical and visual barrier between these two spaces.

During the early twentieth century, these two iconic spaces (the Armstrong Lawn and the Archery Lawn) were favoured by the citizens of Christchurch. People took pleasure in seeing the formal bedding areas and the wide footpaths afforded space to promenade, socialize and experience the long vistas. James Young responded to the demands of Christchurch society by creating a Garden of mown lawns edged with colourful bedding plants and interspersed with mature trees. It was the fashionable style of Edwardian England, which was inherited in Christchurch and maintained today.

The Armstrong Lawn and the Archery Lawn provide a necessary function of drawing visitors into the Gardens. From the western end of the Archery Lawn, the layout and circulation pattern of the Gardens is ad hoc and confusing, particularly to first time and many return visitors.

Analysis

Tree collection – life expectancy

As well as planning and relocating new buildings, consideration must be given to the relocation and replanting of trees. Many of the introduced exotic trees are showing signs of senility and decay. A comprehensive study in July 2004, by the City arborist, of the trees in the Gardens has identified every tree, its age, condition, health and life expectancy. A further assessment of the trees looks at their rarity (as classified in the IUCN Red List²⁸), ecological value and conservation value. All survey and analysis work has been prepared in CAD (computer aided design) format so that it can be overlaid and used as a basis for planning and design work.

Spatial analysis

A spatial analysis shows that a semi-closed to closed canopy woodland is the dominant character of the Gardens, with lawn areas separated by massed vegetation. Often specific areas are poorly defined. Many visitors can identify the Armstrong and Archery Lawns, but are unclear about other spaces in the Gardens, such as the Observatory Lawn or Potts Lawn. These poorly defined areas lead to confusion and disorientation for most visitors. Links between the different plant collections are unclear and it is difficult to achieve a sense of progression from one collection to the next. From the historical knowledge of the Gardens, it is known that development has been ad hoc and some collections are not always in the best place for viewing. The network of paths tends to exacerbate this confusion and there are areas of the Gardens which are under visited

²⁸ The World Conservation Union (IUCN) Red List catalogues and highlights those taxa that are facing a higher risk of global extinction.

CHRISTCHURCH BOTANIC GARDENS MANAGEMENT PLAN (AUGUST 2007)

- PART IV ISSUES AND ACTION PLAN -

25. Layout, Landscape and Circulation

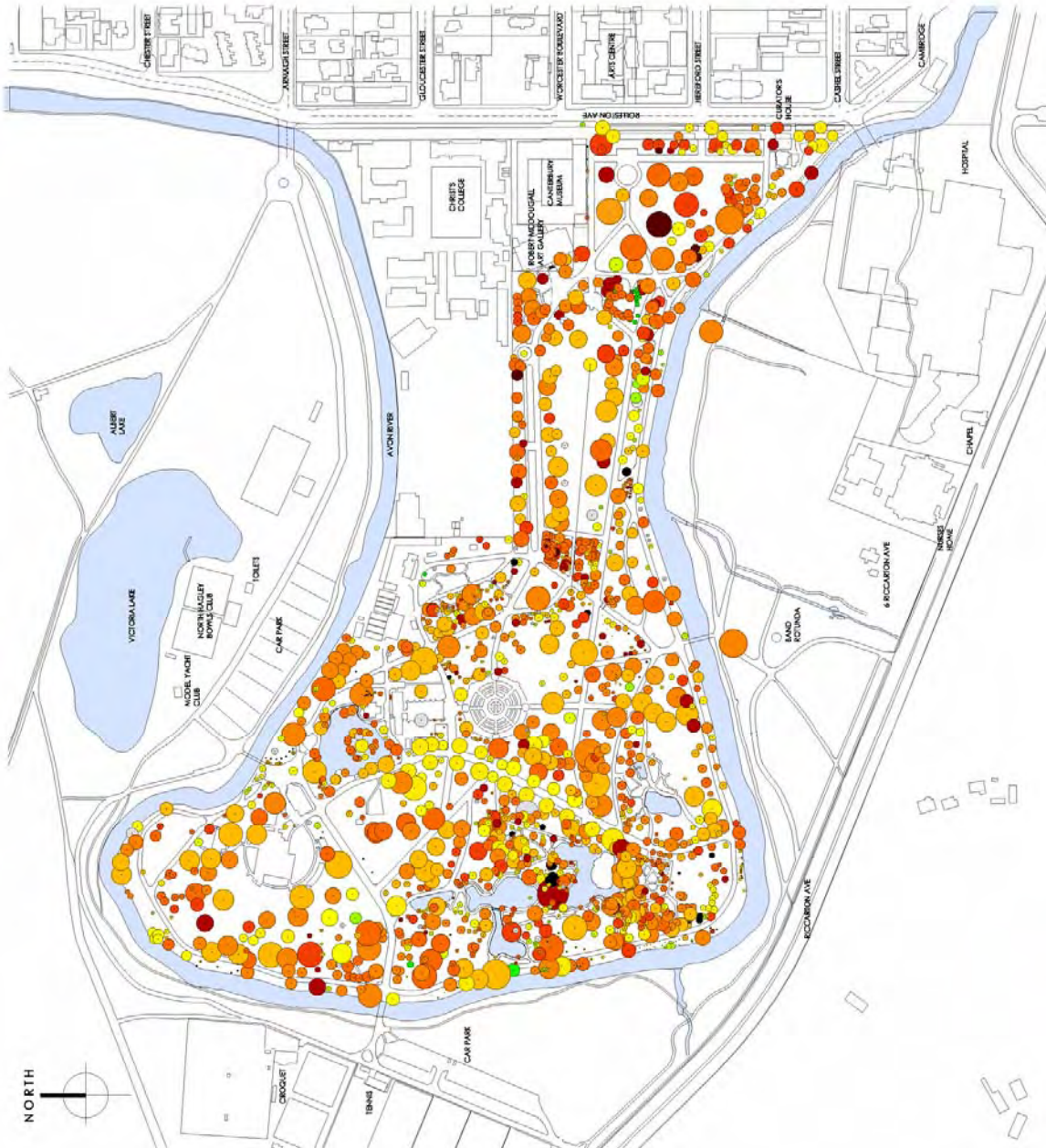


08c

Figure 25.1:
Tree life expectancy

LIFE EXPECTANCY
(base year 2003)

- 0 years
- 1 year
- 5 years
- 10 years
- 15 years
- 20 years
- 25 years
- 30 years
- 40 years
- 50 years
- 60 years
- 70 years
- 80 years
- 90 years
- 100 years



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CHRISTCHURCH BOTANIC GARDENS TREE COLLECTION - LIFE EXPECTANCY

CHRISTCHURCH BOTANIC GARDENS TREE COLLECTION - LIFE EXPECTANCY



There is the possibility to develop the Gardens as an internationally recognized botanic garden. Knowing that trees will need replacing over time, there is an opportunity to:

1. Propagate new and appropriate species that will have the height and form necessary for the site.
2. Create a new framework using new and existing plantings.
3. Create well defined spaces and display all plant collections to their best.
4. Utilise all areas of the Gardens and make them accessible both physically and visually.
5. Cull out clutter and unnecessary material.
6. Provide a layout for an automated irrigation system.

Iconic collections and spaces

Over the years the development and species choice in the Gardens was sporadic, and very much influenced by the specific interests of head gardeners or curators at the time. These cumulative influences are now embodied in iconic spaces such as the Archery and Armstrong Lawns, the Daffodil Woodland, the Cockayne Garden and the Rose Garden.

The Gardens as dynamic and design considerations for change

In time, the character of the Gardens will change as trees die or are removed. The challenge is to protect the character of some of these 'iconic' spaces, such as the Archery Lawn, rather than the species.

The five major issues that will lead to changes in the Gardens layout are:

- Ageing tree population.
- Old and inadequate facilities for public and staff.
- Confusing and illegible path network.

- Canterbury Museum redevelopment.
- Fragmented plant collections.

To manage these changes it will be necessary to develop a clear vision and design which responds to the underlying landform, iconic areas and dominant vegetation character. A landscape plan will assist to achieve accessibility, coherence and legibility for the whole site and identify areas for future development.

In so doing it will be necessary to consider:

1. Rather than replacing the Albert Oak, for example, the legacy of this tree may not continue in the Gardens but its progeny could be distributed far and wide in the form of seedlings to commemorate the 150th Anniversary of the Gardens.
2. How much are memorial structures valued by the community and would it be inappropriate to remove or relocate a structure if it compromises improved access and circulation in the Gardens?
3. How important is the footpath layout which has not been logically planned, but rather evolved in response to need as a succession of desire lines and maintenance vehicle tracks?
4. The relationship with the redeveloped Canterbury Museum offers opportunities to link living botanical collections with fossils and natural history, by providing an entry into the Gardens through the Robert McDougall building, which is to become part of the Museum.
5. How important is it to retain certain plant collections in an area of the Gardens just because it was decided by the curator of that time. Many species such as oak, azalea, rhododendron, magnolia and native species are randomly planted throughout the Gardens, resulting in confusing and fragmented displays.

26. CONSERVATION

Explanation:

“Conservation” means ensuring that a range of plants, especially those that are threatened in some way in their natural environment, are protected in collections.

Objective:

The Gardens will contribute to the conservation of global and regional plant diversity through collections and genetic banks, education and awareness, and practical conservation action, while also setting high standards in biosecurity, energy and waste conservation, wildlife habitat maintenance and environmental health.

The importance of conservation

World-wide, wild plants and their habitats are under increasing threat and many are in decline. Clearly, preservation and management of wild habitats, or ones that are partly modified, is preferable to preservation in an unnatural environment, such as a garden or a zoo. Yet, the scale of natural habitat modification and loss, especially in urban environments, is such that the options for a purely *in situ* (that is, on-site using reserves) approach to conserving species and their habitats may not exist. Some plant species require temporary or permanent use of a botanic gardens (that is, *ex situ* or off-site) as part of their population stabilisation or as part of a recovery programme.

Alongside the plight of wild plants is the disappearance of domesticated plants and cultivars. Of particular concern is the irretrievable loss of heritage plants, which are species and cultivars that have a long association with human society. These include a large array of plants that were brought to New Zealand by the early colonists, Maori, Europeans and others. Many of these have been superseded by modern cultivars, but may possess qualities such as high levels of important chemical compounds, taste or harvesting features that are diminished in more recent breeds.

There cannot be over-emphasis of the importance of conservation in role of botanic gardens. Of all major environmental problems facing the planet – pollution, global warming, depletion of the ozone layer, land degradation, loss of biodiversity – only the last is irreversible²⁹. There is no second chance once plant species are totally extinct, and the only way to conserve biological diversity is to ensure that it stays alive. The conservation role of botanic gardens, both globally and locally, is broad, but can be summarised as:

- Stopping the loss of plant species and their genetic diversity.
- Helping prevent further degradation of natural environments.
- Raising public understanding of the value of plant diversity and the threats it faces.
- Implementation, especially through partnerships, of practical action for the benefit and improvement of the natural environment.
- Promoting sustainable use of natural resources for present and future generations.

Achieving this requires partnerships with a wide range of organisations including government agencies, community groups, research organisations, environmental groups and key individuals. Because botanic gardens have the capability to promote education programmes, exhibitions, festivals and science programmes they can play a more important role in conservation of nature than is often realised. They can be a ‘shop front’ for conservation within the city environment. Overall, botanic gardens can, and should, play a vital role in helping ensure the continued well being of the world’s remaining plant life³⁰.

In situ and *ex situ* approaches to integrated conservation of biodiversity are complementary. What is important is that, while there are principles that can be applied to conservation

²⁹ Wilson (1992), quoted in Hopper, S. 1997. Future plant conservation challenges. In: Touchell and K.W. Dixon (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGCI. Pp. 11-20.

³⁰ Hopper 1997.

action, detailed prescriptions are case specific. Where does the Gardens fit into an integrated conservation strategy? Growing plants that have conservation value may be seen simply as having educational and awareness value, but other reasons for growing plants of conservation interest are to:

- Maintain a stock of plants under controlled conditions as an insurance against loss in the wild.
- Provide a source of material for propagation and later re-establishment in the wild.
- Store genetically valuable material under controlled conditions.
- Provide well documented plant material for research.
- Allow the study of environmental conditions that most suit target species.

Furthermore, there are opportunities for botanic gardens to play a lead role in facilitating conservation action. Examples include hosting forums and workshops, being a neutral partner but committed advocate for conservation, bringing together academic and management agencies along with community groups, and being a shop-front for conservation generally. The bottom line is that the botanic gardens must be not only preaching good environmental management, but also taking a lead in doing it.

In addition to the expected role involving threatened species and vegetation or habitat restoration, there is much that botanic gardens can achieve in terms of environmentally sensitive operations that help reduce human pressures on the urban environment. This is especially in the areas of waste reduction, sensitive horticultural practices and energy conservation. Botanic Gardens should be leading by example, for instance, in adopting Green Globe and Natural Step policies for conservation of their own resources.

General issues for the Gardens

Increasingly urbanised life styles and growing tourism means that the Gardens will receive

increasing numbers of visitors. As an example, it is estimated that tourist numbers to Christchurch will double every eight years³¹. On this basis, and allowing for predicted population growth of Greater Christchurch, the annual number of visitor might be expected to reach two million by 2015. As the Gardens provide a major part of people's regular contact with biodiversity, it is that they have "enjoyable visitor experiences that change value systems towards conservation"³².

The Gardens also has the opportunity to visibly support, and tell people about, obligations arising from national strategies, international conventions and agreements that promote conservation. These include:

- New Zealand Biodiversity Strategy – an overall umbrella approach to the conservation and wise use of species of animals and plants occurring in New Zealand.
- Convention on Biological Diversity – through *ex situ* conservation, research, training, public awareness of biodiversity issues, equitable sharing of plant resources and promotion of sustainable use.
- Convention on Climate Change – promotion of education, training and public awareness (relevant to note that the Gardens has a climate station).
- Ramsar Convention (wetlands) – cultivation and conservation of threatened and rare aquatic and wetland plants.
- World Heritage Convention – supporting the network of listed sites through research, collections, horticultural and educational programmes.
- CITES (trade) – codes of practice observed, and education and awareness programmes.

³¹ Brockerhoff, E., Given, D. R., Ecroyd, C., Palmer, J., Bordon, R., Stovold, T., Hargreaves, C., Hampton, J., Mackay, M. and P. Blaschke, P. 2004: *Biodiversity: Conserving Threatened Introduced Species*. Report for MAF Policy; Operational Research Project FRM 228.

³² Hopper 1997.

At a local level, Christchurch has a draft Biodiversity Strategy that outlines a role for the Gardens. Voluntary guidelines and agreements, such as those developed by Botanic Gardens Conservation International (to which the Gardens belongs), can be promoted. The Gardens should show leadership in such areas of activity as biosecurity, threatened species promotion (growing, recovery operations, replanting), and in providing wildlife habitat for the indigenous biodiversity of Christchurch. This means taking account of New Zealand biosecurity regulations as well as the principles developed by the Global Invasive Species Programme (GISP). A somewhat neglected aspect of conservation that is also appropriate to the Garden is the conservation of non-New Zealand exotic plants of conservation value, such as many heritage crops and fruit trees as well as rare cultivars.

The Gardens' conservation role includes education and advocacy, liaison with groups that are engaged in species recovery programmes and ecosystem restoration, dealing with specimen importation issues, enhancing wildlife habitat in the Gardens and adopting nature friendly practices. Some of these functions are already recognised and implemented, while others will require new practices to be developed and, in some instances, new approaches.

Public perceptions

There have been very few comments by the public, either through submissions or surveys, which deal with the issue of conservation. This probably demonstrates that, for the general public of Christchurch, conservation is not perceived as an important function, although, in many countries overseas, it is a major, if not the major, role. There is a general consensus, though, that education is important, and submissions on this do include reference to, and approval for, the following areas of conservation action:

- Development of a partnered germplasm bank³³.

³³ Germplasm includes all live biological (in this instance, plant) material that is capable of being used to produce new plants, and includes seeds, tubers, tissue culture samples and viable DNA; a bank is a place where such material is stored for future use.

- Hazardous and weedy plants.
- Rare and threatened plant displays and education.
- Information sources for native plants, including ecological restoration.
- Education on local biodiversity objectives.
- Conservation information sharing.

Specific issues

Target species for conservation collections

What are the target conservation species and plant groups for a botanic garden to grow and study? Some general priorities are:

- Wild species that are rare and endangered at a regional scale.
- Culturally significant species and cultivars.
- Species important for the restoration of indigenous ecosystems and habitats.
- Germplasm stocks of threatened and culturally important species.
- Taxonomically isolated species.
- Semi-domesticated plants and cultivars.

There will be visitor expectations about target species and many people may expect to see particular species of conservation interest displayed, such as kaka beak (*Clianthus puniceus*) and pohutukawa (*Metrosideros tomentosa*).

However, there are many other plants, especially from the eastern South Island, that should be target species. These include:

- *Carmichaelia muritai* (is a fascinating story of discovery of what is one of the world's rarest tree brooms).
- *Hebe armstrongii* (attractive garden plant rediscovered in the wild).

- *Leptinella nana* (one of the world's rarest and smallest daisies, but with potential as a lawn plant).
- *Myosotidium hortensia* (the world's largest forget-me-not and a localised Chatham Islands' plant).
- *Muehlenbeckia astonii* (an endangered shrub that is like a giant wire mattress).
- *Olearia hectori* and *Olearia lineata* (two regional species, the former threatened and the latter a declining surveillance species – these are attractive small trees).
- Maintain germplasm (seed) banks for particular sets of populations.
- Propagate selected species, subject to recovery plans.
- Provide research on the horticultural, reproductive and growth characteristics of species.
- Display progress of management, and recovery, of key threatened species.
- Encourage members of the public to become involved in specific projects.

For indigenous rare and threatened plants, the growing of regionally important plants is important. A significant number of the plants that qualify have attributes that make them attractive in, or amenable to, cultivation. There is potential to make use of these for amenity purposes as, for example, specimen plants, flowering borders and hedges.

There are also additional important types of plants to be grown for conservation purposes and this means setting space aside for heritage flowering plants, vegetables, trees, cultivars that are scarce and now largely out of production, and species that have cultural value for Maori. This not only includes indigenous (New Zealand native) plants but may also include exotic species.

Threatened species recovery plans/programmes

The Department of Conservation has a system of threatened species recovery plans and consequent programmes for species at high levels of risk. There are opportunities for botanic gardens to offer expertise and also space for growing specimens of known origin. They also provide the opportunity to publicise such species and inform about what is being done to conserve them, and to:

- Grow examples of species that are included in the recovery plans.
- Use recovery plans as educational and interpretative tools.

Networking partnerships in conservation

Conservation of biodiversity involves working with local groups, city-wide networks, professional associations, research agencies and government policy makers.

North America provides some of the best examples of the consortium approach to conservation through botanic gardens networks³⁴. Two major programmes have emerged. One is the North American Plant Collections Consortium (NAPCC), a programme administered by the American Association of Botanical Gardens and Arboreta. This has established several gardens that are responsible for selected groupings of plants of conservation concern. Candidate gardens have to meet minimal criteria and make a commitment to the programme, but may affiliate with partner organisations to achieve this.

In taking action on the Biodiversity Strategies for Christchurch and Banks Peninsula (in draft at the time of publication of this management plan), there is a major need for effective partnerships.

³⁴ Briggs, G. 1997. North American plant consortia. In: Touchell and Dixon, K. W. (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGCI. Pp. 37-39.

For the Gardens, these include:

City Council teams concerned with areas other than the Gardens, Hagley Park and Mona Vale.	Banks Peninsula Conservation Trust.
	Environment Canterbury
Department of Conservation.	New Zealand Restoration Network.
University of Canterbury.	New Zealand Plant Conservation Network.
Lincoln University.	Other South Island botanic gardens and parks.

There is particular need for the Gardens to engage closely with other botanic gardens and with specialist nurseries in the Canterbury region. Furthermore, there is an opportunity for the Gardens to be a 'shop-front' for other collections of conservation value and for natural sites. Examples include:

- Arthur's Pass National Park.
- Travis Wetland.
- Department of Conservation nursery at Motukarara.
- The Port Hills.
- Hinewai Reserve on Banks Peninsula.
- Riccarton Bush.
- The Edgar Stead *Rhododendron* collections at Canterbury University.
- The city's 'heritage garden parks'.
- Private garden collections that are open to the public.

Developing an invasive plants and biosecurity policy

Invasive animals and plants have negatively affected the natural function of ecosystems, agriculture and human health world-wide. The deliberate introductions of invasive exotics such as gorse, purple loosestrife (as an ornamental), old-man's beard, Darwin's barberry and sycamore

continue to be disruptive. Despite rapidly growing awareness of the negative ecological consequences of invasive exotics, botanical gardens and arboreta have potential to be a source of invasive exotic plants.

The New Zealand government's biosecurity policy that shapes expectations and procedures for the future includes ten 'first steps' and a set of fifty seven 'expectations'. Clearly, botanic gardens must adhere to, and support, such policy while recognising that it is necessary to be able to continue to acquire key plants from overseas. General policy for the Gardens should be to consider excising known seriously invasive exotics from existing collections and not include these in accessions in the future. Where there is a compelling reason to grow any such species, it is crucial to ensure that they are effectively contained, monitored and managed to prevent spread.

Known or potential invasive species must not be distributed or sold via the Gardens, either directly or indirectly. This should include all species currently listed as being undesirable alien species in a home and public garden environment. Often ignored is the introduction of micro-organisms into gardens, from where they can unwittingly be spread to further sites. A number of examples serve as warnings that plants shifted from the wild to cultivation, or vice versa, can both carry and acquire diseases and pathogens.

Overall, it is necessary to ensure that the Gardens activities comply with agreements, such as the *National Pest Plant Accord* that sets out expectations at country, local government and community level³⁵. The Gardens should, in fact, be a major promoter of such agreements. It should also be at the front line in identifying the presence of new pests. Specific precautionary and response strategies might include³⁶:

- In collaboration with MAF Biosecurity, a surveillance system for early detection of pests.

³⁵ *National Pest Plant Accord*. See <http://www.biosecurity.govt.nz/pests-diseases/plants/accord.htm>.

³⁶ Partly based on preliminary discussions with Ministry of Agriculture and Fisheries (MAF) Biosecurity, September 2004.

- The training of staff to recognise potential pest problems.
- An educative training module on biosecurity.
- Notification to MAF Biosecurity whenever there is a potential pest problem.
- The facilities to isolate affected plants, including use of an isolation glasshouse.
- A public response mechanism so that people understand the issues when there is a problem.

Managers of the Gardens must adhere to legal requirements for importation of plant materials, while also being active in improving procedures through submissions received and discussion. The present system is not perfect and there is a need for industry consultation, especially on the Biodiversity Index, which is the national list compiled by ERMA³⁷ and MAF of all organisms believed to be in New Zealand.

Educative aspects of conservation

Many botanic gardens have education programmes that link with conservation initiatives, and are considered an essential part of their basic function. The interactive educational role that can be developed includes:

- Providing advocacy when seeking support from government, local community institutions, media, specialist groups, landowners and the public.
- Assessing local community attitudes, explaining benefits and allaying concerns.
- Raising awareness of why rarity has occurred, thus reducing future risks.
- Explaining cultural, economic and historic values of species being reintroduced.
- Attracting and motivating volunteers to act as guardians.

³⁷ Environmental Risk Management Authority (ERMA) New Zealand.

- Developing education materials using real examples and case-studies.

The United Nations Intergovernmental Conference on Environmental Education in 1977 defined 'environmental education' as "fostering clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas; providing every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to improve the environment; and creating new patterns of behaviour of individuals, groups and society as a whole towards the environment"³⁸. Community education programmes are the core of effective conservation action and largely determine the success of direct conservation actions – botanic gardens are well placed to take a leadership role.

'Learning Through Action' is the Christchurch City Council's Learning Experiences Outside the Classroom (LEOTC) environmental education provider, provides learning experiences outside the classroom, with an emphasis on conservation outcomes. Running for several years, it has been supported by the Ministry of Education. Through it, a number of previously independent initiatives have been brought together under one umbrella. Currently, the programme has a full time coordinator and two part time deliverers. A Greenspace education strategy is being developed and this needs to not only address the needs of education in natural areas but also education in the distinctive Gardens context.

One of the results of various approaches, locally, for conservation education visits, and also due to the worldwide trend towards botanic gardens being centres of conservation awareness and education programme, is the need to formalise use of staff approaches. The alternative of staff time being eroded by increasing demands in this area is not acceptable.

³⁸ Smith, A. 1997. Environmental education in botanic gardens - is it helping to save biodiversity? In: Touchell and Dixon K. W. (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGCI. Pp. 323-328.

Wildlife habitat in the Gardens

The Gardens is significant for wildlife. People who visit the gardens are often surprised at the range of wildlife, especially birds that can be seen. Some of the special wildlife features that the Gardens have are:

- A colony of little shags that are well established at the Information Centre Lake.
- Growing numbers of New Zealand scaup, a diving duck that is regarded as threatened at the global scale.
- Large numbers of eels in parts of the Avon River.
- Kereru (New Zealand pigeon), which can be regularly seen at close quarters.
- Paradise shelduck, now nesting in the gardens after an absence of some years.
- Nesting welcome swallow.
- Occurrence of freshwater crayfish.
- Over eighty species of fungi present.

In addition, the adjacent area of Hagley Park is the source of interesting bird records that are rare for Christchurch. Recently, this has included long-tailed cuckoo and crested grebe.

The list above is short on invertebrates (especially insects), mosses, lichens and fish. This is largely because of lack of knowledge, especially for insects. In part, this has been addressed by running a BioBlitz³⁹ in the Gardens and Hagley Park in April 2005. This was a twenty four hour opportunity to catalogue the total biodiversity of the area. It was primarily an awareness exercise, but a good spin-off will be a better knowledge base on the animals, plants and fungi of the gardens. The results of BioBlitz provide a base to which other records of the occurrence of animals, plants and fungi can be added.

³⁹ An event where Council staff, scientists, students and the public gathered in the Park and the Gardens to count as many species as possible in a 24 hour survey.

The Gardens is part of an inner city green area, which is major by world standards. It is the 'green lung' of the inner city, but is also a place where it is possible to glimpse something of the natural biodiversity of the city. Some specific wildlife and habitat issues to address are:

- Diminishing the number of mallard and mallard-grey duck hybrids.
- Possible creation of a small mainland island, with predator proof fencing, based around the native forest section of the Gardens.
- Inventory and monitoring of biodiversity on a regular basis.
- Avon River habitat enhancement to recreate a full 'living river'.
- Translocations and reintroductions of native species into special habitat areas; for example, lizards in areas where there is rocky habitat, such as in the Rock Garden.
- Limited habitat creation for icons of Canterbury; for example, mudfish.
- Consideration of old trees for bird nesting and rotting logs for invertebrates, when implementing a sustainable and healthy tree plan.

Conservation of energy and waste

The City operates Target Sustainability⁴⁰ as a programme that helps Christchurch businesses to move towards sustainability by improving resource efficiency, minimising waste and reducing the risk of harming the environment. The aim of Target Sustainability is to develop innovative, profitable and accountable businesses that integrate sustainable economic, social and environmental values in their thinking, decision making and behaviour in Christchurch City. Benefits include:

- Minimising waste and using resources efficiently to reduce costs.

⁴⁰ <http://www.ccc.govt.nz/TargetSustainability/>

- Improved compliance, and reduced liability, under the Resource Management Act 1991 and other statutes and regulations.
- A better marketplace image through a demonstrated responsibility toward sustainability.
- Reduced risk of environmental damage and liability.

Within the Gardens, the Curator's House Restaurant, established in 2000, has adopted Target Sustainability guidelines. The owners have brought an environmental approach to the business. A feature is the restaurant's organic garden, produce from which is used in the restaurant. Eco-education is the primary focus of the business and "zero waste" practices have been incorporated into its daily operations. The Restaurant participates in Natural Step⁴¹ and within twelve months of implementing the programme, they had nearly achieved zero waste to landfill.

The new Christchurch Art Gallery is a good example of planning for waste minimisation before the opening of a premise. Through stipulating energy efficiency as a key design element in the design brief, and setting up waste minimisation systems before staff began work in the building, savings of \$35,000 on energy costs and a reduction in solid waste to landfill of over 50% has been made.

What is the Gardens currently doing for waste management?

It is:

- Recycling leaf mould.
- Composting and reusing soil and plant material.
- Selling wood and storing timber slash for use as mulch around the City.

⁴¹

<http://www.ccc.govt.nz/SustainableChristchurch/WhatIsSustainableChristchurch/#NaturalStep>

Composting staff food scraps.

There is the need to develop a more comprehensive policy for all types of waste and, for the Gardens, to progress towards Zero Waste and Natural Step accreditation. In addition, there is the need to assess the contribution the Gardens and Hagley Park make towards carbon sequestration,⁴² with the aim of achieving a positive balance.

The City Council is committed, in its operations, to the efficient use of energy and to energy conservation (refer to Corporate Environmental Policy Statement⁴³). This can be taken to apply to resource consumption, including of water and direct energy (mostly electricity). New facilities in the Gardens, such as buildings, glasshouses and conservatories, should not only be cost efficient, but also highly energy efficient. In the short term, an energy audit should be undertaken to determine energy use and identify wastage at the present time.

A conservation strategy framework

Goal 10: *A role in the conservation of rare and threatened plants, both indigenous and exotic, will be maintained in the Gardens, with respect to the Gardens collections and wild populations of those plants.*

Action 10.1: Horticultural information that can increase plant recovery programme success will be sought to be provided by the Gardens, and appropriate outputs for this will be developed.

⁴² Carbon sequestration is the term describing processes that remove carbon from the atmosphere.

⁴³ Christchurch City Council policy, 26 November 1997

(<http://www.ccc.govt.nz/Policy/CorporateEnvironmentStatement.asp>)

Action 10.2: For selection of target species for conservation collections, a priority will be put on regionally rare and threatened species, scarce heritage plants and declining cultivars - this includes redevelopment of a collection of rare and endangered species with a regional emphasis.

Action 10.3: A germplasm bank will be promoted as a collaborative facility for long term storage, and availability of, seed and other tissue of plants of significant conservation value.

Action 10.4: Opportunities for preservation and enhancement of wildlife habitat will be sought, and wildlife conservation recognised as a significant Gardens role.

Goal 11: *The Gardens will be an advocate, and information source, for biological conservation, especially through case studies, well interpreted collections and publicity.*

Action 11.1: The Gardens will be a 'shop front' for regional conservation issues, including the public having access to collections of plants of conservation interest, the featuring of projects and issues via a website, and acting as a clearing house for information.

Action 11.2: Environmental education will be vigorously developed, keeping in mind both international guidelines and the Christchurch City Council Learning Through Action (LEOTC) programme, as well as other partnership opportunities for a range of ages and cultures.

Goal 12: *A targeted biosecurity policy will be developed for the Gardens.*

Action 12.1: Known invasive alien plant species, and plant species where there is a high risk of pest potential, will only be retained in Garden collections when it is practical to subject them to strict containment or stringent monitoring.

Action 12.2: Invasive species will not be distributed by the Gardens or its associates through gifting, exchange or sale.

Action 12.3: The Gardens will take all reasonable steps to ensure that its collections are not vectors for unwanted micro-organisms, especially in relation to plants shifted from the wild to cultivation or vice versa.

Action 12.4: A feasibility study will be scoped for an early warning system to detect pests and unwanted organisms, in collaboration with Ministry of Agriculture and Fisheries Biosecurity.

Action 12.5: As resources allow, an isolation glasshouse facility will be developed, according to MAF Biosecurity requirements, to isolate incoming accessions and to isolate outbreaks of diseases and pests.

Goal 13: *External policies and strategies on conservation will be adopted as far as is practicable for the Gardens.*

Action 13.1: The Gardens will support and promote the objectives and targets of the *Christchurch City Council Biodiversity Strategy*, the *New Zealand Conservation Strategy* and the *National Pest Plant Accord*, as well as comply with other relevant national and regional conservation strategies, and all relevant legal and regulatory biosecurity requirements.

Action 13.2: The Gardens will support and actively promote the *Global Plant Conservation Strategy* under the Convention on Biological Diversity, including achieving national targets, and apply the framework for good conservation practice by botanic gardens as promoted in the *International Agenda for Botanic Gardens in Conservation*.

Goal 14: *The Gardens will adopt good conservation practice in its operations and infra-structure.*

Action 14.1: Horticultural practice will include bio-control techniques, as far as possible, and elimination of toxic chemical use, except where absolutely necessary.

Action 14.2: Energy conservation, waste elimination and recycling will continue to be introduced into all practices, buildings and other infra-structure.

Action 14.3: The Gardens will seek Natural Step and Green Globe Certification.

Goal 15: *Networking will be undertaken, as necessary, by the Gardens to enhance its conservation role, including advocating good conservation practice and policy, and seeking membership of appropriate organisations.*

Action 15.1: A leading facilitating role within the framework of the Christchurch City Council Biodiversity Strategy will be sought, including hosting forums and lectures, and advocating strongly for conservation.

Action 15.3: Recognising the advantages of integrated conservation and involvement with a wide range of stakeholders, the Gardens will identify and work with conservation stakeholders, and ensure that there is active botanic garden membership in key conservation networks.

Action 15.4: The Gardens will work towards effective linkages into conservation databases, both within New Zealand and overseas, including electronic data transfer, and play its part in a clearing house role for a botanic gardens network.

CHRISTCHURCH BOTANIC GARDENS MANAGEMENT PLAN (AUGUST 2007)

- PART IV ISSUES AND ACTION PLAN -

26. Conservation

Table 26.1: Conservation activity (development/ action) priority chart

	More urgent		Less urgent	
	More important	Less Important	More important	Less Important
Cannot be done or completed within existing budget – major capital or operational item	<ul style="list-style-type: none"> ▪ Threatened plant collection 		<ul style="list-style-type: none"> ▪ Germplasm (seed) bank ▪ Environmental education facility ▪ Energy/waste conservation 	<ul style="list-style-type: none"> ▪ Isolation glasshouse
Can be done within existing budget – may often involve attitudinal change	<ul style="list-style-type: none"> ▪ Selection of target species ▪ Conservation ‘shop front’ ▪ Pest species policy ▪ External policies adoption 	<ul style="list-style-type: none"> ▪ Wildlife habitat policy ▪ Networking facilitation ▪ Clearing house role 	<ul style="list-style-type: none"> ▪ Compilation of horticultural info. ▪ Education programme ▪ Good conservation practice ▪ Certification (such as Natural Step) 	

27. HERITAGE

Explanation:

“Heritage” is about the appropriate recognition and maintenance of features of the Gardens that are of historical value where it is not contrary with meeting the principal purpose of the Gardens.

Objective:

Key heritage and cultural values will be recognised and preserved in the Gardens, and appropriate recognition, interpretation and public events will be encouraged and facilitated to enhance and celebrate these values.

General heritage issues for the Gardens

It is often plants and their layout that most people think of if asked about the Gardens. Although collections and layout are primary considerations, the Gardens as a whole is more than this. It has its own place in history and important historic sites and cultural values.

The Gardens were established only seven years after the founding of the settlement Of Christchurch by the Canterbury Association. Since then, the Gardens has been undergoing its own historical walk. This mirrors the changing attitudes and fashions of the City.

Many of the trees in the Gardens reflect the fabric of history. The first recorded tree planting in the Gardens was on 9 July 1863 and this tree is still in good health. Since that time, commemorative trees have been planted by a wide range of people, including royalty, Heads of State, Rotary International presidents and notable local people. Some trees commemorate special events related to the Gardens.

The Gardens and its immediate environs has a number of sites associated with the history of Canterbury, especially in the nineteenth century and early twentieth century. Some have been recognised by plaques, but other sites are not marked. The Gardens have several buildings of heritage value, reflecting design influences of the nineteenth century. History in the Gardens, though, relates not just to the development of

Christchurch, but to diverse other activities, such as the association of Christchurch with the Antarctic, and the importation of exotic species of animals.

What are some of highlights in the history of the Gardens? These include:

- Planting of the Prince Albert Edward oak – this is generally taken to represent the founding of the Gardens.
- The spring that provided the water for the first European settlers.
- The place where John Godley made his farewell speech to the early settlers.
- The acclimatisation site in the woodlands of Hagley Park between the Avon River and the hospital, where animals were held prior to release into the wild.
- Captain Robert Falcon Scott visiting Christchurch on his way to the Antarctic due to the gravity band magnetic station in the Gardens, leading to today’s valuable Antarctic industry in Christchurch.
- Adjacent to the present day Botanic Gardens Car Park, off the entrance from Armagh Street, the site of the 1906 Christchurch exhibition - this was a vast international exposition.

The Gardens site has a history that extends much further back. Prior to European settlement, a large area that included the eastern part of the Gardens was the site of an extensive settlement of Maori people. The Gardens were part of an area known as Putaringamotu (‘Place of an Echo’) by Ngāi Tahu, for whom the Avon River was an important food source. Ngāi Tahu heritage and its associated values need to be taken into account. This involves partnership, recognition of *taonga* and *mahinga kai*, regard for viewpoints on biodiversity including wildlife, and respect for places, traditions and knowledge⁴⁴.

⁴⁴ See *Synthesis of previous submissions made by Ngāi Tahu for the purpose of a submission to the Hagley Park / Botanic Gardens public consultation, at Ngāi Tahu’s request*. December 2004.

Going even further back, prior to human occupation, the sea was much further inland than it is today and this is reflected in sand dune remnants. Soils reflect the history of inundation and unstable river systems that once swept across the Christchurch urban area. There is a largely buried and, in many instances, destroyed pre-human history of the area that is still not fully understood.

Past Garden design and development has important heritage implications. Until recently, there has been a lack of precise information on layouts and even some past historic structures and features. Particular parts of the Gardens layout and landscaping have heritage value as examples of period design and planting. This includes the Armstrong Lawn and Archery Lawn (created by J. F. Armstrong), the Rock Garden (designed and erected by William Brockie) and the Rose Garden (James McPherson). Each generation of staff add new layers to the heritage of the Gardens. Recent study of the evolution of the Gardens design and landscaping will help identify those parts of the Gardens that retain remnants of earlier layouts.

What is surprising is that some of the most significant parts of this history are poorly known to the public. Therefore, archives are important. As information comes to hand, it is archived. An example is information, including photographs, relating to the geophysical buildings and associated garden layout early last century. Some of this has been accessed from overseas (for example, from the Carnegie Institute) and shows not only buildings that no longer exist but even that there were streams within the Gardens that no longer exist.

The Gardens also include an implied heritage in what they say about the world of plants in general, the stories associated with plants and, especially, the heritage of flora in Canterbury, both native and introduced. This is part of the celebratory aspect of the Gardens overall role and direction.

Public perceptions

Heritage issues have drawn comment from a relatively small number of submitters in the public consultation processes that have been held, but comments made have been in depth. Some public are unaware of heritage values existing in the

Gardens, so there is clearly a need for a signage strategy to direct the provision of the optimum signage to clearly identify these values and for there to be more documentation of heritage features, generally.

People feel that heritage should be recognised as a legitimate component of the Gardens. Submissions identified the need to ensure that planting and collections around heritage features are sympathetic to those features. There is also the need to ensure that any modification of heritage structures is in keeping with their heritage value.

Long term strategic planning for heritage values is recognised as necessary, and that it is done broadly to include living features as well as deal with arguably neglected sites, such as the Riccarton Avenue house and garden in Hagley Park.

Special issues

Documentation of history and heritage

It is when people come to write historic accounts, or are asked questions by visitors, that it is realised how little is known in detail about some of Christchurch's most cherished institutions. The Gardens are no exception. Information on successive curators of the Gardens is often meagre. Yet curators, such as John Armstrong, had an enormous formative influence on the Gardens.

Most of the essential legal and map information relating to the early history of the Gardens and Hagley Park has been documented⁴⁵. This compilation is a rich record of the early days of the Gardens and its surrounds, providing a valuable insight into not only legal events but also attitudes and intent.

It is vital that the Gardens maintain a record of events. Every significant event should be recorded by photographs, in written form and even video. Comments on the Gardens need to be recorded, maps and diagrams kept, and significant correspondence retained in a form so that it can be indexed and retrieved as needed. Much in the way

⁴⁵ Status investigation. Hagley Park and Botanic Gardens, Christchurch. September 2002.

of simple history can be lost because at the time it seemed insignificant.

This means developing two further facilities. One is a process for systematically recording and storing information; the other is to ensure that the Gardens has a modern archival storage and study area. This requires that vital historical information is able to be readily searched for. Archival and heritage records attract both researchers and volunteers and so there will be a need to adopt very strict standards for obtaining, conserving and using archives.

Links with cultural neighbours

The Gardens are strategically placed at the western edge of the Christchurch central business district (CBD). They are an inner city facility and, as such, have a long association with the history of Otautahi-Christchurch. Many things that are important to the City happen in the vicinity of the Gardens – the immediate area is rich with firsts and anniversaries.

We are sometimes slow to realise the deliberate care with which buildings were placed by the founders of nineteenth century Christchurch. As pointed out by Professor Ian Lochhead, the position of the Cathedral and the Museum – the latter, the immediate neighbour of the Gardens - is especially significant⁴⁶:

The Worcester Street axis thus juxtaposed in graphic form the twin poles of the Victorian mind: Christianity and science, religion and culture. By any standards, this is a remarkable piece of urban planning. It is as if St Paul's Cathedral and the British Museum had been aligned at opposite ends of the Strand.

This has been recognised with the development of the Cultural Precinct concept, which extends from Cathedral Square to the Museum and the Gardens, and includes the Arts Centre (formerly Canterbury University), Canterbury Museum, Christ's College and, out on an extension along the Avon River, the Provincial Chambers. The concept recognises an assemblage of cultural and heritage icons that is rare by world standards. It is the

⁴⁶ Lochhead, Ian. Museum's preservation crucial. *The Press*, Oct 18 2004

southern hemisphere equivalent of the Mall of Washington, DC in the United States.

Increased links with cultural neighbours means opportunities for:

- Joint marketing.
- Recognition of common interests.
- Developing a *locale* where visitors can spend the whole day (and evening), including all needed facilities.
- Development of seamless tour guiding between partners.
- Sharing experiences and adopting common practices.
- Joint and coordinated events and exhibitions.
- Linked development of heritage and cultural strategies.

The special place of Ngāi Tahu

Ngāi Tahu Whānui, represented by Papatipu Rūnanga and Te Rūnanga o Ngāi Tahu, comprise people of Ngāi Tahu, Ngāti Mamoe and Waitaha descent, who hold *manawhenua* over an area that includes Christchurch. *Manawhenua* refers to those *whānau* (families) and *hapū* (extended family groups) with customary linkages and rights to an area, or resource through *tikanga* (lore and custom). Te Rūnanga o Ngāi Tahu was established by the Te Rūnanga o Ngāi Tahu Act 1996 to give a legal identity to the tribe and to represent the tribal collective of Ngāi Tahu Whānui⁴⁷.

Te Rūnanga o Ngāi Tahu and the affected Papatipu Rūnanga have worked closely with the Christchurch City Council in the development of policies and publications; for example, the "Christchurch Naturally – The Biodiversity Strategy" glossy. Such partnerships enable Ngāi Tahu to support the goals of these strategies,

⁴⁷ See *Synthesis of previous submissions made by Ngāi Tahu for the purpose of a submission to the Hagley Park / Botanic Gardens public consultation, at Ngāi Tahu's request*. December 2004.

especially where they relate to such places as the Avon River/Ōtakaro and the achievement of planning goals within the central city.

The Avon River is of special importance for Ngāi Tahu, who value links with waterway protection and their values. Low flows are of particular concern to Ngāi Tahu and policies could encourage flow supplementation in times of low flow to protect habitat and biodiversity values that, in turn, protect the *mauri* of the river. It is necessary to ensure that appropriate policy is developed, including the following:

- Acknowledgement of habitat and biodiversity values of the Avon River waterway and tributaries.
- Identification of specific sites of importance for wildlife habitat and biodiversity, including sites and species of importance to Ngāi Tahu.
- Identification of indigenous fish spawning sites.
- Identification of specific areas for fish habitat enhancement.
- Recognition of the link between water quality and quantity.
- Provision for the drainage function of the river (flood protection).
- Enhancement of springs that are *tapu*.
- Acknowledgement and protection of *mahinga kai* sites and species, and of other species of importance to Ngāi Tahu.
- Plantings to encourage indigenous bird species.
- Preference to use locally sourced indigenous species for all plantings, except where identity areas specifically identify exotic species to be used.

Although all natural resources are considered *taonga* (treasures) by Ngāi Tahu, specific species are identified as *taonga* species in the Ngāi Tahu Claims Settlement Act 1998. These, and other, species of particular importance to Ngāi Tahu in

the Christchurch area need to be identified in formal planning documents.

Another important aspect is *mahinga kai*, which encompasses the social and educational elements of food gathering. It includes the way resources are gathered, the places they are gathered from and the actual resources themselves. The Ngāi Tahu commitment to *mahinga kai* and customary use implies sustainable use and the need to manage, protect and restore species, habitats and ecosystems to enable such use to occur. Information on culturally sensitive sites in Hagley Park and the Gardens needs to be protected appropriately, and it is necessary to work with Ngāi Tahu to establish appropriate ways of protecting sensitive site information. In addition, Ngāi Tahu involvement in biodiversity interpretation and education allows Ngāi Tahu values for biodiversity to be conveyed correctly⁴⁸.

The legal basis for heritage recognition in the Gardens

The Resource Management Act 1991 is the enabling legislation for local authorities to designate heritage.

Examples of heritage under the Act can include:

- Buildings and other built structures.
- Archaeological sites.
- Places of special significance to Maori.
- Trees, and other vegetation, with historic or cultural associations.
- Places where past events have taken place.

The New Zealand Historic Places Trust considers the combined areas of the Gardens and Hagley Park to have a high degree of historical heritage significance, certainly at a national level and probably internationally⁴⁹.

⁴⁸ See *Synthesis of previous submissions made by Ngāi Tahu for the purpose of a submission to the Hagley Park / Botanic Gardens public consultation, at Ngāi Tahu's request*. December 2004.

⁴⁹ Jo Bain, NZ Historic Places Trust, e-mail, August 2004.

Heritage status of trees

Heritage status is commonly accorded to hard structures, such as buildings, but less often to living organisms, such as trees. Under the Historic Places Act 1993, the key date is 1900. Anything older than that can be considered for protection under this Act. However, a significant number of Gardens trees were planted prior to 1900. The historical significance of some of these older trees may require genetic material to be conserved for the future. This, in turn, requires a germplasm collection to ensure that there are replacement plants of the same genetic stock available.

Developing a heritage conservation plan

There are strong arguments for development of a Heritage Conservation Plan. The Historic Places Trust has expressed interest in taking an active participatory role, alongside the City Council's Heritage Team, to guide the planning process.

An issue is the extent to which plantings and design in the Gardens have heritage significance. The early design of the Gardens was strongly influenced by Victorian/Edwardian era park/garden design styles. This was a natural consequence of the English garden estate training of most of the early curators. The evidence of these influences can be clearly seen in the presence of:

- Lawns with large numbers of specimen trees, mostly planted by the early curators.
- Shrub borders.
- Closely mown lawns, punctuated with formal carpet bedding.
- Specialist feature gardens, for example, the Water Garden, Rose Garden, Rock Garden, and Herbaceous Border.

The over-riding motivation for amassing plant collections in Christchurch appears to have been horticultural interest, although curators such as J. F. Armstrong and L. J. Metcalf were also interested in plant collections for scientific purposes. However, there has never been strong and consistent botanical emphasis, such as the

presence of a State Botanist has given in some Australian botanic gardens.

The Historic Places Trust has set out a number of important guiding principles and these need to be recognised as basic to a heritage conservation plan⁵⁰:

- Promote a conservation approach toward the management of effects on heritage values and retain as much of the existing heritage fabric⁵¹ as possible.
- New material should be compatible with the existing heritage fabric – compatible design is that which is sensitive to historic structures and compatible with them in terms of size, scale, colour, material and character of the property and its context.
- Do not distort the evidence of the past – do not attempt to fool the observer into thinking a recent construction is much older and part of the original historic structure.
- Evaluate each situation to achieve minimum intervention.
- Provide for the conservation of any significant heritage fabric and contents that are removed from the historic place.
- Provide for the dissemination of heritage information.

Guidelines for heritage practitioners should be adopted in the development of a Heritage Conservation Plan for the Gardens.

For Council guidelines, go to <http://www.ccc.govt.nz/Christchurch/Heritage/Information/ConservationPlans.asp>.

⁵⁰ Historic Places Trust 2004. *Heritage Management Guidelines for Resource Management Practitioners*.

⁵¹ Heritage fabric includes any physical element or finish which is part of the heritage value of a building, place, or object. Original heritage fabric is an integral part of the initial heritage item. Subsequent changes that contribute to the record of the historic development of the heritage item are also considered to be part of the heritage fabric. This also includes the aggregate effect of material weathering and wear due to historic use.

A heritage strategy

Goal 16: *The interpretation of 'heritage' will be broad enough to include all likely heritage assets of the Gardens.*

Action 16.1: Built heritage in the Gardens will be recognised as part of the City's asset system, and the extent to which plantings, design and layout are part of heritage (especially those that originate before 1900) will be determined as part of an overall conservation plan.

Action 16.2: Historic interpretation and research will be broad enough to include geologic and geomorphic history of the site, and potentially on living components, such as historic and unique trees.

Action 16.3: There will be a particular focus on sites clearly identified by Ngāi Tahu as having heritage significance.

Goal 17: *The Gardens managers and planners will adhere to all legislative requirements, consider expert recommendations and develop appropriate partnerships to assist in the recognition, preservation, use and disposal of heritage.*

Action 17.1: Gardens management and planning needs to take full account of legislative requirements, the need to partner with Heritage Christchurch (Christchurch City Council) and the Historic Places Trust, the status of the Gardens under the Historic Places Act and Resource Management Act, and of trigger points for action.

Action 17.2: The Historic Places Trust guidelines for heritage practitioners should be adopted in the first instance in developing a Heritage Conservation Plan for the Gardens.

Action 17.3: Heritage expertise will be sought when significant alterations to heritage, and older, items are contemplated, and alterations will take account of heritage management requirements under both the City Plan and the Historic Places Act.

Action 17.4: Ngāi Tahu values and involvement will be fully acknowledged and acted on positively.

Goal 18: *Heritage and history of the Gardens will be permanently recorded and maintained for both present and future generations.*

Action 18.1: A summary will be prepared that includes all significant heritage features and significant historic events, as a basis for ongoing research and greater recognition of history and heritage in the Gardens.

Action 18.2: Archives are irreplaceable treasures, and the proposed new building for the Gardens will have an archival unit for preserving, and making available, archival material, which will be maintained and handled under approved archival standards.

CHRISTCHURCH BOTANIC GARDENS MANAGEMENT PLAN (AUGUST 2007)

- PART IV ISSUES AND ACTION PLAN -

27. Heritage

Action 18.3: Relevant contemporary history will be recorded, utilising a range of techniques from written and visual to interviews with past staff and other people associated with the Gardens; associated with this, dated records, such as maps and photographs, will be preserved as a historic record of change, modification and innovation.

Action 19.2: Heritage will be interpreted, once sites and areas have been identified, involving a range of methods that include site markers, written and visual material (from on- and off- site, as appropriate) and self-interpretation trails, as appropriate.

Goal 19: *Outputs for heritage information and research, which get information to a wide audience, will be actively promoted and used by the Gardens.*

Action 19.3: Events that celebrate the Gardens heritage features will be promoted, as appropriate, and suitable heritage will be linked to that of neighbours and city-wide historic trails and routes, such as the Antarctic Trail.

Action 19.1: The Gardens will be committed to promoting and making known its historic features and heritage events to its users.

Table 27.1: Heritage activity (conservation/action) priority chart

	More urgent		Less urgent	
	More important	Less Important	More important	Less Important
Cannot be done or completed within existing budget – major capital or operational item	<ul style="list-style-type: none"> ▪ Conservation plan 	<ul style="list-style-type: none"> ▪ Heritage interpretation 	<ul style="list-style-type: none"> ▪ Archival facility 	<ul style="list-style-type: none"> ▪ Celebratory events
Can be done within existing budget – may often involve attitudinal change	<ul style="list-style-type: none"> ▪ Summary compilation ▪ Ngāi Tahu discussion 	<ul style="list-style-type: none"> ▪ Contemporary history determined ▪ Advice on buildings received 	<ul style="list-style-type: none"> ▪ Archival standards ▪ Heritage promotion ▪ Neighbour links 	

28. EDUCATION AND AWARENESS

Explanation:

“Education and awareness” for the Gardens is about providing the opportunity for the public to acquire knowledge about plants and their habitats.

Objective:

The Gardens will provide effective interpretation outputs and education programmes to inform about and promote the role of plants, wise use of natural resources and of human relationships to nature.

Background

A powerful niche for botanic gardens is in the area that can be loosely called education but which actually includes a wide range of associated activities that can be aimed at an equally wide range of people, age groups, ethnicities and contexts. Programmes to cope with this range can be responsive or innovative⁵². The responsive programmes meet specific needs (especially curriculum needs), while education innovation includes programmes for special groups such as high achievers and the disabled, horticultural, landscape and plant-craft programmes, specialised awareness programmes for adults and in-service teacher programmes. Botanic gardens have for centuries been primarily concerned and focus on education, with the early European gardens based on medicinal and botanical learning. Horticultural training has a long history of indentured tradesman learning within a botanical setting.

As far back as 1595, the Botanic Garden of Pisa in Italy had a mission statement that it would “provide a place for young students to learn about nature and properties of plants” this being carved in stone at the entrance to the garden⁵³. As this

indicates educational programmes in botanic gardens are far from new. In fact many gardens round the world have run education programmes of one sort or another although it is probably in the last two decades that they have tended to focus especially on conservation of biodiversity as a common theme. Examples of such programmes include:

- One hundred plants to know, to use, to save – Botanic Garden of Pisa⁵⁴.
- People and plants - Chelsea Physic Garden⁵⁵.
- Belize Botanic Garden tropical classroom⁵⁶.
- ECO-ACT – an environmental leadership program for high school students – Missouri Botanical Garden⁵⁷.
- Children especially of school age – both formal and curriculum-related and informal.
- Ongoing education through to senior citizens.
- Short courses and weekend/evening opportunities to learn particular skills for example, in home garden techniques.
- Workshops – which can range from ‘master-classes’ to special interest weekends.
- Guiding services.

The BGCI⁵⁸ have developed education guidelines, focusing on environmental education in botanic gardens with stated goals to:

- Provide help and guidance to botanic gardens setting up environmental education programmes.
- Emphasise the essential role that education in botanic gardens has to play in the conservation of plants and their habitats.

⁵² Boden, R.W. and E.A. Boden 1987: Botanic gardens and community education in Australia. In, Bramwell, D., O. Hamann, V. Heywood and H. Synge (eds.), *Botanic Gardens and the World Conservation Strategy*. Academic. Pp. 67-74.

⁵³ Bedini, G. 1997: Conservation projects in the Botanic Garden of Pisa. In, Touchell and K.W. Dixon (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGCI. Pp. 29-36.

⁵⁴ Bedini 1997.

⁵⁵ Sanders 1997.

⁵⁶ http://www.belizebotanic.org/trop_class.html

⁵⁷ <http://www.mobot.org/education/ecoact/index.html>

⁵⁸ Botanic Gardens Conservation International.

- Highlight the significant role of botanic garden education in implementing the major international strategies for biodiversity conservation (International Agenda for Botanic Gardens, Convention on Biological Diversity, Agenda 21, Global Strategy for Plant Conservation).
- Equip botanic gardens with a document that can be used to help raise funds for environmental education programmes.

In New Zealand, education programmes go back to at least the early days of the twentieth century; for instance the use of the Azalea Garden in the Dunedin Botanic Garden as a demonstration garden for trainee teachers⁵⁹, along with indentured apprenticeship in gardening. There are many opportunities but also there are a number of principles that need to be kept in mind for effective general communication of resources such as those held in botanic gardens⁶⁰:

- Visitors are diverse.
- Visitors usually anticipate a relaxed and enjoyable atmosphere.
- Interpretive information must be rewarding.
- Interpretive information must be understood.
- The effectiveness of information must be continually evaluated.
- People are motivated by either achieving something that will add an essential skill or a measurable qualification (for example, approved education credits).

What makes this especially challenging is that much botanic gardens education is likely to be informal. Therefore the botanic gardens must accommodate education processes that are both

curriculum-directed and open-ended. It is well recognised internationally that opportunities for education may be considerable. Just one example suffices, from Missouri Botanic Garden, St Louis, USA⁶¹. This Gardens Education Division is dedicated to developing a scientifically literate citizenry. 'Education at the Garden' serves the entire community through three major goals:

- To educate children and adults about plants, ecology, and the environment.
- To improve science education in the St. Louis metropolitan area.
- To create learning opportunities for visitors as they enjoy the Garden.

Missouri is just one example – there are many others, for example, Brooklyn Botanic Garden (New York), Kirstenbosch (Cape Town), Royal Botanic Gardens (Kew, UK). Kirstenbosch, for example, has a highly innovative programme that each day brings 40 school children from the under-privileged Cape Flats in a specially decorated bus to the gardens. The children are taught the basics of plant propagation and given a kit to take back their schools. Through this bare sandy school grounds are transformed into attractive settings and the children acquire both skills and an appreciation of nature⁶².

⁵⁹ Evans, A. 1993: From seed to science: aspects of plant collections management in Dunedin Botanic Garden. In: Froggatt, P. and M. Oates (eds.), *People, Plants and Conservation. Botanic Gardens into the 21st century*. RNZIH. Pp. 25-29.

⁶⁰ Based in part on Field, D.R. and J.A. Wager 1973: Visitor groups and interpretation in parks and other outdoor leisure settings. *Journal of Environmental Education* 5: 6pp.

⁶¹

<http://www.mobot.org/education/01goalsobjectives/goalsobjectives.html>

⁶² Given, D.R. pers. obs. 1998.

It is easy to say that the key issue will be money but innovation and creativity are equally important or perhaps even more so. As noted in a commentary on the present that challenges our vision for the future use of botanic gardens in education and awareness⁶³:

“Couldn’t our visitors learn about plants, and their habitats, and their relationships and interdependencies. Wouldn’t it be enormously satisfying, and great fun, to attempt such displays? And couldn’t it we include displays and interpretations of some of the animal life within the habitat? ... The most intricate, astonishing relationships exist within ecosystems, between microbes and trees and fungi and insects and flowers and birds.”

A key issue is that botanic gardens are not simply green venues for whatever people want to do. Every significant activity in the botanic gardens that involves education, awareness and interpretation should, have a purpose, undergo evaluation and have gardens sign-off. If education is a primary objective for the gardens it is critical that garden design consider how people learn in leisure settings. The following points are based on a distillation of significant research into visitor communication in leisure settings (parks, historic sites, museums, galleries, visitor centres, zoos and gardens)⁶⁴:

- Visitor involvement – visitors need to participate in interpretation. This can be achieved literally through techniques like physical interactives and using different senses and mentally and emotionally through techniques like evocative language, questions, use of sound, light and music and personal stories.
- Visitor learning and memory – developing interpretation which has clear themes presented logically can increase visitor’s long term learning about a place.

- Visitor attention – the most important messages need to be presented in ways that will interest the visitor by grabbing and maintaining their attention.

There is a need to provide information for a range of visitors. These are three commonly used terms for describing how different visitors use information⁶⁵.

Seekers

– people who actively seek information about their visit;

and also seek information about gardens and plants.

Stumblers

– people who aren’t particularly interested or seeking, but find well presented information interesting.

Shunners

– people who actively do not want information

Information can be layered geographically, visually and cognitively by using different reading levels. This may be the best way to reach seekers and stumblers without alienating too many shunners. Geographic layering is important and it has been suggested by one interpretive expert that ideally⁶⁶:

- Most information should be at entrances (visitor centre, information kiosk and information boards).
- Panels should be at main collections and built structures.
- Only labels and occasional interpretation features panels should be featured within collections.

⁶³ Hancocks, D. 1997: Time for metamorphosis. In, Touchell and K.W. Dixon (eds.), *Conservation into the 21st Century*. Kings Park and Botanic garden and BGCI. Pp. 81-85.

⁶⁴ Lynda Burns, Gardens Interpretation Strategy, 2nd draft, June 2004.

⁶⁵ Lynda Burns, Gardens Interpretation Strategy, 2nd draft, June 2004.

⁶⁶ Lynda Burns, Gardens Interpretation Strategy, 2nd draft, June 2004.

Similarly, strong visual cues need to be employed:

- Signs and displays to present main message (be it cognitive or affective) in larger type with more specialized or detailed message in smaller type.
- Use of symbols and graphics to appeal to visual learners.

And, with respect to cognitive aspects:

- Guides are trained to assess different interest levels and to present to different learning modes.
- Brochures, fact sheets and books provide in depth information for interested visitors in language appropriate to different readers.
- There is use a range of interpretive methods to appeal to different learning styles.

Good communication of the relevance and importance of the institution, its programmes and its relationship to people is vital. The visitor experience should be an enriching one so that people want to return again and again. A key part of this is to ensure that plant collections, the garden landscape, and the natural and cultural heritage are interpreted in an authentic and engaging way⁶⁷. Outcomes will include:

- Themes and stories that bring the plant collections and displays, place and people to life.
- Accurate and entertaining information using engaging display and communication media and methods.
- Having interpretive material and guided tour information meet appropriate standards and contemporary needs.
- Greater awareness and appreciation by visitors and clients of the value of plants, their biodiversity and the need for conservation.

A common trap for interpretation is to attempt to comprehensively cover all the relevant and important topics. This can lead to a proliferation of signs or visitor centre exhibits that are seldom read by visitors. Web-sites and fact-sheets are ideal places to provide this comprehensive information leaving more visible options like signs and displays to tell stories that appeal to most visitors. More comprehensive information can also be presented by well-trained guides who know the stories about plants and can communicate them in an engaging manner.

Issues

Interpretive materials in the Gardens at the present time are of mixed quality. They should aim to achieve⁶⁸:

- Relevance – provide the information required.
- Clarity – be well laid out and easy to follow.
- Accuracy – up to date and checked for errors as well as being horticulturally and scientifically accurate.
- Permanence – fixed signage should not be replaced every year, and brochures, etc. should not just trashed five minutes after being picked up.
- Innovation – there are various ways in which brochures can be designed to be kept by those who use them, e.g., by one side forming an attractive map or picture when unfolded.
- Cost effectiveness.

An important further consideration is the imparting of specific practical skills and wisdom, particularly to local people, to help them in growing and using plant materials. This can include a wide range of subjects:

- Growing vegetables and amenity plants.
- Plant maintenance.
- Soils, fertilizers and garden recycling.

⁶⁷ Strategic Plan 2003-2007, Royal Tasmanian Botanical Gardens, Hobart.

⁶⁸ Lynda Burns, Gardens Interpretation Strategy, 2nd draft, June 2004.

- Use of heritage crops.
- Turf culture.
- Arboretum and orchard management.
- Plant identification.

Interpretation focus

Education is an important botanic garden role but should not dominate to the extent that the gardens seem to be more a classroom or advertising venue than a place of botany, display and cherished landscape. The scientific should not dominate to the extent that every view of plants is dominated by labels like some sort of floral graveyard. There is need for innovation in how messages are presented and those messages must augment and support the basic botanic garden mission.

Botanical and horticultural interpretation

The Gardens are primarily 'botanical' and as such need to offer good interpretive signage and labelling for the visitor. There are a significant number of people who come to the gardens to see particular plants or plants of a particular type or from a particular region of the world. Thus it can be frustrating to have labelling absent, especially when it is apparent that plants were labelled in the past.

Major display areas should be labelled clearly with clear and simple interpretation of their significance. This includes not just 'botanical' collections but also areas such as the herbaceous border, explaining succinctly what is an herbaceous border and why it is important, perhaps with pamphlets available on site providing hints on how to create one's own herbaceous border.

The Gardens must aim at 100% accuracy and scientific fidelity. Names must be spelt correctly, families assigned correctly, and above all identifications must be correct. This requires a good editing process and preferably also a system that allows label generation directly from an overall edited database.

History and heritage interpretation

This is a neglected area for the Gardens. There is probably little realization in Christchurch that the botanic gardens have a considerable amount of 'hallowed' ground. This includes:

- Pre-European settlement sites by *tangata whenua*.
- The original spring used by Christchurch's first European settlers.
- The site where Robert Godley made his farewell speech to the settlers before returning to England.
- The Acclimatisation Society area where a number of New Zealand's most noted exotic animals were kept and underwent trials before release.
- The magnetic observatory that influenced Scott and Shackleton using Christchurch as a jumping off point for their Antarctic explorations and where subsequent researchers have calibrated their instruments since.

The Gardens has a number of notable monuments, several fountains, historic buildings and some permanent sculptural art works although not always displayed to best advantage. There does not appear to be a coherent policy on this at the present time and within the wider orbit of the City Council the Gardens are usually not recognised as being a significant repository of outdoor art works. This has been noted in a submission by the gardens on the current draft Outdoor Arts Works Policy.

Most of the older buildings and other structures such as fountains and gates have historic status under the City of Christchurch City Plan. Thus a walk round the Gardens is a walk through history amplified by its setting in a historic building precinct. It is anticipated that there will be continuing donations and bequests towards capital items in the Gardens as well as upkeep and re-development of existing items. A standard bronze plaque unique to the Gardens needs to be designed and used for such instances.

One particular problem is that there are many trees planted by noted personages throughout the botanic gardens. A long recognised problem has been the proliferation of metal and concrete plaques and plates associated with such trees. There is also some uncertainty regarding what happens when such trees die or need to be shifted and whether another tree is planted in place of the original or the name is transferred to another tree.

Guided tours, guides and interpreters

Among the 1.2 million visitors to the Gardens are two thirds of all tourists who visit the city. Most people visit the gardens on their own, and relatively few take advantage of tours, mostly organised by Friends of the Christchurch Botanic Gardens.

It is often difficult for botanic gardens to incorporate the guiding role into their permanent staff structure except at a coordinator level and to have dedicated staff to do guiding despite a constant demand from visitors. As with many botanic gardens, Christchurch handles this increasingly through its Friends organisation. For some years the Christchurch Friends have run regular guided walks, taking the opportunity to run special walks during appropriate city festivals. In developing this role the Friends have been in contact with a number of sister organisations in Australia and elsewhere. Older people who have had a life long interest in horticulture, botany and plants are often an untapped resource for botanical gardens – the guides tend to be in the older age bracket.

In the second part of 2003 the Friends developed a formal course for guides and approximately 20 members have ‘graduated’ from this course held over a period of several weeks. This involves some staff time, giving talks and evaluating potential guides. The consensus is that this has been an excellent move, raising the standard of guiding including both factual information and delivery. What is needed, in addition to training, is a formal contract between the guides and the gardens administration, both to know who is working on a volunteer basis and to satisfy legal requirements under Occupational Safety and Health and Accident Compensation legislation. A system of guides review also needs to be developed.

Where there are approaches by tour companies wanting Gardens based guiding, this can be arranged and is charged for on a bus-load basis or by negotiation with the company involved. However, it is apparent that many self-guided groups go through the Gardens with no formal contact with staff and as a consequence there is no way of knowing the level and accuracy of information given to visitors. It is not unusual for people to come to the information centre and pick up a large quantity of garden maps, clearly with the intention of giving these out to a group visiting the Gardens.

Information centre activity

A fundamental of any botanic garden is information, generally in the form of an ‘information centre’. This is where people come to have questions answered, find out where things are, get ‘un-lost’, and interface with staff. As such the information centre is a vital hub to botanic garden activity and coordination. It also provides an interface between the ‘front of house’ activities that the public sees and the ‘back of house’ activities that are essential but not a public focus.

An important aspect of the information centre should be the ability to directly and efficiently access information for visitors from the gardens plant database, using very simple technology such as tracker-ball ‘point and click’ approaches⁶⁹. It is also important that duty staff are aware of the fundamental pieces of information – where specific collections are located, the position of toilets, opening and closing times, restrictions on activities, permits for special events, etc.

Good information needs to be available at point of entry. This is difficult when, as in the case of Gardens, there are multiple entrance areas. Clearly there is need for information to be available at the Armagh Street car park entrance (and in a more obvious way than at present), as well as at the Rolleston Avenue entrance. This is probably never going to be resolved into a single entrance and it means some duplication of such things as information availability.

⁶⁹ Marrs, R.H. et al 1997: Reconciling plant curation with public access. In: Touchell and K.W. Dixon (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGCI. Pp. 41-44.

All information, without exception, must be of excellent quality especially if botanic garden information is on display boards that have a lot of competing attractions. The old single colour or black and white brochure rarely competes successfully with the multi-coloured one. It may not mean being extravagant – just that the botanic garden brochure must be noticed, picked up and read.

The Gardens needs to ensure that the public are not similarly frustrated. There is a need for access to emergency services, telephones, and staff contacts at all times when the gardens are open to the public. This will become particularly important if operating hours are extended to fit with possible longer hours that may be operated by the Canterbury Museum.

Staffing of the information centre is important. Many botanic gardens make use of volunteers and they can be infectiously passionate which is what the visitor needs. If volunteers (such as the Friends of the Christchurch Botanic Gardens) are used they must be well trained. There is need for a code for front-line staff to be developed. KiwiHost is New Zealand's largest provider of customer service training and provides a certificated means for training. The KiwiHost workshop helps participants to develop positive attitudes to service, improve the way they relate to customers and exceed the expectations of, and create an experience for, their customers.

Interpretation trails

One of the exciting and innovative developments in many overseas botanic gardens in recent years has been that of special interpretation trails. These are self-guided routes through these gardens that link plants and collections that have a common theme but are not growing in the one part of the garden. The trail route needs to be clearly marked; for example, on a map, using colour coded route and plant markers, and often a numbering system for the individual plants which are then replicated in a printed guide that gives the desired information.

One of the attractions of interpretation trails is that they allow a theme to be presented using plants that may have differing ecological requirements and hence may not be well suited to

growing in the one area. Another is that they encourage a feeling of discovery as one moves from one part of the garden to another looking for the next specimen or bed. A third feature is that they help people move through the whole fabric of the botanic gardens and discover a richness of experience that might be missed by just going to selected parts.

Several overseas gardens have good interpretive trails. A good example of the trail concept is provided by the Australian National Botanic Garden in Canberra. Three basic themes have been developed in this botanic garden: taxonomic, ecological and geographic, and horticultural. Within this structure, though, there has been thematic extension through development of an ethno botanical interpretive trail. This popular Aboriginal walk opened in the 1970s and features plants used by Australia's indigenous people⁷⁰. It was developed in consultation with relevant Aboriginal people.

Examples of interpretive trails that might be considered for Christchurch include:

- Plants of cultural value and particular use to humans.
- Rare and endangered plants of the world.
- Botanical history especially in the South Island.
- Major plant families.
- Scented plants (a problem with scented plants in a single garden area is that the scents of different plants can interfere with or mask each other).
- Plants that tell weird stories.

Special interpretation sites

A key issue is that there is virtually no interpretation at present and it is needed urgently for major collections, historic and heritage sites, and as guidance for people visiting the Gardens. On-site interpretation needs to be clear,

⁷⁰ Australian National Botanic Gardens Draft Plan of Management. 2000. Environment Australia.

unambiguous, and visual without being overpowering, accurate and exciting. It should be associated with, and linked to, hard copy materials such as brochures and maps.

One of the issues here is achieving a balance between too little and too much. Either end of the scale becomes frustrating for clients. This is where it is useful to have additional fact sheets available or capable of being generated by computer at an information centre. The person who wants to know more can source additional information.

Displays and exhibitions

Display and exhibition space is integral to an interpretation and awareness programme, and especially when linked to conservation of biodiversity has become a major attraction for many overseas botanic gardens. There is great flexibility in how displays are organised and the length of time that a particular display or exhibition is open to the public.

Most museums, galleries and gardens aim for three levels of exhibition:

- Permanent collections that are relatively static and the 'bread and butter' of the institution – for a botanic gardens these are the permanent garden displays of living plants, both outside and in conservatories.
- Short-rotation exhibitions – for a botanic gardens these will generally be display gardens under cover (for example, Christchurch's displays in the Townend House using begonias, cyclamens, calceolarias, and more), annual beds (for example, those on the Armstrong Lawn), sculpture exhibitions, and information centre displays.
- Long term exhibitions – these are highly publicised and often sponsored displays that may be outside or inside (or a combination) requiring considerable long term planning, publicity and often a paid admission. They may be linked to other garden activities and may also be linked to externally generated events such as cultural and garden festivals.

There are differing levels of risk associated with these various levels of exhibition. The greatest risk is associated with long term exhibitions which are set up as special 'one off' events that are not usually part of the normal operational budget (or may only be partly covered) and so require sponsorship. Their success is measured by a number of indicators of which public attendance and media response are particularly important. Consequently, every long term exhibition has to be a winner in all respects. Far less risk is associated with smaller short-rotation exhibitions that can usually be achieved on a very limited budget, but which get correspondingly less publicity for the botanic gardens.

Displays, where possible should be linked to other activities close to the botanic garden or within it. The location of the Canterbury Museum close to the Gardens should provide excellent opportunities for linked exhibitions and displays. Another level of linkage seen in Frankfurt Botanic Garden, Germany, was a display on bamboo – its variety, uses, and culture. In the adjacent restaurant the menu featured a number of bamboo selections while the exhibition was on.

It is important that exhibition areas are well advertised and can be located readily. There are several placement options – close to eating and retailing facilities, or in the gardens themselves close to relevant collections. An important issue is whether to charge for special exhibitions, something that is very common with art galleries and museums.

Master classes and special lectures/workshops

There is considerable scope for special lectures and master classes to take advantage of visits to Christchurch by notable experts who can articulate well about their skills. At present there is no on-site facility to handle such events, but this needs to be part of the design brief for a new Botanic Gardens building.

One of the first events to be put into place might be an annual lecture series. This should commemorate the great father and son curators of the past – J.F. and J.B. Armstrong. J.F. Armstrong succeeded Enoch Barker (first curator) and as Government Gardiner in charge of the Domain worked on the site for 22 years.

CHRISTCHURCH BOTANIC GARDENS MANAGEMENT PLAN (AUGUST 2007)

- PART IV ISSUES AND ACTION PLAN -

28. Education and Awareness

In addition, an annual master class on a special topic of horticultural interest might be developed in collaboration with other horticultural interests in Christchurch, including the Canterbury Horticultural Society and the Canterbury Branch of the Royal New Zealand Institute of Horticulture. An appropriate name for this might well be the James Young Master Class, recognising the extraordinary service of James Young as curator from 1908 until 1933. Such a master class would usually make use of expertise from outside Christchurch and in many instances New Zealand. This would require an annual expenditure of travel costs and accommodation (plus possibly a stipend) and for this collaborative arrangements with an outside sponsor should be looked at.

As well, the Gardens need to be able to take up opportunities that arise serendipitously as people with expertise and interesting stories visit Christchurch. This will be much easier to action once there is a dedicated facility for the Gardens where such lectures and seminars can be readily held.

Publications and brochures

Publications are a significant part of botanic garden activity. Some gardens have their own publishing units, for example, Royal Botanic Gardens (Kew), Royal Botanic Gardens (Edinburgh), Royal Botanic Gardens (Sydney), Kirstenbosch Botanic Gardens, Singapore Botanic Gardens, Missouri Botanical Garden. For smaller gardens, this activity is usually contracted out or carried out with a publisher on a partnership basis.

Examples of publications include:

- Gardens maps and fold-out guides.
- Temporary display guides.
- Catalogues and commentaries on larger exhibitions especially where these are of a longer term nature.
- More extensive booklet guides to the Gardens and their displays.
- Books that comprehensively write about and illustrate garden displays and history.

- Scientific publications – monographs and papers submitted to science and other journals.
- Media articles publicising the Gardens, and their activities and products.
- Gardens journal numbers on a regular basis especially where there is significant original scientific activity.
- Copies of talks and lectures, lecture series and course results.
- Magazines about the Gardens and featuring articles for the public on general topics related to botanic garden activities.
- Annual reports, strategic plans and reports for various interest groups.
- CD-room, DVD and video productions related to horticulture, gardening, botany and conservation.
- Website available information, articles and reprints.

Publication product	Time-priority
Gardens' maps and fold-out guides and temporary display guides.	On-going
Annual reports, strategic plans and reports for various interest groups.	On-going
Media articles publicising the Gardens, and its activities and products, including a regular newspaper column.	On-going
Website available information, articles and reprints.	On-going
A numbered publication series – research, talks and lectures, lecture series	Medium term
A more comprehensive, commercial publication on the Gardens, its collections, and history	Long term
Catalogues and commentaries on larger exhibitions especially where these are of a longer term nature.	Long term
CD-room, DVD and video productions related to horticulture, gardening, botany and conservation;	Long term

A specific need for Gardens is for a good book that both is a comprehensive account of the garden and its collections, including its history and regional significance. Both Wellington and Dunedin have produced very comprehensive books that cover their gardens history, and a comparable book for Christchurch is needed well before its 150th anniversary. A better model than either of these is probably the Singapore Botanic Gardens publication that doubles as an excellent soft cover guide to these gardens and a short history of the gardens.

Horticultural trainees and apprenticeship programmes

There has been a long history of apprentice training within the Gardens and currently five trainee positions are part of the staff of the Gardens.

Training is based currently on NZQA Level 4, involving on the job training, and correspondence through the Open Polytechnic. There is a commitment to continue with the ongoing training of not only trainees, but also staff to maintain currency of educational and industry learning.

School education programmes

Formal education takes place in planned ways at recognised institutions, as part of a curriculum-guided approach. It is also important to recognise that the Gardens needs to maintain a flexible approach to how it handles requests for assistance with school visits. Not all visits will be done through such programmes as LEOTC, and indeed a significant number of visits by school classes seem to be based on 'word of mouth' recommendations.

Overall, the Council offers a number of hands-on experientially based environmental education programmes at its regional parks. These programmes involve students interacting with some of Christchurch's 'wilder' parks from the Estuary and wetlands to the Port Hills. Experienced staff co-ordinate and run these programmes for primary, intermediate and secondary schools. These programmes are linked to the curriculum and *The Guidelines for Environmental Education in New Zealand Schools* and encourage schools to consider how they can be involved in positive action for the

environment. Schools can select from a range of experiences and sites including:

- Streams, rivers and wetlands.
- Estuary, beach and shore habitats.
- Biodiversity and geology.
- City water and waste.
- Heritage and history.

Classes are currently run by the Curator's House tenants who have adopted The Natural Step approach to environmental stewardship. As an environmental stewardship philosophy is at the heart of the establishment of the Curator's House Restaurant, engagement with The Natural Step has been a natural progression for the business. The Natural Step added to the existing philosophy by providing a directed framework on which the company could expand its environmental objectives into long term sustainability objectives. In the words of the tenants:

"This relationship with the Botanic Gardens [seeking an environmental approach] means that staff of the Botanic Gardens are involved in the day to day running of the restaurant site, through the establishment and maintenance of the gardens. It also means that the restaurant garden is primarily an open public demonstration (mostly organic) garden for the enjoyment and education of visitors to the Botanic Gardens, as well as restaurant customers."

The environmental philosophy of the business is demonstrated through integrating an organic garden into the cuisine and design of the restaurant and through the commitment of the tenants to eco-education of visitors, diners and interested groups by providing information.

Other adjacent institutions, such as the Canterbury Museum and the Christchurch Art Gallery, offer education programmes. The Canterbury Museum offers a wide range of learning experiences to groups of all ages and sizes, with education programmes tailored to suit a variety of needs from kindergarten and play centre through

primary to secondary school, from English language schools to senior citizen groups.

At the Christchurch Art Gallery lessons and activities, teacher previews and new resources are developed for their changing exhibition programme. This includes illustrated worksheets and materials, and a range of lessons that promote the development of essential communication, social and cooperative skills.

There have also been approaches to the Council by other groups to run more extensive classes. One of these is the Canterbury Horticultural Society (CHS) who operates a Garden School programme that teaches horticultural skills to members of the public⁷¹. There is need at the Gardens to resolve long standing discussions with the CHS and other interest groups and to make decisions on whether classes should be run within the Gardens, who takes responsibility if they are, and how standards and evaluation are to be covered.

Training in home garden techniques

The Canterbury Horticultural Society has a long standing tradition of training and practical demonstrations, and in the past these have included such events as rose pruning demonstrations in the Gardens.

The Curator's House Restaurant has a concession in the Gardens. In addition to the strong environmental focus in the operation of the restaurant, the Curator's House Restaurant also aims to be environmental leaders by passing on their knowledge and experience to diners and visitors by providing education programmes and information services. The aim is to have eco-education as the primary focus of the business, with the restaurant providing the financial base to support this work.

In the first year of the business the Curator's House Restaurant ran, in conjunction with the Environment Centre and the Edible Gardens Project, a five day school holiday programme called 'Kids Edible Gardens. This was a hands-on programme involving children in the experience of the entire natural processes involved in

producing food. From this they gained an understanding of the natural cycles and services provided by nature and the importance of healthy soils and plants contributing to healthy people. The restaurant garden is also used as a resource by Gardens staff when showing groups through the gardens.

Other ways of providing information to diners and garden visitors is through the use of signs throughout the Gardens, including signs on the waste decomposition processes; that is, worm farm, compost and bokashi buckets. The restaurant garden has a summer house which, as well as being used for garden dining, is also used to host talks, and it has a blackboard which lists current activities in the garden.

While the busy spring/summer catering season has meant a reduced ability to offer experiential training workshop-type programmes, with the assistance of a dedicated staff member of the Gardens, the signage and information on the activities of the restaurant garden has been maintained.

Informal education

A review article comment in the context of Australia that, "before the appointment of professional teachers, education in botanic gardens was largely a passive process relying on the plants themselves and simple labelling"⁷². Sometimes this was supplemented by simple leaflets. In contrast increasing technology linked to greater understanding of how people at various ages learn provides many opportunities for innovative development of resources.

One of the simplest devices is the development of discovery trails that can provide a combination of interpretive information and self-discovery. Examples of such trails can involve threatened species, botanical exploration, traditional use of plants, different plant families, adaptations of plant parts for pollination and dispersal by different vectors. Apart from allowing one to grow specimens in an ecological fashion, it also means that trails are a way of introducing those

⁷¹ See <http://www.gardeninfo.org.nz/school/>.

⁷² Boden and Boden 1987.

who use them to the wider garden, encouraging further visits.

Alongside this, thematic indoor displays play an important educational role especially when students are given worksheets to complete on the basis of the displays. Where there are appropriate educational rooms students can be encouraged to carry out simple experimental work. An example from the National Botanic Garden in Canberra, Australia, is based on a display entitled "Bushfire" – students discover the relationship between fire and the Australian flora by igniting *Banksia* seed cones to observe their heat-induced dehiscence, and also simulate fire-effects on germination using *Acacia*⁷³.

Informal education is an activity that can be facilitated also by cultural events in the botanic garden that bring people face to face with plants. The Chelsea Physic Garden offers a week long People and Plants Week with the cultural use of plants as a focus⁷⁴. The approach, in this particular instance, is directed towards children, based on tactile and spoken expression rather than what is written and, "the plants themselves become maps for language".

The production by the Gardens of its school holiday programme needs to continue, as trails, maps and interactive attractions for school aged children provide opportunities to encourage environmental learning as well as the exploration of the gardens and environment.

Community involvement

The Gardens in Christchurch are intended to be for all people and hence for the whole community of the city and our visitors. They therefore should reflect this community in their layout, activities, collections, and programmes. As a local body Garden there is a requirement to consult with the community under the Local Government Act, although it is Council who make final decisions.

There is already some community involvement at a range of levels, some through the Friends

⁷³ Boden and Boden 1987.

⁷⁴ Dawn Sanders 1997: Cultural botany: maps for language. In, Touchell and K.W. Dixon (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGCI. Pp. 333-334.

organisation, some through local politicians, some through schools and tertiary institutions, and some through interested individuals. However, there is much room for innovative and increased involvement of people – both from sectors of society that seem to be under-represented as visitors (for example, local Asian and Polynesian people), and also by working more closely with parallel organisations such as the Addington Bush Trust that has now given rise to the New Zealand Restoration Trust and the Riccarton Bush Trust.

Cultural aspects of interpretation and awareness

Christchurch is increasingly a city of mixed cultures and demography. The city's own studies of demographic and cultural patterns are revealing. Some key indicators are:

- Females outnumber males by about 12,000 with 61% of residents over 70 years of age being female.
- The median age of for the city is increasing and by 2021 is expected to reach 41.6 years with almost 20% over 65.
- From 2016 the elderly will outnumber children.
- Between 1991 and 2001 the Maori ethnic group increased by 43% and the resident Asian population trebled.
- About 18% of residents were born overseas.
- 10% of Christchurch people can converse in a non-English language.

With respect to the Asian population of Christchurch in 2001 the 17,500 residents made up 5% of Christchurch's total population, very close to the New Zealand wide mean. This percentage can be expected to rise.

What this means is that the Gardens needs to be culturally sensitive, as well as providing for a female-skewed ageing population. This has implications for collections, access (for example, provision of paved paths), interest of visitors in particular topics, classes and interpretation. Yet, it also potentially may provide a wide range of support that is at present not accessed.

Interpretation and awareness for disadvantaged

Access and interpretation for the disadvantaged is important, especially when the proximity to Christchurch Hospital is considered⁷⁵. Although many botanic gardens around the world have developed excellent facilities for the disadvantaged too often there are major impediments to access and certainly interpretation and awareness for the disadvantaged is not good.

One point is ensuring that the physically disadvantaged, such as those with wheel chair needs, can access information centres and exhibitions and important collection areas. Another is to ensure that the Gardens are a positive experience for the mentally disadvantaged as well. This requires a different level of interpretation and display to be considered.

An important consideration is provision of path surfaces that can be accessed by those who are disadvantaged. This includes ensuring wheelchair access to major parts of the gardens, assistance in the form of rails and step guides for the visually impaired, and separation as much as possible of pedestrian and service traffic. Signage should take account of visual needs; for example, important detail being in Braille.

The relationship to the hospital is especially important. As the present time there is very limited access for those with walking disabilities to the adjacent Gardens and Hagley Park. Yet, the Gardens and the Park provide a green area that should be regarded as a therapeutic facility. This means developing a seamless approach to management and wheelchair accessible walkways that can be used from the hospital site.

Availability of resources in the gardens in all seasons

Christchurch's climate is not always predictable and has a relatively long period of winter when outdoor education can be difficult. A current problem is the absence of a dedicated classroom, and the relatively large area of the gardens that means education groups can be readily caught by

⁷⁵ Given, D.R. February 2004: *Preliminary concepts for development of the southern portion of the Gardens*. Report to A. Greenup.

sudden changes in weather in distant parts of the garden. The native plant section, in particular, is several minutes walk from any buildings where shelter can be taken. This is noted because conservation of native plants is likely to be a high demand education programme.

To develop an all-year, all-weather programme it will be necessary for the botanic gardens to develop a dedicated classroom with lecture and audio-visual facilities and at least some interactive space. With redevelopment of the Gardens buildings this is a role that the present Information Centre might be used for with information being shifted to a larger building complex. Yet, additionally, the Gardens requires a further shelter area in the native plant/Cockayne Garden area. This could be something quite simple – possibly an open sided pole-walled shelter in some instances.

Training educators

Botanic gardens are moving into not just being a venue for education programmes run from outside the garden, but also for training educators. Teachers are not always well prepared to teach botanical and environmental issues especially in the context of a botanic garden⁷⁶. Workshops and courses can provide an overall view of the most important aspects of flora and vegetation, their inter-relationships with the environment and the issues involved in sustainable management. It is also important to ensure that teachers intending to use the Gardens are familiar with facilities as an education resource, have a general knowledge of what parts of the plant kingdom are included in the Gardens' collections, are known to staff, and are familiar with and supportive of the mission and objectives of the Gardens.

Training the educators will be a special challenge for the Gardens. At least the Gardens must ensure that educators are well informed about and aware of the richness and scope of the Gardens collections. It is also important that the right messages are transmitted, concordant with the aims and objectives, and fundamental philosophy

⁷⁶ Navarro, B. 1987: The botanic garden as a vehicle for environmental education. In, Bramwell, D., O. Hamann, V. Heywood and H. Synge (eds.), *Botanic Gardens and the World Conservation Strategy*. Academic. Pp. 59-65.

of the Gardens. There is no obvious solution to this issue – in terms of guaranteeing that the messages are always the right ones – and it will need to be probed and developed through discussion with education providers along with trial schemes.

Educational outcomes are developed from Environmental Education in Botanic Gardens guidelines for developing individual strategies (BGCI 1994).

An education strategy

Goal 20: *To assist the public in their experience and understanding of the plant world and environmental issues.*

Action 20.1: Develop an environmental education strategy that states what needs to be accomplished, how we plan to achieve it, identify the attitudes, behaviour and social change to be encouraged and identify and prioritise the target groups, conservation messages, sustainability and development issues to be addressed and facilities and resources needed.

Action 20.2: Establish strong marketing and communication skills within the Gardens to support effective communication with the community about our mission, and to seek to influence a broad target audience.

Goal 21: *To offer a broad range of botanical, horticultural and environmental education through both structured programmes and informal learning.*

Action 21.1: Develop environmental education and sustainability by having well planned environmental education programmes with appropriate resources allocated.

Action 21.2: Use appropriately qualified professional education staff and explore the establishment of educational section within the Gardens.

Action 21.3: Ensure that programmes are flexible, taking into consideration different cultural and community values.

Action 21.4: Develop and promote the Gardens as a centre for environmental education to schools and learning institutes.

Action 21.5: Develop and implement a range of activities, using a variety of techniques, which target a broad audience and convey messages that not only reach those who visit the Gardens, but the whole community including non-traditional botanic garden users.

Action 21.6: Use programmes to raise awareness of their role in providing a sanctuary/refuge in urban areas and support local communities to 'green' their neighbourhoods.

Goal 22: *To encourage greater local and international use and experience of the Gardens aesthetic, educational, scientific, and cultural qualities.*

Action 22.1: Develop child-friendly policies and train staff in these policies and conduct regular audits to ensure that the garden is 'child friendly'; for example, access points, eating areas, storage areas, shelter and activity/play areas.

Action 22.2: Deliver curriculum based programmes in environmental education within the Gardens.

Action: 22.3: Identify themed programmes and activities are relevant to local and regional environment and conservation issues.

Action: 22.4: Offer a variety of informal education opportunities that complement the Gardens mission and target a broad audience with diverse interests using holistic and experientially based techniques that aim to achieve practical outcomes.

Action: 22.5: Evaluate the techniques used in the visitor, interpretive and educational services to ensure that they are effective in achieving their objective.

Goal 23: *To develop, encourage and support environmental education within the gardens.*

Action 23.1: Support education delivery in line with Gardens education strategy, by external providers, and the Friends of the Gardens.

Action 23.2: Develop self guided trails and walks including specifically targeted audiences.

Action 23.3: Support environmental education by commercial users in promoting conservation values.

Action 23.4: Interpretation should be compatible with and reflect the *ethos* of the Gardens, as far as possible enhancing and being enhanced by the setting that the Gardens provide.

Action 23.5: Major display areas should be labelled clearly with simple interpretation of their significance, including not just 'botanical' collections but also areas such as the herbaceous border, and explaining succinctly what these are and

why they is important, perhaps with pamphlets available on site providing hints on how to create one's own similar garden.

Action 23.6: There is need for a formal contract between the guides and the Gardens administration, both to know who is working on a volunteer basis and to satisfy legal requirements under Occupational Safety and Health and Accident Compensation legislation; this should include a periodic review of guides.

Action 23.7: The role of roving guides and interpreters in the Gardens might be assessed on a pilot-scheme basis initially, and might also be on a seasonal basis, for example, during the summer and school holiday periods.

Action 23.8: Development of interpretation plan for the Gardens.

Action 23.9: Development of lectures and master-classes to take advantage of visits to Christchurch by notable experts who can articulate well about their skills; this needs an on-site facility to handle such events, and is part of the design brief for a new Gardens building.

Action 23.10: Development of an annual lecture series that might well commemorate the great father and son curators of the past – J.F. and J.B. Armstrong.

Action 23.11: Development of closer working relationships with affiliated societies and institutions, in delivering environmental, botanical and horticultural knowledge.

Action 23.12: Development of a publication strategy.

29. NETWORKING AND COMMUNICATION

Explanation:

“Networking and communication” involves fostering inter-relationships.

Objective:

Networking and communication will be facilitated between the Gardens and other teams within the Council, with related institutions and professional organisations (including the taking up membership, where appropriate), and with the public and stakeholders.

The importance of networks and communication

Communication is a vital process by which two or more parties exchange information and share meaning. It is not just about facts – it also involves emotions, attitudes, vision and beliefs⁷⁷. Essential to networking and communication is sharing, common understanding, information, ideas, skills and resources.

Some of the network places and stakeholders that a botanic gardens can communicate and network with are:

- Within the Gardens.
- With administrators and governance.
- The public and other clients.
- The horticultural industry, plant suppliers and landscapers.
- Other botanic gardens and botanic garden organisations.
- Educators, scientists, survey organisations and libraries.
- Government and enforcement agencies.

⁷⁷ Dimpleby, R. and G. Burton 1998. *More than Words. An introduction to Communication*. Routledge. 3 ed.

- Sectors, such as tourism and marketing.

Good communication and networking leads to achieving coordinated action, sharing ideas and information on organisational goals, meeting task directives, obtaining results from efforts made and decision making, and expression of emotions. Within the range of networking and communication that is undertaken in a botanic garden, all three primary communication methods (written, oral and non-verbal) has its particular place.

Communication networks link individuals and groups. They help to structure information flow and content, and make information and ideas available to wider, often non-target, audiences. Networks also shape messages to fit a diverse range of audiences. Communication, networks and partnerships are an important part of the operation of a botanic garden. As an example, the Strategic Plan of the Royal Tasmanian Botanical Gardens, Hobart, typifies the needs⁷⁸:

Partnerships between Government organisations, including the three levels of government, learning / science institutions and industry, are an important priority for the State Government. While the RTBG has a number of formal and informal partnerships and strategic alliances in place, it recognises the need to actively seek and successfully establish new partnerships to enhance the effectiveness of its programs and resourcing, and to be of mutual benefit for other organisations involved. Some of the key areas to be targeted include plant conservation and research, school and community education, workplace training, volunteers, business enterprise, plant collections and interpretation.

General issues for Gardens

Good communication brings to people’s attention the existence of the Gardens. It helps ensure that information on the Gardens is accurate. It encourages interchange of ideas, views and developments between the Gardens and

⁷⁸ Strategic Plan 2003-2007, Royal Tasmanian Botanical Gardens, Hobart

stakeholders. It allows the Gardens to respond positively to suggestions and criticism.

Dedicated networks for botanic gardens in New Zealand are only just starting to develop. A formal network for botanic gardens has been set up and Botanic Gardens of Australia and New Zealand (BGANZ) is now incorporated⁷⁹. New Zealand also has a relatively new Plant Conservation Network (NZPCN)⁸⁰ that provides excellent links within the botanical and conservation communities. The Royal New Zealand Institute of Horticulture (RNZIH)⁸¹ also provides good links, especially through its website and its New Zealand Garden Trust.

At the international level, the Gardens is a member of Botanic Gardens Conservation International (BGCI)⁸², which is based in the United Kingdom and now constitutes a major umbrella for botanic gardens internationally.

Links with allied outside organisations are essential for both the efficient running of the Gardens and to allow it to reach its full potential. Linkages need to be nurtured and in some instances this may lead to an exchange of letters or a Memorandum of Understanding. Important linkages apart from those already mentioned include:

- Other units in the Christchurch City Council.
- Educational institutions, including schools.
- The horticultural industry.
- Government agencies, including MAF Biosecurity and ERMA⁸³.
- Environment Canterbury.
- The tourism industry.
- Friends of the Gardens.

- Neighbours and neighbourhood associations, including Cultural Precinct partners.

- Concessionaires, and both licensed and casual operators.

The Gardens has membership of the following organisations:

- Alpine Garden Society (UK).
- Australian Network for Plant Conservation.
- Australian Orchid Review.
- BioGro New Zealand.
- Botanic Gardens Conservation International.
- Botanical Society of South Africa.
- Cactus and Succulent Society of America.
- Canterbury Botanical Society (NZ).
- Interpretation Australia Association.
- New Zealand Geographic.
- New Zealand Botanical Society.
- New Zealand Native Orchid Group.
- New Zealand Nursery Register.
- Organic New Zealand.
- Plant Talk (UK).
- The Plantsman (UK).
- Royal Forest and Bird Protection Society of New Zealand.
- The Royal Society of New Zealand.
- Succulent Society of South Africa.
- Weekend Gardener.

⁷⁹ See under <http://www.anbg.gov.au/chabg/>

⁸⁰ <http://www.nzpcn.org.nz/>

⁸¹ <http://www.rnzih.org.nz/>

⁸² <http://www.bgci.org/>

⁸³ Environmental Risk Management Authority New Zealand

Public and community perceptions

Little was raised by the public in surveys.

Special issues

The 'shop-front' function of the Gardens

The 'shop-front' aspect of the Gardens offers many possibilities for innovative development. As a major New Zealand botanic garden, it needs to ensure that it is in the forefront. An important tool to achieve this is a high quality website that becomes the definitive source for information on the Gardens. Existing information on the Gardens on other independent websites is of variable quality and may even be erroneous. The Gardens needs to facilitate the dissemination of high quality information.

The Gardens should also be a 'shop-front' for other green spaces and parks, natural habitat areas, other garden collections (including private ones), and national parks and reserves of the eastern South Island region. This means it also has a role as a starting point for allied experiences elsewhere that enrich the initial botanic garden experience.

The Gardens are designated as an education centre for biodiversity education in the draft Biodiversity Strategy for Christchurch. This provides an excellent opportunity to develop a role for the Gardens that promotes Christchurch as an ecologically interesting, biodiversity-rich and sustainably managed City. Annual resident, and parks, surveys can provide customer feedback on whether of not expectations are being met and be a measure of the Gardens communication effectiveness.

Web-based communication

Pages on the Council web-site are dedicated to the Gardens and represent an invaluable resource to share up-to-date information on the Gardens. These can be enhanced. Two way communication/feedback between the Council and the public can be further facilitated with a link on these pages to an online enquiry/comments form.

Although the internet is increasingly a source of information for many people there are equally many who do not use it. Therefore, it is recognised that it is important that other forums for the sharing of information, such as newsletters, newspaper articles, signs and notice boards, continue to be utilised.

Working with support groups, neighbours, stakeholders and the public

The Gardens key support group is the Friends of the Christchurch Botanic Gardens, Inc. Regular close contact and working together with this group is essential. The Friends have a number of important roles, including provision of specialist volunteers for activities, such as guiding. They also have a support role and, along with staff and administrators, are guardians of the vision for the Gardens.

The overall concept of City Council/volunteer agreements is under discussion. One of the issues with this is the implication of legal requirements with respect to Occupational Safety and Health. Regular liaison is maintained between Gardens staff and the Friends executive, but this requires regular monitoring and review.

A vital area of communication is with Gardens' neighbours and with the general public, among whom there will be a range of influential stakeholders. In reality, every citizen in Christchurch is a stakeholder to the Gardens, in its capacity as a significant metropolitan open space area, and this can be all too easily overlooked at times. A special set of stakeholders are those that exercise statutory rights with respect to the Gardens. These include:

- Department of Conservation (Reserves Act).
- New Zealand Historic Places Historic Places Trust (Historic Places Act).
- Ngāi Tahu (Ngāi Tahu Settlement Act).
- Environment Canterbury (for example, pest control legislation).

It is also critical for there to be effective communication with immediate neighbours to, and occupiers (including lessees) of, the Gardens, and there needs to be a regular system of meetings and contact points with these. Gardens management must always be ready to respond, if the matter is a complaint or problem, a boundary issue, a request to address a meeting, or a call to work on a common policy.

Ngāi Tahu (and other Maori) linkages and communication

Links with Ngāi Tahu⁸⁴ are through the Council's administrative structure. Submissions on city strategies and plans, for example, the draft Biodiversity Strategy, have indicated considerable interest in a wide range of matters, including the use of names, and recognition of *taonga* and *mahinga kai*. The city recognises the need to have regard for Maori as an official language, as well as the implications of the Ngāi Tahu Settlement Act 1998 in relation to place names. It also notes that the Council has legal and moral obligations to incorporate Maori language and perspectives in its written material, whenever appropriate⁸⁵. Maori connections with the land and with indigenous biodiversity need prominence. There are also aspects of collections, science, conservation and tourism that must be related. The presence of the Avon River framing the Gardens setting is especially important. Sensitivity and obligation demands increasingly good linkages with the *tangata whenua*.

The Gardens has an extensive range of plant material in its collections and much of this derives from outside the Canterbury Region. There will, therefore, need to be development of linkages with other *rūnunga* and *iwi*. An example is the need to engage with Hokotehi Moriori Trust, with regard to collections of Chatham Islands flora, as a priority.

Botanical and horticultural organisations

Ongoing liaison with specialist garden societies is highly desirable for particular groups of plants. Some plants grown by the Gardens may require

maintenance or propagation skills in short supply among current staff. The liaison also provides opportunities for exchange of material and especially of species and cultivars that may otherwise be difficult to procure. Specialist societies can also assist with collection assessment. Outcomes of such linkages include both collection acquisition and the use of volunteer expertise in Garden operations.

Within Christchurch, important links need to be maintained with organisations, such as the Canterbury Horticultural Society and the Christchurch Beautifying Association. An interesting historical link with the latter is the mutual connection with Leonard Cockayne, who was instrumental in setting up the Association and is also prominently commemorated in the Gardens.

The Gardens needs to scope its industry linkages, recognising that there is considerable opportunity to showcase New Zealand horticulture, especially that of Canterbury. Discussion with wholesale and retail nurseries that are engaged in plant breeding and introduction of new cultivars and species to the market has indicated considerable interest in closer contact, including the potential trialling of pre-release plant material.

Recent issues concerning biosecurity, and the importation of plants and plant materials, indicate the need for more co-ordinated communication channels for the horticultural industry and botanic gardens. The Gardens subscribe to some industry newsletters and journals, but could well play a much more active role with industry groups.

National and international networking and communication

New Zealand has not had, until very recently, a national network of botanic gardens. The emergence of Botanic Gardens of Australia and New Zealand (BGANZ) now provides such a forum. The official launching of BGANZ was in Hobart in October 2005. The role of BGANZ is to:

1. Provide a national forum for information exchange and coordinated planning, and to foster best practice standards among Australian botanic gardens.

⁸⁴ <http://www.ngaitahu.iwi.nz/Home>

⁸⁵ For example, Christchurch City Council *in-house guidelines* 2003. *In Style*. Christchurch City Council writing guidelines.

2. Be an advocate for the interests of Australian botanic gardens and influence policy and legislation affecting botanic gardens nationally and internationally.
3. Identify funding opportunities and seek increased resources for botanic gardens.
4. Advocate plant conservation, and foster botanical and horticultural science.
5. Facilitate career opportunities for, and provide grants to, botanic gardens professionals to improve their skills and benefit their gardens.
6. Coordinate national conferences, exhibitions and visitor programs related to public gardens, plant conservation and botanical science.
7. Build and maintain links with relevant national bodies.

Within New Zealand, there is also liaison with the New Zealand Plant Conservation Network (NZPCN). The New Zealand Plant Conservation Network was established in 2003 with the vision that:

“no indigenous species of plant will become extinct nor be placed at risk of extinction as a result of human action or indifference, and that the rich, diverse and unique plant life of New Zealand will be recognised, cherished and restored”⁸⁶.

The objective is that members of the Network will collaborate to protect and restore New Zealand’s indigenous plant life and their natural habitats and associated species.

There are opportunities for the Gardens to network with other national groups, especially in the areas of education and the horticultural trade. Such linkages should be seen to have clear benefits for the Gardens. There are also good opportunities to establish regular links with secondary botanic gardens (for example, Timaru Botanic Gardens) and with local authority parks and reserves departments, especially in other parts of the South Island. These open space managers

may not want to label their green spaces as ‘botanic gardens’, but often have an interest in creating a more botanical role for them.

A networking and communication strategy framework

Goal 24: *The Gardens will be a major provider of high quality information and an efficient and high quality communication link.*

Action 24.1: A ‘shop front’ role will continue to be developed, including being a focal point for the Christchurch Biodiversity Strategy, horticultural and urban ecology issues, and associated environmental and conservation issues.

Action 24.2: High quality pages on the Christchurch City Council’s website will be the definitive source of up to date information on the Gardens.

Action 24.3: Development of appropriate activities in the Gardens, such as high profile public lecture series, workshops and conferences to bring key issues concerning botanic garden interests to the public and stakeholders, will be scoped.

⁸⁶ <http://www.nzpcn.org.nz/>

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Goal 25: *Effective and regular communications will be established with stakeholders and organisations that share the Gardens vision or are engaged in related activities.*

Action 25.1: The special relationship between the Friends of the Christchurch Botanic Gardens Incorporated and the Botanical Services Operations Team is recognised and the need for positive and regular interaction, along with fostering the role of volunteers in the Gardens through the Friends' organisation.

Action 25.2: Horticultural industry linkages will be scoped, and active communication developed, in the Gardens, recognising that there is considerable opportunity to showcase New Zealand (and especially Canterbury) horticulture.

Action 25.3: The particular place and role of Ngāi Tahu will be recognised and fostered, and, as required, communication will be facilitated with other *rununga* and *iwi*.

Action 25.4: Good, regular communications will be maintained with the general public and a range of influential stakeholders (including those that have statutory rights), neighbours and lessees.

Action 25.5: Linkages will be developed, as appropriate, with other organisations that can advance the objectives of the Gardens, including tourism, education, research, marketing and funding.

Goal 26: *Opportunities for networking with other botanic gardens, nationally and internationally, will be sought and developed.*

Action 26.1: The Gardens will support regional and national networks directly concerned with its mission, especially Botanic Gardens of Australia and New Zealand (BGANZ), the New Zealand Plant Conservation Network (NZPCN) and the Royal New Zealand Institute of Horticulture (RNZIH).

Action 26.2: Effective international botanic garden networking will be developed, including having membership of key organisations, such as Botanic Gardens Conservation International (BGCI) and the International Association of Botanic Gardens (IABG), along with more informal networking with selected overseas botanic gardens and related institutions.

Action 26.3: Encouragement will be given, as resources allow, to strategic conference attendance and for staff taking up appropriate positions of responsibility with network organisations.

Action 26.6: Networking with other South Island botanic gardens and local authority parks and reserves department will be developed on an informal basis, initially, but more formally if the situation is appropriate.

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29. Networking and Communication

Table 29.1: Networking and communication activity (development / action) priority chart

	More urgent		Less urgent	
	More important	Less Important	More important	Less Important
Cannot be done or completed within existing budget – major capital or operational item	<ul style="list-style-type: none"> ▪ Redevelopment of website pages 		<ul style="list-style-type: none"> ▪ Scoping lecture series ▪ Conference support 	<ul style="list-style-type: none"> ▪ Scoping publication series
Can be done within existing budget – may often involve attitudinal change	<ul style="list-style-type: none"> ▪ A ‘shop front’ role ▪ Good Ngāi Tahu links ▪ Scoping industry links ▪ Formalise Friends links 		<ul style="list-style-type: none"> ▪ Parks department linkages 	

30. RESEARCH

Explanation:

“Research” is about learning about plants in the Gardens collections and their propagation.

Objective:

Support will be given to appropriate horticultural and scientific research that contributes to the achievement of the goals and objectives of the Gardens, is operational in output and accords with City Council priorities. Key partnerships with the Gardens will be sought to facilitate this.

The importance of botanic gardens research

Should a botanic garden do research? To many people, research might seem to be an unnecessary add-on. However, research is quite basic to the idea of a botanic garden, to the extent that some major city funded gardens will not call themselves ‘botanical’ because they have no research function. For gardens, such as the Royal Botanic Gardens at Kew, England, and the Missouri Botanical Garden in St Louis, USA, research is perhaps the primary function. For others, it is one of several important functions.

When looking at the role of botanic gardens staff, there are often unrecognised elements that are properly within the realm of ‘research’. Conducting trials of new plants to determine their local use is an example. Another is maintaining records of the effects of storms and other disturbance events. Another is investigation into the historical development of a garden and its heritage.

The development of large scale research facilities such as those at the Royal Botanic Gardens (Kew), Kirstenbosch Botanical Garden, Missouri Botanical Garden and the Copenhagen Botanic Gardens, may be quite inappropriate for most botanic gardens. Yet, many other botanic gardens have developed more modest research programmes, and they provide a location where research can be done. This is especially important as it is increasingly recognised that one of the most important areas of research today is the

study of urban environments where seventy five percent of the world’s population live.

Examples of botanic garden research include:

- Plant classification and identification guides.
- Genetic study, especially of cultivated plants and including breeding trials.
- Restoration and maintenance of urban wildlife habitat.
- Invasive species – their identification, ecology and control.
- Pollination and seed biology; especially in human made environments.
- Determining optimum garden conditions for cultivated plants.
- The effects of urban stress, including pollution on plants.

There is no one pathway or model for research. However, all botanic gardens should assess their research potential and seek a programme appropriate to size, resources, partnerships and local needs. The International Agenda for Botanic Gardens in Conservation⁸⁷ provides a useful checklist. It suggests that botanic gardens should:

- Identify their current and future activities and priorities in botanical research, in particular highlighting those activities that can contribute to biodiversity conservation and its sustainable use.
- Disseminate information derived from research programmes to support biodiversity conservation, including making it available to governments, decision makers, scientists, conservation practitioners, land managers, other users and the general public to support conservation and sustainable use programmes through a variety of ways, including use of publications.

⁸⁷ <http://www.bgci.org/index.php?id=73>

- Collaborate with others in the development and implementation of research programmes, both nationally and internationally.
- Seek to raise awareness amongst the general public of the importance of research undertaken on plants.
- Give special attention to undertaking research on the plants, habitats and vegetation of the local region the botanic garden is in and of the socio-ecological and cultural aspects and uses of these.
- Undertake research, where appropriate, on the biological and physical processes that impact on biological diversity, especially in the local region, including research on reduced biodiversity due to invasive species, change in land use, climate and pollution.
- Include researchers in the botanic gardens staff team, where possible, and work to integrate their activities fully with the priorities and other activities of the organisation responsible for the botanic gardens.
- Help to ensure that the results of scientific, and other forms of, research that is undertaken by, and within, botanic gardens are used to develop or support methods for conservation and sustainable use of biodiversity.

General research issues for the Gardens

Strong research functions were not developed as part of the early evolution of botanic gardens in New Zealand, with the exception of Wellington, where Sir James Hector had a joint role with the Colonial Museum, the Botanic Gardens and the New Zealand Institute (later the Royal Society of New Zealand). In the case of Christchurch, the second curator, John Armstrong, undertook considerable botanical exploration and study of native plants, established a herbarium and trialled exotic plants. The Acclimatisation Society used an area in the woodland area of North Hagley Park between the Avon River and the hospital for trials of exotic species prior to release.

As time progressed, lack of vigorous science in botanic gardens in New Zealand, combined with the formation of the Department of Scientific and Industrial Research after the First World War, meant that New Zealand botanic gardens have followed a different evolutionary path from many botanic gardens in other countries.

There are three kinds of research that could be suggested for the Gardens:

- Secondary research - for example, into historical documents in order to produce a clearer picture of how the Gardens have evolved and changed over the passing decades.
- 'Blue skies' research, where the main motive is to discover without any application in mind - this usually means establishing as a major research provider.
- Mission-oriented research that has applied practical outcomes - this will often be done either collaboratively in partnership or through subcontracting.

The third of these choices seems to be most appropriate for the Gardens. A useful research programme can be built through partnerships, recognising that, increasingly, funding agencies are wanting research projects to include end-user partnerships.

The Gardens has undertaken activities that have a legitimate research component, although this has not been recognised as research. This includes pre-release trials on new cultivars, assessing the performance of plants in the garden environment, assessing tree health and performance, and recording and analysing visitor data.

The Gardens can readily move into a modest level of research activity. There are, though, important research problems, both within and adjacent to the Gardens. Some of these have been identified in the review process of the Gardens and others have emerged during the development of a draft agenda for research by an Urban Ecology Forum set up between Lincoln University, Environment Canterbury and the Christchurch City Council. Examples of potential research projects are listed in Table 30.1.

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30. Research

Table 30.1: Potential research projects

Research area	Current capacity	Comments
Trials of cultivars for regional suitability.	Good and can be done with little financial input.	Already in effect being done with some plant groups, such as roses.
Smoke germination of seeds.	None, but would not be difficult to set up equipment needed or to collaborate in this with other institutions.	Opportunity to collaborate with University/Landcare Research Marsden research, and input into Chatham Islands Marsden research; also overseas collaboration.
Disease and pests of trees in urban environments, especially in relation to stress.	Some data already; could be incorporated into asset management.	Area in which there seems little data, especially on transfer of diseases and pests between species.
Study of the insect fauna of native plants, such as mites and whiteflies.	None, but has been suggested as a student project. Initially.	An underdeveloped field of study that emerged as a suggestion from the BioBlitz event.
Dendrochronology of trees in urban environments, with the view to looking at the influence of stress on trees, and incorporation into management practice	Opportunity to incorporate wood sampling into the tree replacement programme.	Needs a separate research bid with a collaborating institution
Pollination and dispersal studies, especially of urban bird/plant relationships, including replacement of pollinators.	Good, and can be done with little financial input, initially, for simple work.	Probably best carried out collaboratively on the basis that the Gardens is an available site, for example, for university study.
Optimising performance of rare and endangered plants in garden situations.	Can be incorporated into the collections development, especially if the wider area of Hagley Park is available, and possible trials in other parts of Christchurch.	Opportunity for joint research, especially for key regional rare and endangered species.
Germination characteristics of selected plant groups.	Requires laboratory facilities - suggested for proposed new visitor/information centre building.	Potential to link with conservation and horticulture interests.
Comparison of different cultural techniques for plants.	May require significant staff time, and requires a dedicated area in the Gardens.	Outside funding probably needed.
Trials of turf species, including, or particularly of, native plants	Can be incorporated into existing work programmes.	Is interest by a commercial seed company and also one of the Crown Research Institutes.
Studies of tourism patterns and preferences.	Opportunities for research on a collaborative basis are good.	Lincoln University post-graduate thesis being undertaken – this looks at Asian tourism and community issues (2004)

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30. Research

Research area	Current capacity	Comments
Development of new cultivars.	Some ability to do this, for example, with begonias, and trialling for nursery industry being resumed.	Requires horticultural industry collaboration.
Historical research into Canterbury botany and horticulture.	Can be done, but far too cramped for space at present,	Some done at present, but limited by facilities.
Micro propagation of recalcitrant or rare species.	Facilities not yet developed for this.	A lot of scope for this kind of investigation, but would need sponsorship and /or guaranteed long term funding.
Pollination studies, for example, into the vanilla orchid.	Little equipment and time may be needed, except for advanced studies.	A request made already.
Trials of organically approved spray materials used to reduce drought stress.	No significant equipment required (researcher to supply), but does need monitoring.	Informal discussion on this already - to be followed up.
Experimental work to develop 'butterfly Gardens in Christchurch, especially for Monarch and Red Admiral butterflies.	Some expertise and lists of plants available.	Suggested informally in discussion with Forestry Institute - links to a suggestion for an insect conservatory.
Water monitoring and habitat restoration and assessment.	A management need.	Could be carried out in collaboration with Environment Canterbury, one or more local schools and the National Institute of Water and Atmospheric Research (NIWA).
Trials of specially designed container bags for limiting plant root and canopy growth.	Patented technology available.	Possibly a commercial partnership venture.
What tree species, and in what patterns, contribute to reduction in pollutants, for example, PM ₁₀ particulates and unwanted gases.	Some work done in the United Kingdom and would fit well with the tree replacement programme for Christchurch in determining species replacement.	Major research that would need collaborative approach – collaboration and information being sought from United Kingdom researchers.

There is little opportunity for the Gardens to have a major role as a research provider on its own. To do so would involve considerable infrastructure and operational expense and would be a significant move away from the primary mandates of the Christchurch City Council. It would put the Gardens into direct competition with existing and well established research providers such as the Crown Research Institutes and universities. The more realistic approach is to invest in development of collaborative research programmes, working alongside, and with, established research institutions.

In setting priorities for research in the Gardens, need to consider that:

- The Christchurch City Council is not a traditional large scale research provider, although, alongside Lincoln University and Environment Canterbury (ECan), a modest urban research agenda is being developed.
- Within Greater Christchurch there are two major universities, a polytechnic, and several Crown Research Institutes.

- There are limited incentives for input of private and corporate sector funding to research.
- A number of organisations have specific interests in indigenous plants and vegetation, or are involved in ecological restoration projects.
- Securing funding is often a convoluted and time consuming task.
- The Gardens itself has neither little tradition nor a track record in research.
- There should be on-site facilities and bench-space for students and researchers.

The April 2005 BioBlitz saw eighty to a hundred experts in organisms, ranging from bacteria and viruses to birds and flowering plants, in the Gardens for twenty four hours to carry out an inventory of life. The 1,200 different organisms discovered are on a database and this provides a good basis (until a full database system is in place) for recording future finds of animals, plants and fungi, and others. Discussion with staff indicates a willingness to record what life is around the Gardens so that, over a period of time, not only an inventory is maintained but trends and changes are recorded. This is, in itself, a valuable research function that helps with better management of the Gardens.

Public opinion

Research is one Gardens activity that does not appear to have been picked up by the general public. Many would be unaware of the research component of the activities of many botanic gardens, or even of the dominant science and research role of major international gardens, such as the Royal Botanic Gardens at Kew, United Kingdom.

However, interest has been expressed by tertiary institutions, especially where research collaboration can be worked through existing Memoranda of Understanding (MOU). There is also interest in building research relationships with other botanic gardens, this extending to the recent drafting of an MOU by an overseas botanic garden interested in developing a significant

partnering relationship with Gardens. Already, the Gardens hosts summer students from the two regional universities, a small but collaborative initiative.

Special issues

Developing a research agenda

Botanic gardens have the opportunity to be 'living laboratories'. Research can vary from high technology and high budget projects (such as molecular biology) to very low cost projects that involve observations on individuals or groups of plants as part of the regular work of staff. Something as simple as recording flowering and fruiting times or monthly bird counts is legitimate research that often fills knowledge gaps. Botanic garden research, at least with respect to Christchurch, should have a strong practical and applied end-point.

An indicative research agenda needs to be under continual review and aligned with relevant city strategies such as the Biodiversity Strategy and central city planning. There are opportunities for the planning for the Gardens to be innovative. One example is the investigation of trees in terms of their ability to absorb PM₁₀ particles that are a major problem in air pollution. Preliminary United Kingdom research indicates that mixes of appropriate species may reduce PM₁₀ concentrations in smog by up to 25%. This has particular relevance to Christchurch, with its aging tree problem. Another tree-related area of research is to correlate stress events, such as droughts and storms, with subsequent plant health. This can be achieved through the systematic retention of cross section 'biscuits' when trees are felled, along with core samples of living trees and correlation of growth rings and wood structure with past climate events.

The herbarium

Herbaria are systematic collections of dried plant specimens and associated material, and world-wide herbaria contain at least 270 million specimens⁸⁸. Herbaria are fundamental to taxonomic research and are a very important

⁸⁸ Baum, B. R. 1996. Statistical adequacy of plant collections. In: Stuessy, T. F. and Sohier, S. H. (eds). *Sampling the Green World*. Columbia. Pp 43-73.

adjunct to many other areas of botanical and horticultural research. They are also important in providing verification of identifications for plant material.

The Gardens herbarium (CHBG) was established in 1904 and is modest in size, with an estimated 8000 specimens. It is intended to provide a herbarium record of the Gardens living plant collections and to extend the herbarium to represent both Canterbury's native flora and New Zealand native cultivars. It also supports plant identification, research and teaching. A very important component of the collection is the Armstrong Herbarium (c. 1862-1926) with 2607 specimens largely from the Canterbury Province and probably including type material. Although bequeathed to the Gardens, the collection is at present on long term loan to the Allan Herbarium, Landcare Research.

Herbarium collections are generally housed in humidity and temperature controlled conditions. Under the Hazardous Substances and New Organisms Act (1996), if herbaria engage in specimen loan they must conform with 'containment' requirements regarding movement of specimens in and out of the herbarium and access to the herbarium. The herbarium at the Gardens is part of the New Zealand herbarium network (see <http://www.nzherbaria.org.nz/>).

There is need for a major upgrade of the herbarium. It does not meet containment requirements, is very small in floor area, does not provide adequate facilities for visitors and lacks an adjacent and fully equipped preparation room. There is little point in duplicating the role of other herbaria in the region, for example, Landcare Research and the University of Canterbury. Suggested priorities for the CHBG are:

- Vouchers for all plants grown in the Botanic Gardens.
- Cultivars, especially of New Zealand species.
- Vouchers for horticultural plants generally.
- Plants of the Christchurch region.

A national network system for herbarium data, headed by Landcare Research at Lincoln⁸⁹, is being developed as a grant proposal. As with other local government herbaria, the Gardens is not in a position to partner this proposal yet, but has indicated the wish to be kept informed on progress, with the likely opportunity of later involvement.

The requirement that herbaria will have to accord with 'containment' criteria limits public access. Consideration is being given to development of a public access identification and teaching collection to be held outside the main botanic garden herbarium. This could be associated with on-line flora, image and interactive key identification of plants⁹⁰.

A seed bank and germplasm bank

A seed bank is a facility where seeds are stored long term under controlled conditions to preserve particular species or genetic features. A germplasm bank is a more general term that includes not only seeds, but other forms of living tissue that can be stored long term, and then propagated. Many countries have either developed, or participate cooperatively in, genetic resource conservation programmes, and germplasm storage is practiced in a number of botanic gardens⁹¹. Often, this is linked to a conservation programme. Germplasm conservation, itself, has two key functions: (1) to preserve rare or threatened plant material, and thus help to avoid extinctions, and (2) to make plant material, which might be otherwise difficult to obtain, more readily available⁹².

⁸⁹ Aaron Wilton pers. comm. February 2004.

⁹⁰ Aaron Wilton pers. comm. October 2004.

⁹¹ Dixon, K.W. 1997. Gardening to conservation – the emerging role of botanic gardens in recovery of endangered species. In: Touchell and Dixon, K. W. (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGCI. Pp. 169-174; Australian Network for Plant Conservation 1997. *Germplasm Conservation Guidelines for Australia*. ANPC.

⁹² Gomez-Campo 1987. A strategy for seed banking in botanic gardens - some policy considerations. In: Bramwell, D., Hamann, O., Heywood, V. and Syngé, H. (eds.), *Botanic Gardens and the World Conservation Strategy*. Academic. Pp. 151-160.

A very important point is that germplasm (including seed) conservation is very different from keeping propagating material, such as seeds, in a freezer for relatively short periods of time prior to propagation. The latter is a very important aspect of plant propagation and collection maintenance, but is not conservation. Many institutions claim to be 'saving' seeds, but sometimes this is little more than standard refrigeration, with no deliberate regeneration of seed (periodic checks on germination and growing out when this falls below a prescribed limit).

Plant germplasm banking is traditionally focussed on seeds and whole plants, but, in more recent years, has moved to preservation of pollen, embryos and cultured meristem material. Most recently, it has moved to cryopreservation of plant tissues in liquid nitrogen at minus 196°C⁹³. Much past emphasis on germplasm preservation has been with commercial agricultural and forestry crops, but there is increasing interest in germplasm preservation for plants used in amenity and garden horticulture and for threatened species and plants of cultural interest.

A workshop at the fourth Botanic Gardens Conservation Congress urged a number of guidelines for botanic gardens, which would lead to a raising of standards and equitable resource sharing of germplasm⁹⁴.

- Botanic gardens that hold plant germplasm collections should bring the collections in line with the terms of the Convention on Biological Diversity (CBD).
- Botanic gardens should immediately seek to assist in undertaking their country's biological diversity action plans.

- Within the above context, botanic gardens must identify precisely their purpose in holding germplasm collections. This will enable gardens to develop appropriate sustainable solutions which achieve their objectives. Appropriate methods to conserve the germplasm will vary with the combination of species, conservation objectives and institutional resources.
- In the light of a recent BGC survey of germplasm conservation activities and facilities, botanic gardens must raise their technical standards to the highest level (that is, above those for crop germplasm) if their contribution to conservation is to be valuable. Particular attention should be paid to the genetic breadth of samples, their adequate documentation, their storage conditions and the monitoring of their viability.
- To succeed, botanic gardens must share the responsibilities of germplasm conservation through cooperation and collaboration.
- The germplasm programmes of botanic gardens, through national representation to the CBD, must seek practical solutions to the issues of prior informed consent for access to plant genetic resources and the fair and equitable sharing of benefits derived from the use of these genetic resources.
- Where possible, botanic gardens should take the opportunity to explain to the public the importance of genetic variation within cultivated plants and their wild relatives. In addition, technical assistance should be provided to community groups working with such material.

A very urgent area of germplasm conservation is that of horticultural cultivars. For some years, there has been concern that emphasis on threatened species on the one hand, and commercial crop plants on the other, will devalue plants cultivated for their amenity value. Even cultivars that have commercial value are often only available on the retail market for several years before disappearing forever. A reasoned case for conservation of cultivated plants asks the question, "What of our cultivated plants, in particular those used in horticulture – are they

⁹³ Touchell, D. H. and Dixon, K. W. 1994.

Cryopreservation for seed banking of Australian species. *Annals of Botany* 74: 541-546; Adams, R.P., Miller, J. S., Golenberg, E. M., and Adams, J. E. (eds.) 1994. *Conservation of Plant Genes II: Utilisation of Ancient and Modern DNA*. Missouri Botanical Garden.

⁹⁴ Anon 1997. Workshop 2. Germplasm banks. In: Touchell and Dixon, K. W. (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGC. Pp. 347.

equally in danger?"⁹⁵ This is an area of concern that botanic gardens can well respond to.

Any germplasm facility at Christchurch should be collaborative in nature. In the long term, the Gardens should look at national and international partnerships, and discussions have been held with the Millennium Seed Bank, based at the Royal Botanic Gardens, Kew, in the United Kingdom. This could, for instance, involve local partners. In the wider arena, links should be developed with universities based elsewhere and with the Millennium Seed Bank. Preliminary discussions with several potential partners have given rise to a shared initial interest in a collaborative facility, including opportunities for training.

Germplasm banking has significant ethical aspects that need to be taken into account. In response to the Convention on Biological Diversity, the Royal Botanic Gardens at Kew has taken the initiative to have an agreed policy between botanic gardens of the world, with respect to access to genetic material. This recognises the benefits to be obtained, including participation in research, sharing of results and genetic material, and commercial and other benefits arising from the use of genetic resources⁹⁶.

Library redevelopment

Fundamental to any botanic garden is a good library to provide:

- References for staff to research how to grow and propagate particular plants.
- Identification facilities for staff.
- General background information to be used in interpretation signs and programmes, including use by garden guides.
- Horticultural reference facilities for a wide range of outside users, including landscape architects, set designers for drama and historians.

- Flora research by outside clients.
- Storage of archival material, including maps, documents and photographs.
- Historical and cultural information on the botanic gardens.
- The entry point for CD-ROM and Internet searches for information.

The Gardens' current library facilities are quite inadequate with little change in forty years. Desirable standards for a new library include:

- Air conditioning of the whole library area, including archives.
- Space for expansion, especially for journals.
- Good security for highly valuable historic books.
- A separate area for archive storage.
- Working space for at least four to five people at any one time.
- Dedicated computer facilities for Internet, CD-ROM and DVD searching.
- Appropriate lighting that it is not damaging to library materials.

Rationalizing the library is important. Canterbury Museum and the McMillan Brown Library have an arrangement when approached by the public regarding donations of written material and books. If, for example, the Museum is offered non-Canterbury related material, they suggest the donor offer it to the McMillan Brown Library. This streamlines collections and limits duplication, while forming complimentary collections, further enhancing each as a specific, specialist library. Such a principle needs to operate between the Gardens and other libraries. The Gardens already complements the Landcare Research library in its horticultural emphasis.

The present collection (like the libraries of other old gardens) evolved largely from early curators donating personal collections to form a library, because there were often insufficient funds to

⁹⁵ Brickell, C. 1977. Conserving cultivated plants. *The Garden* 102: 197-201.

⁹⁶ Australian National Botanic Gardens 2000. Draft plan of management. Environment Australia.

allocate for books needed for research and plant habitat / cultivation / propagation information and labeling. An estimated eighty percent of the Gardens library collection is specialist material not held in another Council library. The Gardens library has been catalogued as part of the Christchurch City library system.

It is important that the library is integrated and Internet accessible. An important adjunct will be archival storage. This needs to be separated from the general library, with very strict adherence to archival standards for, for example, photographic materials, map storage, CD-ROMs and DVDs.

Partnerships

For the Gardens, the key to research largely lies in partnerships with strategic allies, which are generally larger research organisations. The Gardens needs to assess its current and potential strengths that it can offer and ensure that these are known to potential research partners. The Gardens are represented on the Christchurch Urban Forum, which includes representatives of the Christchurch City Council, Environment Canterbury and Landcare Research, under the auspices of the Isaac Centre for Nature Conservation.

Canterbury University has a memorandum of understanding with the Christchurch City Council. This is a commitment to develop collaborative working relationships in order to maximise their contribution to the growing of a dynamic, vibrant and innovative Christchurch. The Gardens has initiated discussions with the university. An annex to the protocol sets out priority actions under generic headings:

- Joint scholarship programme for research degrees.
- Public lecture series.
- Short courses and conferences relevant to the local government sector.
- Liaison with the University colleges.
- Appointments to Academic Advisory Boards.
- Council meetings at each other's venues.

- Collaboration on research initiatives.

The universities and the Gardens are seeking, through discussion, appropriate ways to develop working relationships. This includes consideration of internships, class projects, housing facets of the Gardens collection on university grounds, a collaborative approach to plantings, and events such as the BioBlitz, held April 2005. The Gardens (including the Friends of the Christchurch Botanic Gardens) have initiated involvement in developing projects suitable for student summer scholarships with the universities. These pick up on specific smaller project areas that have been identified, for example, historical research, surveys and assessment of horticultural performance.

There is opportunity for post-graduate projects; for example, relating disease incidence in trees to urban stress factors, and the study of tourism patterns and preferences. Such projects need to be able to feed results into the management system for the Gardens. A current example is the research of a Lincoln University student into attitudes and preferences within the Chinese community that relate to the Gardens. Another is a proposed University of Canterbury study of the origin of the Gardens design and function.

There are potential partnerships in education and awareness resulting from research activities. The Gardens is designated in the draft Christchurch Biodiversity Strategy as a central education point. Collaboration also extends to other organisation and interest groups:

- Local conservation organisations.
- New Zealand Restoration Trust.
- New Zealand Historic Places Trust.
- Botanical and horticultural interest groups.
- Neighbourhood organisations.
- A selection of schools that may be interested, especially for class projects.

A major area of collaboration and partnership is with the Friends of the Christchurch Botanic Gardens, Inc. The Friends are a support

organisation and also a major community interface. They are involved in a number of volunteer activities within the Gardens and have potential to be involved in further activities. These do not currently include research activities, but could, if a project portfolio was developed. Obvious examples of assistance include the herbarium and the proposed germplasm bank. Many of the Friends have useful skills, and working in the Gardens promotes a sense of community and belonging.

Finally there is collaboration and partnering with other botanic gardens and arboreta, for example, over comparative performance of species and cultivars. This should be facilitated through the recently formed Australian and New Zealand Botanic Gardens Network.

A research strategy

Goal 27: *Research partnerships and allied funding that ensure high quality research, with practical outcomes achieved that are supportive of the Gardens overall direction, will be sought.*

Action 27.1: While recognising that the Christchurch City Council is not a traditional large scale research provider, opportunities will be used to develop research collaboration with local research institutions.

Action 27.2: Current and potential facilities and strengths that the Gardens can offer will be assessed, and investigation will be made of the possibility of research associates.

Action 27.3: Industry funding for research programmes, where they directly impinge on such things as marketing of new horticultural products, will be sought to be facilitated by the Gardens.

Action 27.4: Research programmes will look to a mix of funding from various sources rather than single major funding sources, and subcontract arrangements will be sought by the Gardens so that some exposure to the costs of entering research bidding programmes are shared.

Goal 28: *A research agenda will be maintained under ongoing review, this being based on inherent strengths, operational reality and potential partnerships.*

Action 28.1: Potential ways of utilising the Gardens collections for research will be made known to universities and other research organisations, and partnerships with schools will be sought for such matters as monitoring wildlife and habitat health.

Action 28.2: Development of trials and monitoring of species, cultivars and urban planting systems, such as turfs and low maintenance landscaping, especially those commonly used in amenity horticulture, will be promoted in the Gardens and Hagley Park.

Action 28.3: Low cost, but valued research that is within the capability of existing staff and operations will be identified for the Gardens.

Goal 29: *Facilities will be developed and maintained that are appropriate to service the present and likely future research needs of the Gardens and will ensure a high quality of research.*

Action 29.1: A core of research facilities, including a basic general laboratory, herbarium, library and germplasm (seed) bank as an integrated science suite, will be provided in the Gardens.

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30. Research

Action 29.2: The herbarium will be redeveloped and enlarged to specialise in cultivated plants, plants of the Christchurch region, along with rehousing the Armstrong Collection (currently on loan to Landcare Research).

Action 29.3: The present collection of woody specimens will be increased in size and range to take advantage of the city's 'aging tree' replacement programme, with routine taking of wood samples from representative exotic and native trees that are felled.

Action 29.4: A collaborative germplasm (seed) bank will be scoped, with a focus on heritage plants, regionally suited cultivars, rare and threatened plants of the eastern South Island and species used in vegetation restoration.

Action 29.5: The gravity base station and meteorological station will be retained and protected.

Action 29.6: A modern library, including increased book and journal space, archival space, workspaces for staff and visitors and internet facilities,

will be developed, the focus being on horticultural and botanical publications and reports.

Action 29.7: Bench space will be developed for outside researchers, and consideration given to hosting visiting researchers.

Goal 30: *Research results will be presented and disseminated in ways that are appropriate to a botanic garden that has a high level of public use.*

Action 30.1: A publicly accessible identification and teaching collection will be developed apart from the core herbarium, to be eventually associated with on-line floras and image-based interactive identification systems for plants.

Action 30.2: Except where there are commercial or cultural constraints, research results will be available to the public, and development of an 'occasional' publication series and a lecture series on science, as well as the making use of other media for research outputs, such as the Internet and CD-ROM or DVD outputs, will be scoped for the Gardens.

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30. Research

Table 30.2: Research activity (development / action) priority chart

	More urgent		Less urgent	
	More important	Less Important	More important	Less Important
Cannot be done or completed within existing budget – major capital or operational item		<ul style="list-style-type: none"> ▪ Outputs developed 	<ul style="list-style-type: none"> ▪ Seed/germplasm bank ▪ Library facilities increased ▪ Herbarium redevelopment ▪ Public access ID/teaching 	
Can be done within existing budget – may often involve attitudinal change	<ul style="list-style-type: none"> ▪ Planning science suite ▪ Assessment of strengths ▪ Research agenda ▪ Staff database for records 	<ul style="list-style-type: none"> ▪ Standards of practice ▪ Tree/wood collection ▪ P-G and honours projects ▪ Community research ▪ Lecture series 	<ul style="list-style-type: none"> ▪ Negotiate with research partners ▪ Develop horticulture trials ▪ Research associate system ▪ Industry funding 	

31. FUNDING

Explanation:

“Funding” is potentially obtained from a variety of sources.

Objective:

There will be encouragement of a range of revenue sources being used that further the Gardens goals and objectives, including the Gardens being a commercial provider of botanical and horticultural products.

Introduction

Botanic gardens are major draw cards for the general public and tourists in many parts of the world, attracting perhaps in excess of a hundred million visitors annually in total. They are places for recreation. They are a foundation to an ever expanding horticulture business and culture. They link people and plant culture and use. They popularise an ever increasing range of plants to help feed the appetite of an army of home gardeners and plant collectors⁹⁷. They reflect the global heritage that plants are.

Many botanic gardens are under pressure to recover part of their costs, especially when significant numbers of visitors are from outside the region or country and hence to do not contribute to the gardens through local taxes. Important in this, is to not take shortcuts that may compromise other botanic garden functions and values; for instance, cutting back on skilled and qualified staff.

For most botanic gardens, the question is not *if* they should get involved in issues such as conservation, education and events, but *how*, and often this revolves around funding. Botanic gardens are expected to engage in an increasing range of activities, but money is often the limiting resource, even where ideas are plentiful⁹⁸.

⁹⁷ Bublitz, L. R. [no date]. *The Business of Gardens*. Report of a Winston Churchill Memorial Trust Fellowship.

⁹⁸ van den Wollenberg, B. J. W. 1997. Botanic garden and commercial partnership for conservation – an example from The Netherlands. In: Touchell and Dixon, K.W. (eds.), *Conservation into the 21st Century*.

Commercial partnership is one avenue, but this must not be taken lightly – success may be a while coming and serious support may only be forthcoming when there is a track record of carrying out what one has set out to do. In both Australia and New Zealand there has been a marked change in recent years in attitudes towards public funding⁹⁹. In recent years, economic rationalism has swept through the public sector and directed much of the political debate towards the view that nothing is worthwhile unless it makes money.

Although botanic gardens are the most visited cultural organisations, there is often little understanding by outsiders of the real needs and the costs of operation. Botanic gardens have to not only tell people about plants, but also about the many direct and indirect benefits that a botanic garden provides and what funding is needed to run them¹⁰⁰. It also means changing corporate cultures, setting up good strategic planning and engaging in marketing.

There are a surprisingly wide variety of sources of income, but those that are commonly encountered include¹⁰¹:

- Profits from sales, including of plants, books and souvenirs.
- Income from hiring facilities within the gardens.
- Endowments, bequests and other invested capital.
- Donations from visitors and supporters.
- Grants from government, trusts and business firms.
- Gate takings, including special displays and exhibitions.

Kings Park and Botanic Garden and BGCI. Pp. 151-154.

⁹⁹ Bedford, D. J. 1997. A way forward for botanic gardens. In: Touchell and Dixon, K.W. (eds.), *Conservation into the 21st Century*. Kings Park and Botanic Garden and BGCI. Pp. 271-276.

¹⁰⁰ Bedford 1997.

¹⁰¹ Bublitz [no date].

Seeking donations, especially substantial ones, should not be left to chance - there are many ways in which people can be encouraged to give to the needs of the gardens. An important aspect of accepting donations, and especially bequests, is that conditions tagged to money must not compromise the integrity of the gardens. The aesthetics and collections value of a botanic garden are easily destroyed if donors set the rules. Final decisions on use of resources, money and donations must remain in the hands of a Gardens administration.

Major funding issues for the Gardens

The Gardens core funding is through the Christchurch City Council and derives from local body rates. There is a long standing assumption throughout New Zealand that facilities largely funded from rates and taxes, such as botanic gardens, museums and many art galleries, will have free entry for the public, as is the case with national parks and scenic reserves. Although there is currently relatively little tax incentive for donations and bequests, it is interesting to note that many of the major facilities in the Gardens have been funded in the past from private sources. This suggests that there is significant private sector interest in the Gardens.

There has probably been little incentive in botanic gardens in New Zealand, generally, in developing large retailing facilities. In contrast, for many overseas gardens, retailing provides an important source of revenue. The Friends of the Gardens provide a significant funding source for 'add-on' but not core funding for Gardens projects. Such funding, and other external funding, is intended to be used for 'the icing on the cake' and not to bolster core funding, especially that for essential operations. There is the opportunity to build on the Friends' funding and, in particular, to form a Trust for both promoting and safe-guarding external funding to the Gardens. There needs to be a familiarity with appropriate funding agencies, as well as knowing of potential donors interested in gifting resources to the Gardens. It is also important to ensure that donors are well regarded and treated.

The Gardens has to be cautious about small scale charges - when the transaction fee is small, it may cost more to process than what is gained from the

transaction. Hiring fees are probably going to always provide a relatively small part of the income for the Gardens and there is little to be gained from subsidising events that effectively result in a loss to the Gardens in terms of both staff time and money. Income from major concessions such as the Café and the Curator's House Restaurant do return to Council, but not to the Gardens directly, although the Gardens do derive indirect benefits.

Public perceptions

Public comment on funding has produced interesting reactions. Negatives include that too much is being spent on public facilities, such as the information centre, and not enough on collections or staff numbers. On the other hand, it is also argued that the Gardens have operated for too long on too small a budget. There have been, generally, few submissions on financial issues. With respect to retailing, there is general support for an outlet to retail books, gifts, and so forth, but also a call for high standards of both service and product.

Special funding issues

Entry fees, visitor charges and retailing

Entry fees constitute an interesting issue. Although outside New Zealand entry fees may sometimes be charged and people will pay relatively high sums of money for quality events, there is a general tradition that tax payer financed facilities should be either not charged for or the charge should be less than the true cost. Hence, the innumerable arguments about whether or not to charge entry to national parks and can the government levy a tourist tax on overseas visitors, including a charge component for such areas. Evidence from a number of countries suggests that gate fees have a profound effect on visitor numbers.

The issues faced by the Gardens are no different. There has never been an entry fee charged, although, technically, it is the rate payers of Christchurch who finance the Gardens and thereby subsidise every overseas visitor in excess of two dollars. To minimise the effects of this, the Gardens does have donation boxes and these need to be more strategically placed – preferably at

points of departure and the “wow” points in the Gardens.

Many botanic gardens charge for admission to special collections or exhibitions. A good example is the National Orchid Collection in the Singapore Botanic Garden. Entry to the Gardens generally is free, but two dollars is charged for entry to the orchid collections. This is one way that money can be obtained indirectly, in lieu of an entry fee, as such. A good example of what can be done is provided by the unusual South East Asian aroid, *Amorphothallus titanum*. This is very spectacular and is the world’s largest example of a flower cluster. Fairchild Tropical Garden has charged entry to see it developing. Moreover, a local paper ran a sweepstake where people guessed the date on which the flowers would open.

The third major area of revenue generation is retailing. It can be a very good way to recoup some of the ‘losses’ that result from free entry to a botanic gardens. Once visitors come into a botanic garden, the good feelings that should be evoked can be used to financial advantage in shops and restaurants, many of which are relatively new ventures that have generally proved highly successful. Most botanic gardens that have in excess of 100,000 visitors annually have such facilities¹⁰². Good shops and restaurants encourage additional visitors to the gardens, who come primarily for these facilities and secondarily to discover the gardens.

A key issue is to sell quality goods that have a botanical, horticultural or conservation theme. It is useful to try and get the logo on as many items as possible so that goods bought are identified with their purchasing source. There are very good opportunities for botanic garden retailing to build up a reputation as the ‘best’ supplier of goods, such as books and gardening accessories. There is also good opportunity to profile local suppliers. In the United Kingdom the National Trust sources 40% of its goods locally, thus ensuring that regional industries and crafts are supported¹⁰³. The Gardens in Christchurch are especially well placed for capitalising on local sourcing, as Christchurch already has strong traditions for handcrafts and the arts, and the Gardens are part

of the so-called Cultural Precinct, being adjacent to the Museum, Arts Centre and Art Gallery.

There is also ultimately the need to associate the three key Gardens entry and exit activities of information, retailing and eating close together. A good example of this is seen at the Singapore Botanic Gardens, where one enters the gardens past an information desk, then into a very attractive courtyard with retailing on one side and eating on the other. Although many botanic gardens do have a single retailing outlet close to the main entry and exit area, some do have multiple outlets and this allows capture of visitor dollars in various parts of the Gardens, as well as specialization of outlets.

Other areas of revenue generation include payment for parking (some gardens and parks charge for parking, but not for entry through the gate), and payment for special events. Christchurch currently charges for weddings, commercial photography, film crews, leases and guided tours. As well, but quite separate, there are gifts and endowments, and grant funding (see below).

Plant sales

Plant sales are an important adjunct to retailing of other goods. The reasons for selling plants, and the way in which they are sold, can vary considerably. The RHS gardens at Wisley source eclectic plants from many nurseries across the United Kingdom and sell them at premium prices. At Sissinghurst, plants propagated by the garden, but surplus to requirements, are sold, thereby reducing theft. Savill Gardens, near Windsor, raise plants not only for themselves, but for sale to other parks and gardens. The gardens at Bodnant simply raise plants for offsetting costs and ensuring the gardens future¹⁰⁴.

An important issue being discussed increasingly by botanic gardens is niche marketing. Should botanic gardens simply duplicate what is available at weekend boot sales, parish and school sales, and Saturday markets? Should they try and produce a significant proportion of elite plants propagated from botanic garden stock and generally unavailable elsewhere? This kind of

¹⁰² Bublitz [no date].

¹⁰³ Bublitz [no date].

¹⁰⁴ Bublitz [no date].

move requires quality control, possibly greater propagating skills than normally available to the volunteers who often run these sales, and advertising so that people know that botanic garden sales are 'different'.

Several important aspects of niche marketing of plants are noted:

- Branding – including the Gardens and/or Friends logo on products.
- Use of good permanent labels and a higher quality label for 'superior' plants.
- Indication, perhaps by a symbol, of plants of conservation importance.
- Not selling anything that has weedy tendencies.
- Illustrations of flowers, fruit and other plant features for at least a selection of plants, especially those that are highly seasonal in growth (for example, bulbs), so that when people buy they have some idea of what is attractive.
- Selecting a number of species for each plant sale (perhaps the more iconic examples) that can be imaged onto a PowerPoint presentation that can be run as a continuous loop in the Information Centre during the sale.
- Quality control on plant condition and size, and containers.
- Availability of cultural information – perhaps generic information for various groups of plants as hand-outs.

A form of premium that can be an income generator is to put a surcharge on rare and endangered species, with this extra money going into specific and related research projects. An interesting and highly relevant aspect of this, relating to benefit spreading provisions of the UN Convention on Biological Diversity, has been developed by the Royal Botanic Gardens in Edinburgh, United Kingdom.

Endowment funding, gifts and grants

The Gardens are where they are today through the ongoing generosity of citizens who, over many years, have given to capital projects. Some of the more significant items given to the Gardens or paid for from private funding have been:

- All the conservatories and the fernery.
- The Rolleston Avenue fence.
- Many seats.
- Heritage rose collection.
- Gates for the Gardens and Hagley Park.
- Fountains.
- Bandsmen's Memorial Rotunda.

What this indicates is that the Gardens would be a much poorer place, were it not for the generosity of the people of Christchurch. The 'Garden City' has been augmented as far as the Gardens is concerned by the people themselves.

It is important that the Gardens, as an institution, is regarded highly and in a positive light as a 'jewel in the city crown', and that it is seen as catering for the needs of many people and not just for a small sector. To a large extent, finance generated through such avenues results from personal involvement of individuals in the work of the Gardens. An important aspect of accepting donations, and especially bequests, is that conditions tagged to money must not compromise the integrity of the Gardens. Wishes must be accommodated as far as possible, but final decisions must remain in the hands of the Gardens administration.

Major donors, individual or corporate need to have long term recognition. This may amount to membership of an elite donors group, standing invitations to prestigious events and dinners, and botanic garden publication subscriptions. Donors also need to be nurtured and looked after. Donors must be treated with respect at all times and, where there is an indication of hurt feelings or lack of appreciation, time taken to repair bridges. It is not only that the donor may otherwise be

unwilling to make further donations, but donors do speak to each other.

An important aspect of corporate funding is the benefit that will accrue to the donor. Hence, it is important to ensure that there is publicity, naming rights for a major donor and that what is being funded is a success. Acknowledgement on site should be simple, yet elegant and obvious. Currently, the Gardens has a modest naming rights system for memorial seats in the Gardens only. Yet, in the past, the naming of features by donors was more prevalent, going by the widespread naming of the conservatory elements, garden gates and so forth. This should now be accepted as part and parcel of substantial donations.

A further, and important, funding source is the use of grants from a range of sources and funds. These are usually utilised for specific projects as one-off grants and should not be relied on to meet short falls in other funding or operational funding. The Gardens has made use of such funding previously, but there is considerable scope to seek this kind of funding much more actively.

Development of a Trust and protection of funds

A problem with funds is that unless they are hedged, if they are held as part of Council funds, there is the risk they are absorbed back into general council funds. Especially in situations where funds may be held for a number of years, or are used for generation of interest for spending rather than expenditure of the capital, a legal trust fund should be set up. This ensures that the funds are preserved for their intended purpose.

There needs to be transparency in administration of funds, and it is necessary that investment of the principal is done responsibly and according to Council guidelines. Donors need to be assured that their funds are used for the intended purpose. Even where funds do not have to be for a specific purpose, there should be reporting back on their use to the donors.

The Council has a good example of such a Trust in that associated with the Council administered Art Gallery. This is an example that the Gardens should seek to emulate with urgency.

The funding and facilitating role of the Friends of the Gardens

Friends' organisations are important for the continued support of the institutions that they are associated with. The Friends of the Christchurch Botanic Gardens are no exception. Friends represent a partnership between 'professionals' and 'volunteers' that should only benefit the botanic gardens. Friends are a valuable source of talent and skills, advice and direct funding, such as through plant sales, but can also source funding sources unavailable to local government.

During the more than ten years of the Friends' existence, they have provided very useful funding for the Gardens. This has included audio and lecture equipment, wheel chairs for the disabled, staff travel, a summer scholarship and annual library grants. Attempts to grant an annual staff award have been variably successful, but now continue as an annual sum of money for staff development.

It is important that outputs from the Friends are of a high class and that they also reflect the close synergy between the Gardens and the Friends organisation. There is need for a good personal touch, notes of thanks and expressed appreciation. This encourages members of the Friends to give value because they themselves are valued. It is important that Gardens staff are visible to Friends, and the present arrangement at the Gardens, where the curator attends Friends' committee meetings, needs to be continued. At the same time, there is a need to allow the Friends independence and to advise without dictating.

Legal status is important. The Friends should be incorporated as a charitable organisation. It is probably desirable for the Gardens and the Friends, along with representatives of City Council legal and property services, to form a funding group that can identify opportunities and needs for funding. It is important that funds are not used to bolster what should be Council spending – in other words, they are used for 'the icing on the cake' and not to contribute to essential core funding.

A funding strategy

Goal 31: *The Gardens will facilitate the giving and gifting of resources (plants, money, time, works of art and project funding), at every level, by the public, corporations and government agencies, and ensure that there is a reasonable return on funds invested.*

Action 31.1: The three key Gardens entry and exit activities of information, retailing and eating need to be sited close together.

Action 31.2: Donation boxes need to be strategically placed and be more obvious and inviting, and at 'wow' points in the Gardens, for example, the Townend House and the Rose Garden.

Action 31.3: Money may be obtained directly by charging entry to exhibitions - this possibility needs to be modelled.

Action 31.4: A form of premium that can be an income generator is to put a surcharge on the sale of rare and endangered species, with this extra money going into specific and related projects.

Action 31.5: Major funding will be pursued with vigour and major donors will be given full recognition, including naming rights, where appropriate, and long term Garden relationship recognition.

Action 31.6: Consideration will be had to the formation of a Trust to handle gifts of money, and other resources, with a view to seeking funding and safeguarding existing funding, including returns from investment of capital.

Goal 32: *The special role of the Friends of the Gardens, and its partnership with professionals, volunteers, City Council and the public, is recognised, with respect to both direct and indirect funding for the Gardens.*

Action 32.1: The Friends will take advantage of new legislation involving gifts and will ensure that at all times it has charitable trust status.

Action 32.2: Close collaboration between the Council's Botanical Services Operations Team and the Friends of the Christchurch Botanic Gardens will continue, including involvement in the funding and facilitating of new projects.

Goal 33: *There will be scoping and development, for the Gardens, of an enlarged profit making retail facility (that includes plant sales), based on a distinctive niche that is related to the direction planned for the Gardens and, where appropriate, on its own branding.*

Action 33.1: A distinctive reputation as the "best" supplier of goods related to botanic gardens to a full range of customers will be sought to be developed for the Gardens.

Action 33.2: Retailing will endeavour to source locally for products, especially among handcrafts and the arts.

Action 33.3: Plant sales will look to niche marketing, with a significant proportion of stock being elite plants not readily obtained from other sources, and will ensure quality control and branding.

CHRISTCHURCH BOTANIC GARDENS MANAGEMENT PLAN (AUGUST 2007)

- PART IV ISSUES AND ACTION PLAN -

31. Funding

Table 31.1: Funding activity (development / action) priority chart

	More urgent		Less urgent	
	More important	Less Important	More important	Less Important
Cannot be done or completed within existing budget – major capital or operational item			<ul style="list-style-type: none"> ▪ Improved retailing facilities 	
Can be done within existing budget – may often involve attitudinal change	<ul style="list-style-type: none"> ▪ New donation boxes/sites ▪ Niche market plant sales ▪ Trust for funding set up 	<ul style="list-style-type: none"> ▪ Rare plant surcharge ▪ Funding source database 	<ul style="list-style-type: none"> ▪ Exhibition charging ▪ Sourcing local suppliers 	

32. NON-BUILDING INFRASTRUCTURE

Explanation:

“Non-building infrastructure” covers built structures and facilities in the Gardens, other than buildings.

Objective:

Maintain and effectively manage non-building assets, to improve and maintain quality and maximise an assets life span.

Irrigation

The Gardens has an area of 14,847 square metres automatically irrigated with eight independent irrigation systems. The remaining portion of the gardens is not irrigated or relies on manual irrigation with hoses being used from tap points.

It is identified that considerable savings are attainable in water consumption and increased effectiveness if automated irrigation systems are utilised, There is also considerable ongoing cost benefit in operational expenditure, there is however a significant capital cost.

The Royal Botanic Gardens (Melbourne) have reduced irrigation water use by 60% in 2004-05 compared to 1994-95’s consumption of 251 ML (when irrigation improvements began). This has occurred during a climate of ‘lowest on record’ rainfall (from 1996-2004) and with over 3.3 hectares in landscape extensions added to the irrigation management regime.

Road and Path Networks

The Gardens comprises a series of path and road networks, made up of different widths and materials:

Path type	Number	Length (metres)	Area (metres ²)
Asphalt	23	2,157	12,563
Gravel	81	6,481	23,665
Cobble	6	219	1,565
Miscellaneous	21	165	328
Total	131	9,022	38,121

Bridges

The Avon River surrounds much of the Gardens and access is via several bridges of various ages and design. The utilitarian bridge at the western end of the gardens provides major vehicular access. The Botanic Gardens Car Park has a pedestrian bridge that was upgraded in 2002. The woodlands area in Hagley Park between the Avon River and Riccarton Avenue is accessed via an arched bridge (called the Woodland Bridge) that serves both pedestrians and service vehicles.

Bridge	Weight restrictions
North Bridge	4.0 t
West Bridge	14.0 t
Woodland Bridge	4.0 t

Seats

There are a variety of seats and seating options within the Gardens. Garden furniture is currently being replaced with sympathetic furniture appropriate to areas within the Gardens. All removed seats are being utilised within Hagley Park to provide seating options and cater for views of vistas and visitor fatigue within the Park. It is the current practice to progressively replace the standard park bench, which is the dominant seating option, with area styled seating and furniture, including heritage seating within the formal areas of the Gardens and rustic furniture in areas that have a less formal structure.

Drinking fountains

On main walk next to the Australian border
In the playground area
Next to the Peacock Fountain
On the Archery lawn
Next to the Rock Garden lily pond
Te Puna Ora
In front of the information centre

Electricity

The Gardens has several areas that are used for entertainment and a variety of activities that require supply of electricity. Currently, the woodlands and the observatory lawn have an adequate supply. The Gardens have identified areas that require an improved or new electrical supply, including the conservatory complex and the Armstrong and Archery lawns.

Lighting

The Gardens, while closed during the hours of darkness, has some existing lighting, mainly around the Botanic Gardens Car Park. The Rolleston Avenue frontage has extensive tree floodlighting. There have been occasions in the past that access is required and desired after dark, and the provision of additional lighting would provide for a wider range of activities and events.

Tree lighting by floodlight is currently at the Rolleston Avenue entrance in the form of significant white lighting up lights. Options need to be explored to reduce cost. Appreciation by visitors could be increased with implementation of more creative and visually appealing options.

Fences and Gates

The Gardens have several prominent fences and gated entrances, notably the Rolleston Avenue fence, Riccarton Avenue gates and the Christ's College wall.

Gates

Museum - Rolleston entrance	Ornamental metal
Hereford St - Rolleston entrance	Ornamental metal
Cashel St - Rolleston entrance	Ornamental metal
Curators House - Rolleston entrance	Ornamental metal
Curators House - Rolleston entrance	Ornamental metal
Woodland Bridge	Ornamental metal
West Bridge	Ornamental metal
Kiosk Bridge	Ornamental metal
Nursery yard	metal
Nursery yard	metal
Yard entrance	metal
Yard entrance	metal
Friend's Yard entrance	metal
Curators house	wooden
Meteorological station	wooden
Christ's college entrance	wooden
Nursery riverbank	wooden
Nursery riverbank	wooden
back nursery glasshouse	wooden
Alpine yard	wooden

A non-building infrastructure strategy

Goal 34: *The Gardens will maintain assets to meet functional and aesthetic requirements in a safe and efficient manner.*

Implications on the operational budget will be a consideration in planning or implementing any new infrastructure.

Continual review will occur within the asset management plan to provide for energy efficient options, that reduce waste.

Action 34.1: An irrigation and water conservation plan will be developed.

Action 34.2: Along with the asset management plan there will be continual review of infrastructure to provide for the changing needs and uses within the Gardens.

Action 34.3: The addition of any furniture item will be sympathetic to the surrounding environment.

Action 34.4: The addition of services below ground should be considered in any redevelopment of areas within the Gardens to provide for possible future uses.

Action 34.5: To extend usage lighting should be considered in any development.

Action 34.6: Provision for shelter within the Gardens needs to be considered any development.

Action 34.7: The historic nature and distinctive character of the entrances and boundaries needs to be maintained to an appropriate level.

Action 34.8: Provide free fresh water at several points throughout the Gardens for the use of visitors.

33. BUILDINGS

Explanation:

“Buildings” covers the wide range of facilities housing people, equipment and plants in the Gardens.

Objective:

Retain a building asset resource that effectively meets all building facility needs for the Gardens, to ensure that it is adequate for the purpose and is of a standard suitable to service and promote the Gardens.

Maintain and effectively manage building assets, to improve and maintain quality and maximise an assets life span.

Botanic Gardens buildings

Facility	Constructed	Heritage Status
Staff		
Potting Shed	1994?	
Production Greenhouses		
Chemical Store	1994	
Mess Room / Library		
Offices / Workshops / Plant Storage		
Visitor facilities		
Information Centre	1986	
Tea Kiosk		
Curators House	1920	Group 3
Playground Toilet	1969	
College Border toilet block	1969	
Woodland Bridge toilet block	1969	
Conservatories		
Cunningham House	1923	Group 2
Townend House		
Garrick House		
Gilpin House		
Foweraker House		
Fern House		
Bonsai House		
Collection support?		
Bandsmen’s Memorial Rotunda	1924	Group 3
Magnetic Observatory workshop		

Facility	Constructed	Heritage Status
Herbert Memorial Shelter		
Other buildings		
Robert McDougall building	1932	Group 1
House - 6 Riccarton Avenue		
Ex-North Hagley Bowls Club Building	1945	

Background

The need for a long term vision and improved staff accommodation, research, education and interpretation facilities in the Gardens was identified by Councillors whilst resolving the future use of the Robert McDougall building (refer Strategy and Finance Committee meeting in August 2002).

“Although not part of its brief, the Subcommittee has also decided to comment on three further issues which emerged during the site visit or at the hearing, namely:

- 1. The standard of accommodation of Botanic Gardens staff.*
- 2. The provision of headquarters for the Friends of the Botanic Gardens.*
- 3. The provision of a purpose-built building, to enable a number of initiatives suggested by the Friends of the Botanic Gardens to be implemented.*

In the course of the site visit a number of buildings were inspected, including staff accommodation and the former Ex-North Hagley Bowls Club building. Councillors were not impressed with the standard of staff accommodation and believe that steps should be taken to improve the conditions some staff are working under.

The Subcommittee noted that the Friends of the Botanic Gardens require a base for their activities and consider that the Ex-North Hagley Bowls Club building, if upgraded, would be suitable for this purpose.

The submission from the Friends of the Botanic Gardens highlighted the need for a suitable building to undertake a range of activities not currently possible owing to the lack of suitable facilities. These include:

- *Education and study area.*
- *Research facilities.*
- *Housing for the herbarium and archival material.*
- *Library facilities.*
- *Permanent displays for greater botanical awareness.*
- *Information centre (for Rolleston Avenue entrance).*
- *Sufficient quality retail space.*

The Subcommittee considered that it would be inappropriate to use the Art Gallery building for these activities given that the building was built expressly for an art gallery and a substantial amount had been spent by the Council in the last decade to bring it up to the standard required for the display and protection of works of art.

In the Subcommittee's view a purpose-built facility is required in the Botanic Gardens for the above activities."

The Subcommittee concluded that:

"3. An inter-unit project team should be established to develop a long-term vision and development strategy for the Botanic Gardens taking into account the issues raised in the submission from the Friends of the Botanic Gardens and the need to provide improved working conditions for Botanic Gardens staff.

4. The former Ex-North Hagley Bowls Club building should be upgraded and made available as a base for the Friends of the Botanic Gardens."

The report was adopted by Council at its Ordinary Meeting on 22 August 2002.

The councillors' views corresponded with those of the Parks and Waterways Unit, as minuted in a meeting held on 23 May 2002, discussing the future uses of buildings in the Gardens.

Subsequent site analysis, market research, and staff consultation studies have now been undertaken to better understand the demand, condition and constraints on built facilities in the Gardens.

An investigation of the Ex-North Hagley Bowls Club building has identified that the building is an earthquake hazard and that structural strengthening, fire safety, access and sanitary facility upgrades would cost approximately \$345,000 (April 1999).

Existing built facilities and issues

Staff facilities

The staff facilities have evolved haphazardly during the past 50 years and have been overlooked in priority in favour of the collections. The complex has evolved by the necessity to make do with the resources available.

The offices, smoko room and ablutions have previously been used for other activities, such as spray painting with lead based paint. They have been identified by staff as being cold, damp, dirty, out of date and suffering from rodent infestation. The ablution areas are very uncomfortable in winter, especially for showering.

A major problem with these facilities is that they are not interconnected, with individual spaces opening directly onto the yard.

There is insufficient room for staff workstations, insufficient storage and no work area for gardeners on wet days.

The production greenhouses are undersized and inflexible, they are of insufficient height, the concrete floors are breaking up and they have inadequate environmental controls to maintain collections in their desired psychometric range.

The boiler for this facility has been repaired a number of times and is now operating at a reduced capacity until it is replaced in the near future.

The potting shed, although the newest of the staff facilities, is poorly configured such that the mezzanine spaces are generally not used. The ground floor spaces are not suitably located and sized to support the functional processes that take place in the processing of plants into or out of the building.

Visitor facilities

Toilets have been rated the lowest out of 26 differing aspects of the Gardens (Opinions Visitor Profiling Exercise 2003/04, which involved 2,526 interviews). They are not pleasant to use due to their age, construction, design and location. The configuration of the toilets is also unsuitable in terms of occupant safety.

The Opinions surveys rated the Gardens Café, Gifts and Souvenirs and the Information Centre as 3rd, 4th and 8th lowest respectively out of 26 aspects of the Gardens.

The Tea Kiosk building is uninviting and does not connect well with its setting. It has undergone multiple modifications, and enclosures since its re-construction (after being burnt down in 1922) and has lost the simplicity and symbolism of what was originally an eccentric garden folly, in the English tradition.

Surveyed users have identified issues with the cost, variety and quality of the service.

The location inside the Gardens restricts access for servicing, and limits hours of operation.

There exists a dichotomy of primary entries to the Gardens, and the provision of a single information centre will never be ideal to address this. However, the proposed Museum redevelopments may help resolve this for the future.

Focus group investigations (Opinions - October 2004) have identified that the Information Centre is perceived to be "hidden away". Participants stated that the building should be associated with a café and toilets, and that potentially it might have study or teaching rooms and a dedicated library. Approximately 8% of visitors use the information centre.

The present information centre has already been extended once and further extension is restricted by the configuration of the building. The building is introverted in nature with not much appeal to casual passers-by. Reasons for this lack of appeal are the limited glazing fronting the pedestrian route (due to office and storage areas adjacent the path), the separation of the building from the Botanic Gardens Car Park entry path and the singular function of the building. It is now well recognised that information centres have the greatest patronage when they are part of a greater package that includes food and other supporting functions.

The present building is relatively new, and is in a good state of repair.

The location of the existing information centre restricts access for servicing and limits the hours of access for other uses. The size of the building limits the scale and number of concurrent exhibitions that may be displayed. This restricts the ability of the Gardens to market itself as a wet day destination.

The Curator's House Restaurant appears to be well suited to its present use. It is not suitably located for use as an information centre, with around 10% of visitors using the adjoining two entrances. The building configuration and heritage status would also restrict conversion for information display and distribution.

Conservatories

The conservatories are an important asset of the Gardens, with approximately 20% of visitors including this activity as part of their visit. The conservatories allow staff to create an artificial climate suitable for collections that would otherwise not survive in the Gardens. The collections that are displayed include crops for one off display, collections rotated out of storage for display before returning and some plants on permanent display.

There are a number of issues with the current conservatory complex. They are not cohesive, with pedestrian circulation between fragmented buildings requiring a concerted effort by visitors to visit each. The available space for display of collections is insufficient, such that nationally

important collections such as the orchids are in permanent storage. Other collection displays are limited in scope by the available space.

Collection security is in some cases very poor, with the Bonzai collection now only a fraction of its original size due to theft. Climate control in Townend House, in particular, is not good, shortening the potential display life of plants.

The Bonzai house is suffering from bank settlement and is in a poor state of repair. Security measures in the Alpine House detract from viewing of the collection, with steel grilles presenting plants in a cell like setting.

The diesel boiler for the complex requires regular tanker deliveries and will reach the end of its life in the foreseeable future.

Collection Support

The over-riding theme that resulted from the market research completed by Opinions was that the Gardens collections were well appreciated by clients, but that the visitor facilities and support were in need of improvement.

The number and frequency of structures supporting and aiding in the setting of collections in the Gardens is small and infrequent compared to many comparable equivalents. Built structures associated with collections bring a focus to the setting and allow for places of repose, with suitable seating and shelter (seating rated 18th of 26 aspects – Opinions 2004).

The Herbert Memorial Shelter supports the Playground area well with shelter from rain and the easterly. This is reflected in its high patronage.

The Magnetic Observatory workshop is an unusual building because it appears out of place in the Gardens and thus people are unsure as to whether they are allowed in it. It is of great historical importance, used by Scott for calibration of his instruments on the way to the South Pole. There is the potential for much to be made in the interpretation of this event, and the significance of the adjoining meteorological station. There are also opportunities for sub-Antarctic collections in the Gardens, as a

development of Christchurch's historical linkages with the Antarctic.

The Bandsmen's Memorial Rotunda is a lovely building, in a pristine setting, that is somewhat under-utilised. It may be through a better network of paths that this can become a more desirable venue in the future. The roof dome has never been completed on this historic building.

Other buildings

The Robert McDougall building is to be developed by Canterbury Museum and will form an important seventh entry point into the Gardens. It is likely that this will significantly reduce the number of visitors using the existing Museum entrance into the Gardens. The development of this building creates an opportunity to provide Gardens information at the exit from the McDougall building, along with improved toilet facilities.

6 Riccarton Ave comprises an old residential building intended originally for the housing of Gardens staff, but used in recent times as rental accommodation. The building is in need of deferred maintenance, but is otherwise potentially useful.

The Ex-North Hagley Bowls Club pavilion is a load bearing cavity brick structure that was recently acquired by the Council on the departure of the Bowling Club. A 1999 report by City Design assessed the state of the building with respect to the current Building Act and advised on the process of upgrading the facility for general public usage. Costs of \$345,000 (April 1999) were identified at that stage.

This building and the grounds occupy the southern edge of Victoria Lake. With an expansive northern aspect across the lake, and a backdrop of mature trees, this area is potentially of very high amenity value. At present, the hedging of the grounds severely constricts the use of the southern lake edge. Exclusive club access to the building's grounds need to be reconsidered against the potential amenity that may be obtained by public access.

Potential building opportunities

Circulation

The most pressing problem to be addressed in any building programme is the greater circulation issues of the Gardens.

Vehicle circulation for servicing Gardens buildings, access and configuration of car parking, and intersection design to Rolleston Avenue are cumulatively the single largest problem to be addressed for visitor support.

The location of any new facilities must be part of a greater master plan that creates ultimately a Gardens that can be serviced almost completely without the use of heavy vehicle traffic in the inner river loop. The plan must also address public vehicle access to the entry point and allow for use of new built facilities independent of the Gardens operating hours.

These exterior circulatory conditions must also interact with Hagley Park cohesively and should consider the future development of the Gardens, potentially as a connection between Riccarton and the Central City. Future Gardens' growth and connections to Hagley Park and beyond is presently restricted by roading and car parking to the north, and club occupations to the west.

Interior circulation within the Gardens is largely imposed by the boundary and landform, but needs to be comprehensively reconsidered to extend into any new exterior connections. There is the opportunity to better develop the core of the Gardens around the Conservatories as a tool for orienting visitors. This would especially aid access to collections to the southwest and west, which visitor surveying indicates is presently underutilised (approx 5% of visitors).

Building locations

Given the future bisection of visitor numbers through the Museum entry from Rolleston Avenue, the single most numerous entry point to the Gardens will be associated with the major car park area. Any new visitor facility must be associated with the most popular entry to ensure the maximum potential information distribution at the point of entry.

A number of siting studies were prepared and assessed by consultants and Gardens staff. Potentially the best site for any new facilities would be to the western interface of Hagley Park with the Gardens. This could provide the best circulation conditions, and free up the connection of the Gardens to Hagley Park both to the north and west. However, this conflicts with the occupation by the United Clubs and would be expensive and possibly controversial to effect.

Other viable solutions consider developing the present Botanic Gardens Ca Park configuration, but are ultimately still constrained by vehicle circulation issues due to isolation from the roading network.

Development of visitor facilities to the Rolleston Avenue frontage would be ideal in providing information where it is most desired by first time visitors. However, the impact on the heritage frontage, the segregation of information, staff and yard facilities, and the possible duplication of information provision with the Museum, make this option undesirable.

Location of new visitor facilities within the Gardens, such as the conversion of Cunningham House, could create a centralised focus for visitors. There would still be undesirable issues of vehicle servicing within the Gardens, limited hours of usage, and dissociation of information distribution with entrances. The biggest deterrent would be cost, however, as this would require a new conservatory complex to be built concurrently to replace Cunningham House's function.

Buildings

A brief has been compiled for the built facilities of the Gardens, describing the functional requirements of individual spaces, relationships between spaces, and identifying approximate sizes of areas.

The diagrammatic space plans displayed in Figures 33.1 and 33.2 graphically describe the dual layers of 'processing' of physical materials and customers into and out of the Gardens.

Both of the built mechanisms can operate about a central space, upon which the linear activity of

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33. Buildings

moving in or out of the Gardens can be supported by a number of supplementary, adjacent processes.

The two built facilities are ideally close to one another, as staff from one each need resources from the other. The facilities are both conceived as connections to the Gardens and, especially in the case of the visitor facility, could function physically as a “bridge”.

By designing the visitor facility in such a manner that users are required to pass through it to enter the Gardens, the maximum awareness of available information and complementary functions can be communicated. There are also great opportunities to provide an elevated entry point to orient visitors and potentially create a destination for other functions outside Gardens hours.

Plant / Energy

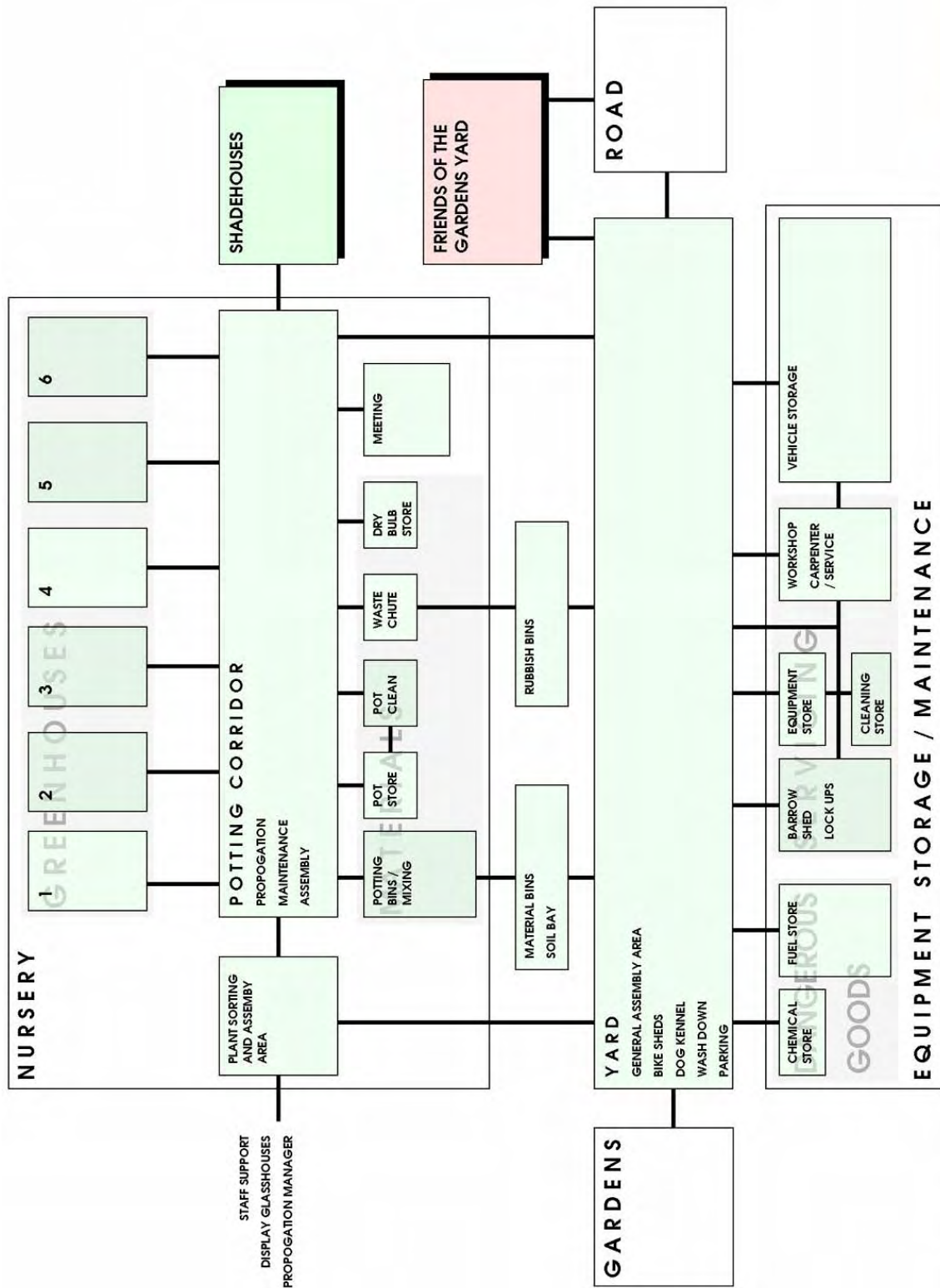
A new boiler is required for the entire facility. There are opportunities to use biomass produced by the Gardens as a source of renewable fuel, producing very low emissions, at a low operational cost. A report commissioned by the Council’s Energy Manager and prepared by Powell Fenwick, considers options and has advised on possible configurations.

Any new buildings have the opportunity to be a showcase for Environmentally Sustainable Design, and potentially a strategy could be put in place to evolve the functioning of the Gardens to have no net environmental footprint beyond the Gardens boundaries.

Table 33.1: Building activity (development / action) priority chart

	More urgent		Less urgent	
	More important	Less Important	More important	Less Important
Cannot be done or completed within existing budget – major capital or operational item			<ul style="list-style-type: none"> ▪ Improved retailing facilities 	
Can be done within existing budget – may often involve attitudinal change	<ul style="list-style-type: none"> ▪ New donation boxes/sites ▪ Niche market plant sales ▪ Trust for funding set up 	<ul style="list-style-type: none"> ▪ Rare plant surcharge ▪ Funding source database 	<ul style="list-style-type: none"> ▪ Exhibition charging ▪ Sourcing local suppliers 	

Figure 33.1: Collection support layout concept – proposed building complex



BOTANIC GARDENS ENTRY PAVILION
SPACE PLANNING DIAGRAM

COLLECTION SUPPORT

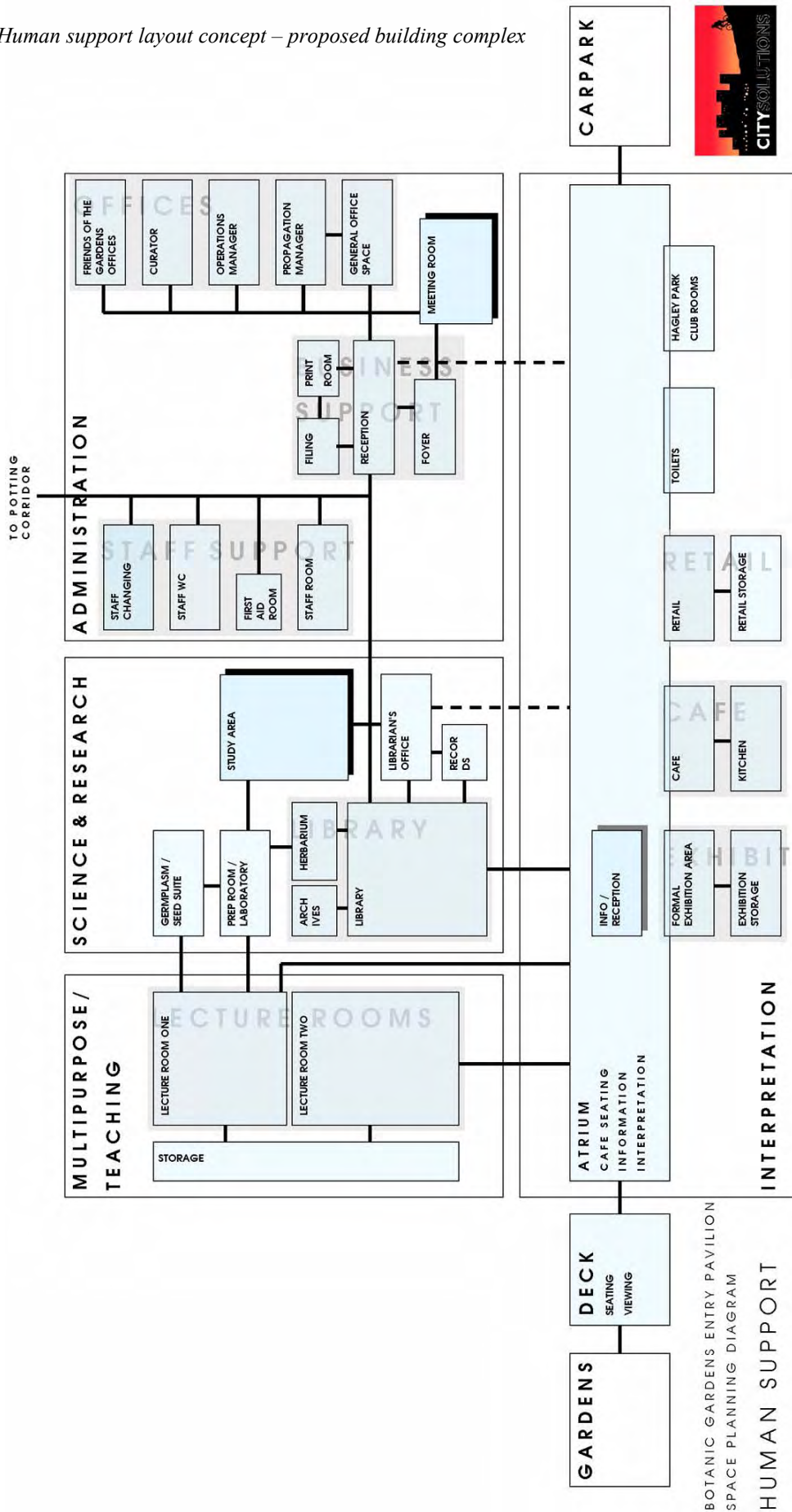


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33. Buildings

Figure 33.2: Human support layout concept – proposed building complex



34. MARKETING

Explanation:

“Marketing” includes promoting the Gardens widely.

Objective:

The Gardens brand is widely disseminated and made known and marketed effectively to known and potential users and among related institutions.

Background

Marketing is about the wide range of activities involved in making sure that an organisation is continuing to meet the needs of its customers, who are getting appropriate value in return for their interest.

Marketing analysis includes finding out what groups of potential customers (or markets) exist, what groups of customers you prefer to serve (target markets), what their needs are, what products or services you might develop to meet their needs, how the customers might prefer to use the products and services, what your competitors are doing, what pricing you should use and how you should distribute products and services to your target markets. Various methods of market research are used to find out information about markets, target markets and their needs and competitors. Marketing also includes ongoing promotions, which can include advertising, public relations, sales and customer service.

Marketing can be thought of as both “inbound” and “outbound”. Inbound marketing includes researching to find out:

- What specific groups of potential customers/clients (markets) might have in the way of specific needs.
- How can those needs be met for each group (or target market), suggesting how a product might be designed to meet the need, including outcomes, or changes, to accomplish among the groups of clients to achieve this.

- How each of the target markets might choose to access the product; for example, its “packaging.”
- How much the customers/clients might be willing to pay and how they will pay (pricing analysis).
- Who the competitors are (competitor analysis).
- How to design and describe the product so that customers/clients will take it from the organisation, rather than from its competitors (its unique value proposition).
- How the product should be identified—its values—to be most identifiable (its naming and branding).
- Identifying key trends in visitor activity at a local and international level.

Outbound marketing includes:

- Advertising and promotions (focused on the product).
- Sales.
- Public and media relations (focused on the entire organisation).
- Customer service.
- Customer satisfaction.

It might be argued that a local body owned botanic gardens does not need to engage in marketing, that it has a captive audience and that the rate payers will see it continue to float. This is especially the case where there is a high level of user satisfaction. It is also assumed that there is an ‘endless’ market out in the community and one only has to increase profile to have more and more people swarming in. Yet, that may not necessarily be true. There needs to be recognition that changes are occurring. For example, there is growing evidence that the homogeneous mass market that is appealing to many gardens is shrinking.

Sometimes it is assumed that because tourism is growing botanic gardens can piggyback off the travel and nature tourism dollars with minimal effort put in by the gardens themselves. This is partly true, but many of these new visitors, although wealthy, are discerning in their choices for spending. There is a need to have available what people want and enjoy, and to ensure that there is a high quality of product presentation.

There is an increasing need to engage in niche marketing or marketing to specific groups of clients. Niche marketing is really about refinement of product.

“A business must differentiate itself in ways that are important to the customer,” notes Philip Kotler, professor of international marketing at Northwestern University. *“A business can actually be more profitable by going for the niche rather than the volume.”* he elaborates.

Markets are also becoming more sophisticated and often more demanding. Nancy Ozawa, researcher at the Institute for the Future in Palo Alto, California, and her peers at this institute, Ian Morrison and Greg Schmid, advise that:

“Anyone connected with the business world must focus time and attention on understanding the driving forces changing today’s business environment.”

Two of those forces are, firstly, the widening and more proficient use of advanced technology and, secondly, consumer expectations of more personal service. These two forces also define the 21st Century consumer.

“Businesses in the next millennium will serve consumers who are more sophisticated and educated,” Ozawa predicts. *“Well over 50 percent will have a high school diploma by the year 2000. Tomorrow’s consumers will also be more demanding and vocal, and will expect companies to meet their needs, and they will use their wallets to vote for the winners.”*

The personal service issue is an important proposition. Ozawa suggests that:

“To succeed in the future, companies will need to focus on their customers and reorganize around their needs. Once this is accomplished, it’s time to get closer to your customers. One way of doing that,” she suggests, *“is to follow up with customers after transactions to find out if they are satisfied.”*

Therefore, it is critical that marketing for the Gardens involves the employment of better monitoring methods.

Branding is another major factor. Focus should be on keeping partners and organisation segments in touch with the needs, emotions and motivations of the consumer. This means determining the “lay of the land”, how best to match brands to market needs and quantify the message to sell the brand (sell being in the sense of determining preferences). It means common language, clear targets, and knowing key features and benefits, as well as defining the rational, emotional, and sensory cues that trigger consumers to purchase or do something. It means developing a ‘road map’ that illuminates the relevant future of a brand, as well as the evaluative tools to keep moving along that road ahead of others.

It is important to distinguish between corporate identity, brand identity, and brand image. Corporate identity is concerned with the visual aspects of a company’s presence. When an institution or a company undertakes corporate identity exercises, it usually means modernising the visual image in terms of logo, design and collaterals. Such efforts do not normally entail a change in brand values so that the heart of the brand remains the same - what it stands for, or its personality. Visual changes, though, will not change the brand image. Changes to logos, signage and even outlet design do not always change consumer perceptions of quality, service, and the intangible associations that come to the fore when the brand name is seen or heard.

The best that such changes can do is to reassure consumers that the institution is concerned about how it looks. Brands do have to maintain a modern look and the visual identity needs to change over time. But the key to successfully effecting a new look is evolution, not revolution. Totally changing the brand visuals can give rise to

consumer concerns about changes of ownership or of possible changes in brand values or even of unjustified extravagance. If there is a strong brand personality to which consumers are attracted, then substantial changes may destroy emotional attachments to the brand.

On the other hand, if the intention is to substantially improve the standing of the brand, then corporate identity changes can be accompanied by widespread changes to organisational culture, quality, and service standards. If done well, and if consumers experience a great new or improved experience, then the changes will, over the longer term, have a corresponding positive effect on brand image.

The Gardens contribution to City values

The Council has identified some key values to describe the kind of society, community, environment and economy the people of Christchurch want to live in. They are those things that the community thinks are important for its well being:

Sustainable Christchurch

- a learning city
- a prosperous city
- a well governed city

Being a city

- with inclusive and diverse communities, with a strong sense of place and identity
 - with healthy and active people
 - which is safe
 - which is cultural and fun
 - which is liveable
- with an excellent built and natural environment

Community outcomes

Sustainability is an overarching theme – that, in achieving outcomes, communities and businesses will protect, enhance and restore natural and social capital to maximize quality of life without undermining the ability of generations to meet their own needs. The Council has developed what it terms ‘community outcomes’ as a basis for the city ethos. This is essentially the city positioning and the Gardens, like every other city institution, needs to ensure that it supports and does not detract from these outcomes in every aspect of its operations.

A sustainable natural environment

- Our people value and enjoy our natural environment and take responsibility for protecting and restoring it.
- Our city’s natural resources, biodiversity, landscapes and ecosystem integrity are protected and enhanced.
- Our economy recognises that our natural environment plays a critical role in our prosperity, and that businesses ensure that negative impacts on the environment are reduced.

A learning city

- Our people have the knowledge and skills needed to participate in society and value lifelong learning.
- Our city provides diverse opportunities for learning and innovation.
- Our economy thrives on skills, knowledge and innovation.

A prosperous city

- Our people have access to adequate income and opportunities to contribute to the city’s well-being.
- Our city has the infrastructure and environment to support a job-rich economy, while protecting and enhancing our essential natural capital.

- Our economy is based on a range of businesses, which enable wealth creation and employment opportunities for all.

A well-governed city

- Our people participate in decision making and enjoy the rights and responsibilities of living in a democracy.
- Our city's infrastructure and environment is managed effectively, is responsive to changing needs and has a focus on long term sustainability.
- Our economy thrives on strong, proactive and ethical leadership.

Inclusive communities

- Our people participate in community life, have a sense of belonging and identity and have opportunities to contribute to city well-being.
- Our city encourages a diversity of lifestyles, a sense of social connection, place and identity.
- Our economy provides opportunities for all people to participate in wealth creation, develop a sense of belonging and make a contribution.

Healthy and active people

- Our people live long and healthy lives.
- Our city provides the natural and built environments that enable people to enjoy long and healthy lives.
- Our economy is based on practices that promote and improve health.

A safe city

- Our people are free from crime, violence, abuse and injury.
- Our city's urban form and infrastructure maximises safety and security for all people from crime, injury and hazards.

- Our economy invests in mitigating against threats to safety and security.

A cultural and fun city

- Our people value leisure time and recognise that arts and leisure pursuits contribute to identity, connectedness and well-being.
- Our city's infrastructure, facilities, open space and natural environments support a diverse range of arts and leisure activities.
- Our economy is strengthened by the arts and leisure sectors.

A liveable city

- Our people have appropriate housing and live in attractive and well designed neighbourhoods and city.
- Our city provides a choice of housing, easy mobility and access to open spaces and a range of utilities that allow people to enjoy an acceptable quality of life.
- Our economy invests in and benefits from enhancing the liveability of our city.

Partnerships

- Our partners work together to ensure appropriate and integrated responses to community issues and needs.

When the above community outcomes are examined it becomes apparent that probably every one is relevant to the Gardens. This is especially the case when the Gardens are considered in conjunction with Hagley Park.

It is probably more among private botanic gardens than publicly owned ones that one tends to see the outworking of branding and marketing, perhaps because these are the botanic gardens that will not be bailed out if things go wrong. A good example is Butchart Gardens in Victoria, BC, Canada, which was established in 1904 when Robert Butchart, a cement maker, exhausted the limestone in the quarry near his family home. His enterprising wife, Jennie, conceived an unprecedented plan for refurbishing the bleak pit

that resulted. Today Butchart Gardens is seen by over a million paying visitors and is world famous for its dazzling floral displays.

It is important that local body gardens such as Christchurch's Gardens are not operated on the basis that there is a 'bail out' option, but rather as if they were self-sufficient, at least in terms of maintaining originality, innovation and quality standards. Public gardens in New Zealand are in direct competition for the tourist's time (and some local residents) with private enterprise.

Requirements for improved market position for the Gardens

- A carefully crafted strategic marketing plan for the Gardens that takes account of the peculiar nature of botanic gardens should be prepared.
 - There needs to be a firm commitment to an objective to increase the number of visitors using the Gardens - such a commitment might make it easier to secure more resources in the future.
 - Key target markets should be clearly identified, including both those that presently use the Gardens, as well as new markets.
 - It needs to be decided how vigorously the Gardens should pursue new customers and profile itself as being 'the' premier attraction in Christchurch, and to what extent joint marketing is sought, for example, with the Cultural Precinct.
 - It is important if the Gardens is to continue to meet the needs of its visitors, it is important that there be good design and implementation of monitoring and evaluation.
 - There is need to look to new and innovative opportunities for attracting visitors, as well as to build on existing advantages.
 - Opportunities should be taken to increase the value of experience for existing (present) users.
- Special projects should be planned for and promoted, taking into account that some could involve approaches to specific corporates or individuals with an interest in the project subject.
 - A special privilege association with the Gardens should be considered for donors. For example, through the Friends of the Christchurch Botanic Gardens structure it could be determined if there ought to be differing level of membership based on a range of privileges.
 - The Gardens needs to be serviced at all times by a team of client-friendly staff, using the correct tools for the job.
 - The web pages for the Gardens need to be attractive and informative, easy to navigate, innovative, with staff contact information and good links to other relevant sites.
 - Good media exposure is an invaluable marketing tool and needs to be vigorously pursued, taking account of the fact that there are many different aspects of media coverage, which each have their own uses and characteristics.
 - A vigorous marketing strategy should permit the minimisation of chance conditions and externalities so that the major drivers of market results are controllable.

Review of issues

The special niche of botanic gardens

Botanic gardens are unique institutions and, as such, they have their own special branding and marketing needs and niches. There is nothing else quite like a botanic garden, and although one can (and should) use principles from commercial businesses, museums and art galleries, tourism, and so on, not one of these will provide the template. One of the dilemmas for botanic gardens is to determine just what their catchment of clients is. It is easy to simply see the clientele as the general public who walk in the gates to admire flowers, sit under shady trees, enjoy water, and (if young enough) play in the playground. The client base, though, extends far beyond these

people. It potentially includes the education system, conservation interests, science centres and universities, commercial horticulture and many other interest groups.

This issue is discussed in a marketing plan prepared for the Gardens in 2000, which pointed out that:

“...without doubt the fundamental concepts of recreation and enjoyment for the people of Canterbury were the overriding concerns of the City Fathers when they set aside the garden area.

...However, a by-product of this focus is that people now visit the gardens predominantly for exercise or a walk to sit and enjoy the environment. Whilst the gardens continues to cater for the horticulturally inclined, there is room to lend an ear to visitors seeking time out or ‘education’ in the form of ‘home gardening’ questions. ... Toss out any old-fashioned perceptions by positioning The Gardens as ‘the ultimate re-energiser.’

The great variety of roles that is possible for botanic gardens means that strategic planning is crucial if individual gardens are to develop beyond just being fancy and decorative parks for the multitudes. There must also be very deliberate choices regarding such activities as display, education, tourism, conservation and entertainment. All are possible, but botanic gardens can easily become a hotch-potch of uncoordinated and frenzied activity as they try and appeal to every person and group in the community. One of the essentials for botanic gardens is careful and appropriate strategic planning which must include:

- A vision - each botanic garden is unique and this should be reflected in the vision.
- Recognition of the importance of participation (consultation) within and outside the organisation in the production of a strategic plan.
- A plan that is specific, with focused, achievable and measurable outcomes.

- Facilitating good links between budgets, action plans, ownership and accountability.

Marketing and branding botanic gardens

Although often regarded as promoting or advertising a product, there is much more to marketing than this. Essentially, marketing is about the five ‘p’s: people, product, position, price and promotion:

- People -** The culture and blend of skills and key market trends.
- Product -** Quality and development of facilities and services.
- Positioning -** Targeting products to particular consumer groups.
- Pricing -** Ensuring that the products are matched to the target group’s expectations.
- Promotion -** Communicating key messages and availability of the products.

The view of some proponents of marketing is that it should be embedded within the structure and expertise of the organisation; that is, in the case of botanic gardens, it is the responsibility of botanically and horticulturally trained managers rather than consultants or others who are not fully familiar with the nature of the botanic gardens business.

In this sense, marketing is therefore a core component of the proper management of botanic gardens, allowing focus on what is special about the marketing niche that they occupy.

Another viewpoint is that marketing is a specialised adjunct to the botanic gardens operation that requires standards and methods that may not be available to the gardens alone.

Some recent conferences have focused on market research being an important part of building a brand. Examples of botanic gardens that have engaged in this include the New York Botanical Garden and Phipps Conservatory and Botanical Garden. Building an effective brand is used to move an institution to a desirable position in so far as programmes and funding is concerned, but this needs to be monitored and assessed closely.

Some general conclusions are that:

- Botanic gardens need marketing and brand development.
- Expertise in botanic gardens is scarce, although this is changing.
- The marketing needs and opportunities for botanic gardens should be higher on the agendas of international botanic garden networks.

A useful analysis of New Zealand tourism and marketing in botanic gardens is provided by Ngan and Sleeman. They point out that an analysis of the roles of botanic gardens in New Zealand indicates that leisure, tourism and recreation are seen as secondary to other gardens functions and are difficult for some staff to grasp. They suggest that this may be related to a lack of tourism know-how within botanic gardens, insufficient resources to promote a garden as a tourist attraction and a lack of marketing personnel. Key factors for success from a marketing perspective are:

- Information before a visit.
- External appearance and attractiveness of the entrance.
- Ambiance and motivation provided by reception areas.
- The admission process itself and any orientation provided at the start of the visit.
- The attraction's circulation network.
- Quality of interpretation and displays, especially the level of a sense of involvement and participation that is provided.
- Quality of facilities such as catering, toilets and for education.
- Attitudes of, and level of welcoming by, staff.
- Overall feeling of satisfaction and value for money that visitors feel, which will influence their recommendation to potential future visitors.

- Strong values and direction being promoted.
- Opportunities for access in terms of transport infrastructure and catchment area characteristics.
- Ongoing investment in the updating and developing new facilities as part of product life cycle planning and management.
- An adequate cash flow.

At the policy level there needs to be a firm commitment that one of the objectives for a botanic garden should be to increase the number of visitors using the various elements which make up the total attraction. The above authors comment that they did not see this obviously stated in any of the information gleaned from New Zealand botanic gardens, but suggest that such a commitment might make it easier to secure more resources.

Although there is a need to look to new and innovative opportunities for attracting visitors, it is also important to build on existing advantages to stimulate commercial opportunities, generate media interest and reinforce particular themes. For Christchurch's Gardens, such advantages include:

- Expert and experienced staff.
- Environmentally attractive facilities.
- A location close to the Central Business District.
- A large existing base of customers.
- A reasonably large land area surrounded by the substantial green open space area of Hagley Park.
- Well known to the community and already a source of local pride.
- With free entry and access to facilities.
- Being part of a cultural precinct.

Marketing, if taken seriously, requires good resourcing. The current lack of focused marketing

resources means missed opportunities and limited capacity to fully exploit any that are achieved.

It needs to be decided how vigorously new customers for the Gardens should be pursued and if it should be profiled as being 'the' premier attraction in Christchurch. This was recommended in a 2000 marketing review, but since then the trend has been to seek joint marketing - for example, with the Cultural Precinct. The development of a distinctive logo has been achieved, but this needs to be developed to achieve suitable guidelines, recognition and consistent use within the Gardens. The contention of the 2000 report that the Gardens does not have the profile within the tourism industry that one would expect is true (an impression given from viewing tourism websites). On the other hand, it is apparent from survey results, discussions with tour operators and visits by distinguished guests and media agencies (for example, film and video companies) that the Gardens does enjoy a high profile in some quarters.

Key target markets

Botanic gardens have a diversity of functions and there are a number of very diverse audiences or sets of clients that they serve. Key target markets need to be continually monitored and identified.

Key targets for the Gardens of Christchurch are:

- Local residents -** The Gardens, along with Hagley Park, is the city's premier green space.
- Botanical groups -** Institutions and groups who recognise and agree with botanical aims.
- Visitors to Christchurch -** The Gardens is one of the top three tourism attractions within Christchurch.
- Partner organisations -** Those organisations connected with promoting increased visits to the area and those whose key messages match those for the Gardens.

There is no doubt that new target markets exist and should be secured, although this has to be balanced against ensuring increasing satisfaction among existing users. As suggested in the 2000 marketing review:

Whilst those who live close by, older people and families are frequent users of the Gardens, there are other segments of the population that are under-represented and who may view the Gardens as old fashioned and boring. The next research study could cover perceptions among different age groups to identify how the Gardens can keep up-to-date for future generations.

The suggested angle is to increase experience value for present users. Catering for the 50 % of visitors who are gardeners is an obvious way of doing this and there are a number of steps that can be taken to facilitate this, some of which have been initiated to some degree or are under discussion:

- Greater use of the information centre as a garden resource centre.
- Information provided on gardening issues, such as hard copy, video and web-based information.
- Part of the website being dedicated to gardening issues.
- Partnering with Canterbury Horticultural Society and/or related organisations to present coordinated courses, training and 'master classes.'
- On-line touch-screen facilities for the general public to access information on cultivated plants.
- Becoming 'the' garden bookshop for Christchurch.
- Links with Canterbury horticultural specialists, nurseries, plant breeders and wholesalers, especially to present pre-release cultivars.
- Sale of heritage seeds and plants through liaison with heritage organisations, such as Southern Seed Exchange.

Special projects and innovative new developments

A key attraction can be special projects. This has been used by some large botanic gardens,

especially in the USA where there are often associated opportunities for naming rights. As an example, the policy of Chicago Botanic Garden has been to have a grand fiesta opening of a new facility. At the opening, the concept plans of the next project are prominently displayed and in the euphoric atmosphere of the opening the gardens director is approached by people interested in helping fund that next project.

Some special projects lend themselves to approaches to specific corporates or individuals with an interest in the project subject. An example would be an ethnic garden being established in the Gardens. It is worth noting that many who emigrate to New Zealand are looking for some way to say thank you to their new host country and this can include botanic gardens. A key project issue is to work at least one project ahead in terms of scoping, concept plans and costs.

A recent special project has been the remodelling of the Gilpin House for orchids. Other special projects suggested include the following:

- Make-over of the fern house in conjunction with the Mona Vale fernery.
- A series of home style gardens (but avoiding a copy of Hamilton Gardens' garden history sequences).
- A new Mediterranean garden, perhaps combined with a redeveloped sensory garden.
- A children's exploratory garden, gnome collection and children's small amphitheatre.
- Redevelopment of the bonsai collection.
- A large scale development of a 'Gondwana Garden.'
- Expansion and redesign of the threatened plants garden.

An important consideration for special projects is manipulation of the core product to ensure best fit within key markets and the identification of champions for the botanic gardens; that is, benefactors. There is also a need for professional conduct on the part of the gardens – such things as ensuring fit within the garden product, respecting

wishes of donors and having the final say on what is placed within the gardens, as well as delivery of projects on time.

Special privilege associates

This is something that has not been considered for Christchurch's Gardens to date. A perusal of botanic garden websites in New Zealand indicates that bequests and donations are either not mentioned or are very low key. Yet, overseas botanic gardens often recognise that caring for key donors and people with a special interest in the botanic gardens is critically important. It has been noted for Chicago Botanic Garden that donors play a very important role, both on an annual appeal basis and for special capital campaign development drives. Chicago currently has a number of levels of membership related to annual donor levels:

Friends' Circle	\$150 - \$249
Contributors' Circle	\$250 - \$499
Director's Circle	\$500 - \$999
President's Circle	\$1000 or more

The Chicago Botanic Garden also widely advertises a range of options and opportunities for planned giving, tribute gifts and pledges. The Royal Botanic Gardens, Sydney, has a similar additional recognition of donors as Friends with Gold, Silver or Bronze Waratah members. At the Royal Botanic Gardens, Melbourne, the Director's Circle honours and recognises donors who make annual unrestricted gifts of \$1,000 or more. Members of the Director's Circle enjoy exclusive behind-the-scenes tours and presentations, meet expert staff and have the opportunity to become involved in future plans and developments at the gardens.

The Friends of the Christchurch Botanic Gardens' structure could be looked at to see if there ought to be differing levels of membership based on a range of privileges. In a practical sense, such a system is unlikely to be able to be actioned until new buildings have been put in place.

Marketing tools

Printed material, telephones and websites are important 'first encounter shop fronts' for people

who are interested in an institution like the Gardens.

A clear hierarchy and structure is needed from all printed information. This information should cover the full range of opportunities and knowledge contained within the Gardens, from external promotions on the Gardens location to in-depth botanical articles. It is also important to consider the distribution of such publications to ensure maximum effectiveness and a low level of waste.

The modern tendency is to increasingly use recorded telephone systems as the front line response. These are of highly variable quality and, while they are useful for providing routine information such as costs, opening and closing times, anything that requires more than routine repetitive information must be able to be transferred with minimum delay to a real human being. Most members of the public do not like to listen for several minutes being told “...do not hang up – you will be answered by the first available customer help - your call is valuable to us”.

A dedicated website is an automatic expectation for a botanic garden. Good website design is an art. The site needs to be attractive and informative, easy to navigate, with staff contact details and links to other relevant websites. Graphics are good, but it is frustrating when it takes a long time to open the site because these are excessive. Some of the innovations for a Gardens website (there are presently Botanic Gardens pages on the Council’s website) that should be considered are:

- A section on ‘What is new’ is essential and must be updated at least weekly.
- Consideration should be given to downloadable ‘gifts’ such as screen savers and games.
- The whole site should be updated every month so that not only individual people, but tourism and horticultural interests come back to the site frequently.
- Information sheets, articles and files are downloadable as Word or PDF files.

- Easy basic navigation and pages that come up quickly on the screen.
- Up front contact information that says who does what and who to contact.
- A ‘FAQ (Frequently Asked Questions)’ section.
- Good, fast hyperlinks to allied sites, such as other botanic gardens, Christchurch City Council, Environment Canterbury, Royal New Zealand Institute of Horticulture, relevant New Zealand networks and tourist attraction sites.
- There is the opportunity to print maps and guide brochures from the website.
- Includes botanical and horticultural information.
- A section on ‘plant thoughts’ for people who want pithy and meaningful sayings.
- Host site for the Friends of the Gardens (with dedicated contact details and on-line membership form), and possibly other allied organisations, for example, the Canterbury Botanical Society.

While websites do not constitute a magic solution to marketing and communication problems, well constructed sites are increasingly used by the public. People are now becoming more discerning on their use of sites. One of the very spectacular examples of a good website that has broken into ‘the big time’ is that of the New Zealand Plant Conservation Network. In its first year of operation it has logged over a million visits and is the top plant website for most web search machines. Another well constructed site is that of the Royal New Zealand Institute of Horticulture.

Media exposure

Media coverage is important for any organisation. There is a delicate balance between overkill where the media is flooded with information and views and nobody notices and being the ‘best kept secret’ and nobody knows! Media is simply the form and technology used to communicate information in whatever form. But ‘the media’ is

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- PART IV ISSUES AND ACTION PLAN -

34. Marketing

generally taken collectively to refer to communication through public information sources, such as newspapers, magazines, radio and television. In New Zealand, these reach the majority of New Zealand people. The average New Zealander spends 170 minutes a day watching television and 98% of homes have a colour television, over 60% go to the cinema at least once every six months, 55% read a daily newspaper and 80% read a paper weekly. Among

magazines, Women's Weekly reaches almost 30% of the population, AA Directions over 27%, and Home and Garden almost 20%.

What this translates into is that media exposure is very valuable marketing. There are, however, many different aspects of media coverage that each have their own uses and characteristics:

Medium	Type of exposure	Advantages / Disadvantages
Newspapers	Gardening page one-off feature articles	Good short-lived exposure on specific items. Usually involve face-to-face interviews; depend on editorial interest.
	Gardening feature items	Can be a regular item (for example, monthly) and useful to say what is going on, especially seasonally; highly controllable.
	News items	Needs something that is newsworthy, and competes for space with other news; high exposure, but little control on content.
	Feature items	Needs an issue (so must be newsworthy) and often face-to-face interviews, but variable level of control of final content and often looks for controversy.
	Letters to editor Advertising	Short and often contentious, but have a place. Varies from large paid or sponsored pages to small advertisements; full control on content but it costs!
Radio	News items	Often these days by telephone, sometimes live, short, and no control on content.
	Talk-back	Good if the opportunity arises and often to an interesting and diverse audience; needs good communication skills and quick thinking.
	Longer interviews and documentaries	Rare, but satisfying and can structure to suite the person being interviewed; message can be highly controlled.
	Notice boards and diaries	Good for brief announcements.
Television	News items	Has to be pretty important and/or sensational even for local TV; no control on content.
	Features and documentaries	Very rare and require people with high level of skill and personality, but if achieved is the 'icing on the cake.'
	Local TV notice boards and diaries	Can be good for brief announcements, but poor audience coverage unless targeted marketing in association with particular ethnic/age groups.
Cinema	Advertising	Misses tourists and may hit audience who already know about the site.
Magazines	Articles	Targeted articles in the right magazines; for example, gardening and tourism/holiday publications can be a great market generator, but must be well written and inviting; usually some control and editing possible.

Another form of media coverage that is important for marketing is advertising of existence and events in tourism publications and on tourist video clips used in hotels. These are useful avenues although sometimes the expense may outweigh the advantages and there is usually some loss of flexibility and control over content.

Reducing externalities

One of the problems for marketing is to try and reduce the externalities and to control information flows, visitor experience and evaluation. In part, this is a matter of continually monitoring, creating and recreating benefits rather than relying on those already existing, and in part it is ensuring that one is not hopelessly controlled by externalities over which one has no influence. Crocombe et al., developed a diagrammatic system linking the following influential factors in any marketing strategy:

- Government (for the Gardens, local government).
- Firm strategy, structure and rivalry.
- Related and supporting industries.
- Demand conditions.
- Factor conditions.
- Chance.

Their contention is that one should try and reduce the chance conditions and externalities so that the major drivers of market results are controllable. This means determining for the market what it wants rather than being continually driven to do things (reactive) because the market has demanded what is not being done. To some extent, the Gardens' product should be monitored and adjusted to meet the market's desires, but this should lead to a motivation and merging of the Gardens' own ultimate messages. The process is two way, but definitely not just a case of the Gardens responding continually to external pressures.

There is no disputing that the Gardens, although they have a large client base, are in competition with other institutions - public and private - for

people's time and dollars. At the same time, the Gardens have a unique mix of characteristics that should determine its particular niche. An important component of this is quality delivery of all services to the public not only by the Gardens but also by its associates including the Friends and concessionaires.

A marketing strategy

Goal 35: *To develop a long term marketing plan for the Gardens that reflects its key objectives and market.*

Action 35.1: Develop a marketing strategy.

Action 35.2: Seek appropriate forms of customer feedback to monitor customer expectations.

Action 35.3: Undertake market research as appropriate.

35. RISK MANAGEMENT AND BUSINESS PLAN

Explanation:

The “Risk management and business plan” is about ‘doing good business’.

Objective:

The Gardens will identify and isolate, and minimise risk to people, property, and assets and provide for a safe work environment.

Introduction

The Gardens are administered as part of the Christchurch City Council, and sits in the City Environment Group of the Council. Council policies and procedures are part of the overall management of the Gardens. The Botanical Services Operations Team that is responsible for the management of the Gardens is required to adhere to corporate management procedures and practice as well as any legislative requirements in the administration of the Gardens.

Risk management deals with the possibility that some future event will cause harm. It provides techniques and strategies to manage for risk.

Risk management is important in:

- Protecting people’s safety, including staff, volunteers and visitors.
- Protecting the Gardens from legal liability.
- Providing better information to make decisions.
- Enabling better asset management and maintenance.
- Improving the perception of the Gardens among stakeholders.

Responding to any uncertainty about a future event that threatens the Gardens ability to meet its vision and achieve its goals and objectives.

Some examples of risk are:

- Physical injury.
- Failure of machinery or equipment.
- Breach of security.
- Fraud.
- Litigation.
- Customer dissatisfaction.
- Unfavourable publicity.

The systematic application of management policies, procedures and practices to the tasks of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risk.

Treatment of potential risk

Once risks have been identified and assessed, all techniques to manage the risk fall into one or more of four major categories:

- Transfer.
- Avoidance.
- Reduction (Mitigation).
- Acceptance (Retention).

Botanical Services business continuity plan

Plan objectives

This plan is designed to provide reference to that information required by Botanical Services Operations Team staff to ensure business is continued as effectively as possible after any incident which might disrupt normal business operations. The plan aim is to minimise the financial and operational impacts of any such incident.

The plan focuses attention on the impact of an incident, NOT the cause. The plan assists the team to address a full range of possible impacts including, but not limited to, the following:

- Denial of access to building.
- Loss of key personnel.
- Network Server failure.
- Loss of power to building.

Whatever the crisis, the aim of business continuance should be to minimise the extent and duration of the disruption.

The objectives of the business continuity plan are to:

- Provide for a response immediately following an incident.
- Provide a mechanism for resumption of essential services as soon as possible after an incident, at an alternative site if necessary.
- Re-establish business and services to the level expected prior to the incident.

The ongoing responsibility for maintaining and managing the plan and distributing changes lies with the Transport and Greenspace Unit Office Administrator and the Botanical Services Operations Team Manager.

Maintenance responsibilities include:

- Managers will be asked annually to ‘sign-off’ the appropriateness and adequacy of the information contained in the business continuity plan.
- Regular updating of the plan to take into account additions or changes to existing business functions, procedures, equipment, facilities and personnel.
- Distribution of changed pages or documents.

- Liaison with other business continuance planners; for example, with Information Management and Technology, and Corporate Assurance.

Reduction of risk is the first priority, followed by readiness to respond to events. This involves necessary training and testing, and evaluation and review processes.

Immediate response

The response phase includes safety, assessment of damage, security and communication with Gardens staff, key Council personnel and the public. Primary to this is the continuation of key tasks using contingency plans. Response procedures are made in accordance with the impact that has occurred.

Following an incident, the priorities are as follows:

1. Ensure the safety of staff and public immediately, following the Building Evacuation Plan (if necessary).
 2. Carry out a quick damage assessment to determine the extent and severity of the event.
 3. Take appropriate steps to reduce further losses where applicable. For example, turn off water if pipes are broken.
 4. Secure the premises and business assets, including records where possible.
 5. Notify the Unit Manager (or delegate) or Team Leader of the situation.
 6. Activate contingency plans and communicate with all Unit staff (particularly those who are not at the premises) any actions/reporting requirements.
 7. Liaise with key contacts in the Council as appropriate.
 8. Arrange for all personnel to wear staff identification when re-entering the building (if it is safe to re-enter).
-

9. Communicate with the public/media on the loss of service and provide a forecast for when the service will be restored.

The plan lists potential risks, including fire, infrastructure (such as electricity and water) breakdown, communications, acts of wilful damage, computer records, natural events (such as storms and high winds), essential staff, access issues and contractor incidents, amongst others.

Also listed within the plan are details of staff contacts, corporate guidelines, insurance policies, human resources team information and chaplain / staff support services.

Elements of the business continuity plan include:

Biosecurity threats

- Weed liaison group.
- Some specific weed/site strategies in place, including monitoring programmes.
- Programmes for spraying/harvesting of certain weed pests.
- Education of field staff/contractors to recognise new pest threats.
- Programmes for dealing with animal pests based on monitoring outcomes.

Asset planning

- Review of asset management plans and creation of linkages to financial information.
- Consolidation and rationalisation of asset databases.
- Developing policy/practice guides for use of public spaces by others.
- A number of strategic plans for assets in progress.

Injury to staff or public

- Green space contractor has checklist of items to be inspected as part of regular maintenance.

- Health and Safety management plans for staff work sites.
- Rural Fire and Safety facilitator responsible for promoting Transport and Greenspace Unit compliance with health and safety procedures for staff.
- Regular meeting of Health and Safety Team.
- Contracts specify Health and Safety practices.
- Checking system for park facilities is operated to ensure safety of public.
- Inspection programme for street trees to identify hazards.

Adverse natural events

- Currently only a Council Engineering Headquarters Manual is in place.
- Civil Defence plan is being revised.
- Draft adverse events plan exists, although further development needed.

Contractors

- Schedules of work and set standards.
- Contractor carries out self audits.
- Revising and consolidating current asset databases.
- Further work to be done to develop partnerships with contractors.

Financial management

- Standard Council wide processes around monthly and six monthly reporting.

Monitoring of the activities in the Gardens, and regular evaluation of its operations and development, will be undertaken to ensure that the Gardens is efficiently and effectively serving its clients, meeting its vision and avoiding undue risk to its collections and activities.

There is database and electronic software incompatibility; for example, between Web Map (used for the asset management system) and CAD (computer assisted design) systems used for landscape development and construction of new maps for the Gardens. At the present time there is a risk of data inconsistency, double handling, the proliferation of parallel systems that cannot 'talk' with each other and problems for tree maintenance contracts.

Business plan

The City Environment Group has compiled an asset management plan and asset management process for the Transport and Greenspace Unit. The Botanical Services Operations Team has one staff member dedicated to the collection and revision of asset data. The information is collected within Confirm, a software program that is currently used for asset data collection. The asset management plan is being developed with this information.

The asset management plan will identify items in the Gardens that need further development. The items listed below are the beginning point of a comprehensive plan and level of service for the Gardens.

Compliance with the Parks and Waterways Access Policy and with New Zealand Standards.

It is important that there is unimpeded access for most people to the Gardens and the facilities located within it – this is one of the major objectives to achieve and maintain.

User comfort and enjoyment.

Provision of park furniture for user comfort will be achieved with seating that is conveniently located within popular areas of the Gardens and with the provision of picnic tables.

Provision of drinking water for visitor consumption.

It is desirable that free drinking water is available throughout the Gardens.

Provision of toilets within the Gardens.

Three toilet facilities are available and cleaned at least once a day.

Level of community involvement in Gardens management.

Support volunteers participating within the Gardens to a level of at least 500 hours each year (this level is currently being attained).

Opportunities are available to engage in Gardens management.

At least two partnerships are engaged in each year.

An aim of the business plan is to deliver economically and environmentally sustainable stewardship of green space and waterways to provide an enhanced quality of life for people.

External drivers and influences include:

- Legislation.
- Local Government Act (Asset Management Plans (AMP), and Long Term Community Consultation Plans (LTCCP)).
- Resource Management Act.
- Health and Safety Employment.
- Rating Powers Act.
- Reserves Act.
- Political climate.
- Election cycle times, political influences, political complexity and diversity expectations.
- New direction/expectations.
- Rapid change.
- Human resource management.
- Accelerated city growth.
- Impact on resourcing.
- Rating impact.
- Urban sprawl.
- Infrastructure constraints.
- Water and air quality.
- Contract management and performance.
- Development of performance based contracts.
- Technology and information systems.
- Training and skills, process and information.
- Resources and capability of other internal Council Units.
- Staff retention, skill base and qualifications.
- Customer responsiveness.
- Customer expectations.
- Levels of service increasing.
- Community engagement.
- Demographics and changing expectations.
- Informal recreation/recreation trends.
- Urban/rural experience shift.
- Asset profiling.

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- Ageing trees.
- Ageing networks.
- Usage patterns.
- Biodiversity/biosecurity.
- Cultural influence and awareness.
- Kaitiakitangi protocols.
- Tangata whenua consultation.

Critical success factors

Critical success factors for the Unit and the Teams affected by the business plan are:

PEOPLE

- Effective communicators.
- Emotional intellect, as well as technical competency.
- Work environment/trust and openness.
- Professionalism.
- Highly skilled and matched to position requirements.
- Adequate resourcing.
- Self accountability.
- Role definition and purpose.
- Culture of high achievement and accountability.
- Passion and constant improvement.
- Appropriate expertise.
- Work environment/trust and openness.
- Self responsibility.

PROCESSES

- Relevant, current and accessible.
- Clearly communicated and reinforced.
- Continuous improvement/kept updated.
- Key processes documented.
- Completion and implementation.
- Change adaptive/continuous improvement.

RESOURCES

- Effective financial management.
- Links to corporate resources – Information Management and Technology, Procurement, Finance and other corporate units.
- Information systems/data management.
- Quality of physical environment for all areas.
- Leading edge technical equipment – utilising GIS/GPS/Webmap.
- Effective resource allocation.

RELATIONSHIPS

- Political interface/support/advice/clarity of purpose.
- Effective work in cross-unit context/corporate team.
- Effective relationships and communication with the community.
- Connect with and partner with other agencies and planning mobilising the community – LTCCP/ Local Government organisation/ trusts/ MDE/ Environment Canterbury.
- Building community capacity through participation and empowerment.
- Improved customer responsiveness.
- Iwi consultation/understanding.

ASSETS

- Provided in accordance with community agreed levels of service and technical standards.
- Legislative requirements.
- Effective and sustainable asset management – lifecycle management.
- Provide a safe environment (physically safe, safe to use – safe policy).
- Contribution to the four dimensions of welfare (social, economic, cultural and environment).
- Align assets to the four dimensions of welfare.

PLANS

- Clear plan hierarchy.
- Integrated with other planning initiatives; aligned with other plans.
- Accessible and informed.
- Innovative and leading edge planning.

LEGISLATIVE FRAMEWORK

- Adequate and appropriate legal support.
- Decisions and recommendations are aligned with appropriate legislation.
- Meeting statutory timeframes.
- Practices and deliverables are aligned and governed by current applicable legislation.
- Knowledge and awareness of all legislation.

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35. Risk Management and Business Plan

The business plan identifies the services the Botanical Services Operations Team are required to deliver:

- Implement over the long term the Gardens vision.
- Maintain the Christchurch Botanic Gardens Management Plan and ensure the asset management plan is followed.
- Ensure tree protection and development for the Gardens.
- Ensure trees are maintained, removed and replaced following the asset management plan, and maintain a tree database.
- Contribute to initiatives and policies that enhance Christchurch as a premier 'garden city.'
- Participate in Council initiatives on issues such as controlling weed species, protecting endangered plant species, open space strategy, biodiversity and sustainability.
- Maintain a database of plant names and information.
- Develop and maintain a herbarium.
- Establish scientifically based plant collections.
- Carry out research and trial new ways of doing things.
- Arrange seed collection.
- Carry out plant identification.
- Practice sustainability and biodiversity.
- Trial alternative methods; for example, no sprays.
- Demonstrate plant communities.
- Educate and distribute information, such as brochures and articles.
- Run tours, special events, surveys and reviews of visitor services.
- Grow all plants needed in the Gardens, including replacement plantings, and design all bedding displays.
- Budget and programme capital works, and ensure completion.

Specific projects

- Review of effective marketing and information provision for the Gardens.
 - Capital programme implemented, resulting in infrastructure and amenity enhancement.
 - Gondwana collection planned and implemented.
 - Enhancement of educational and amenity values.
 - Irrigation planning and design aimed at a decrease in operational expenditure.
 - Asset budget review aimed at protecting assets from degradation and decline.
 - Administration process review – to cover improved internal processes, record keeping and administration.
 - Plant collection and accession records collated, increasing the accuracy of records and scientific data associated with the plant collections.
 - Review of the Gardens tree infrastructure, resulting in the continuous improvement of tree stock.
 - Interpretation and signage policy document formulated, resulting in improved customer service and delivery.
-

A risk management and business plan strategy

Goal 36: *Provide for the continuous business improvement in performance to meet customer expectations.*

Action 36.1: Signage provided for two notable collections for public identification.

Action 36.2: Produce and maintain information on the Gardens in at least six different publications.

Action 36.3: Provide and maintain signs at the entrances and inspect monthly.

Action 36.4: On-site information is provided in at least three languages other than English.

Action 36.5: All new designs or re-designs are subject to Safer Canterbury Guidelines and a safety audit.

Goal 37: *Provide a safe environment for staff and visitors.*

Action 37.1: All new playgrounds to meet New Zealand Standards and existing playgrounds modified to meet these standards at time of renewal or upgrading.

Action 37.2: Upgrade 120 metres of paths in the Gardens per year to meet the Parks and Waterway Access Policy.

Action 37.3: Undertake emergency response within two hours of notification of an immediate health and safety risk.

Action 37.4: Staff are trained and kept up-to-date in First Aid, and First Aid personnel are designated.

Action 37.5: A health and safety team is retained on the Gardens site, and hazards are continuously monitored and newly identified hazards responded appropriately to.

Action 37.6: Hold an induction programme for all staff and volunteers.

Action 37.7: Have weekly inspections of play equipment.

Action 37.8: Seek to achieve a greater than 9.2 out of 10 average rating (excellent) for visitors feeling safe using the Gardens.

Goal 38: *Provide for continual asset improvement and protection.*

Action 38.1: Implement an annual maintenance programme for fountains, clocks, statues and art works to maintain their condition and prevent deterioration.

Action 38.2: All work carried out will need to comply with conservation plans and the Christchurch Botanic Gardens Management Plan.

Action 38.3: 100% compliance with resource consent conditions for work on notable trees.

Action 38.4: Restore one heritage item each year.

Action 38.5: Undertake biannual engineering inspection of critical structures.

Goal 39: *Carry out activities listed in business plans.*

Action 39.1: Provide at least one scholarship per year.

Action 39.2: 90% of collections, comprising approximately 30,000 plants, is available for public viewing.

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Action 39.3: Maintain 2000 herbarium specimens for international research.

Action 39.15: Continual review of the Business Continuity Plan.

Action 39.4: Maintain 25 endangered species within collections.

Action 39.5: 85% of plant records are maintained and verified.

Action 39.6: Provide one autumn (17,000 plants) and one summer (16,000 plants) floral display each year.

Action 39.7: Provide and manage 100 square metres of ornamental planting (0.1% area cover) and 45,068 square metres of shrub and tree groups (21% area cover).

Action 39.8: Provide and manage 1,082 specimen trees (51 per hectare).

Action 39.9: Amenity landscape renewal or upgrading is carried out in designated areas at least once each year.

Action 39.10: Major landscape works are carried out at least once each year.

Action 39.11: Maintain a greater than 8.9 out of 10 average rating (good) by visitors for maintenance and landscaping quality of the Gardens.

Action 39.12: Maintain a greater than 8.7 out of 10 average rating (good) by visitors for the quality of plants in the Gardens.

Action 39.13: 90% of all customer interactions to comply with service standards.

Action 39.14: Implement ongoing staff training and career development certification as required.

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