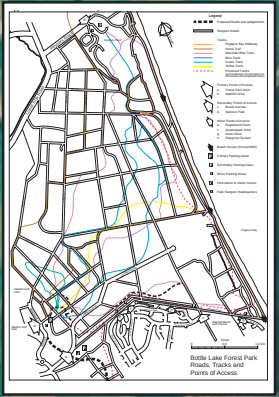

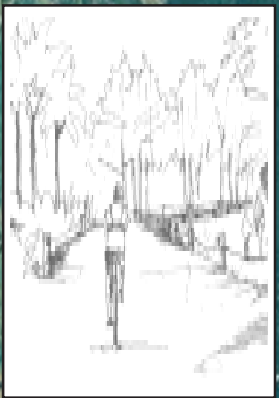

Bottle Lake Forest Park Management Plan

PREFACE

Bottle Lake is geographically well suited to offer recreational and educational opportunities to the people of Christchurch and tourists alike.

At present the actual demand for forest recreation is growing and this can be expected to increase with future publicity, development of facilities and the improvement of road access and tracks into the forest park.

Forests are a source of a variety of values. With changing perceptions of forests come changing conceptions of appropriate management. More recently the notion of multiple use has framed the basic approach to management in this country.

In the past commodity values dominated forest management. However, growing public concerns of a host of other values such as clean air and water, biodiversity, wilderness and recreation has led to a fundamental change in the way that we view forests. Recreation, scenic and related amenity values in forests have now become a central aspect of the popularity of forests.

Underpinning the successful multiple use management philosophy, is the necessity for a strategic plan encompassing and coordinating aspects of use, development and management of the forest resources. This draft management plan is designed to facilitate future management and decision making by providing guidelines (objectives and policies) within which the management and development of the forest parks resources can successfully be managed for this multiple use purpose.

The policies for recreation, education, conservation set out detailed management prescriptions for these activities. Recognising that now and in the near future commercial forestry and refuse disposal are integral components of the park environment, the policies specific to these activities are intended to provide for their harmonious integration with other land uses. Detailed management and operational precriptions for each of these activities are set out in their respective plans.

Although this plan is presented as a final version modifications to the landscape plans presented may take place.

Submissions on the draft plan closed in November 1998 following which a hearing was held in March 1999. Following the results of analysing the 27 submissions this amended version was produced. Eleven submissions specifically mentioned general support for the plan, three entirley and one not in favour of the proposals generally.

Although not part of this submission process, the major alteration to the plan was the removal of the proposed L1 zoning either side of the visitors centre. There were no major alterations to the plan as a result of submissions on the draft Bottle Lake Management Plan.

Eric Banks
August 1999

SUMMARY

The Plan's cornerstone is its multi-use strategy. A zoning system adapted for the Park will become a major mechanism for managing the wide variety of Park users. All present and future park uses fall into two main categories: forestry and recreation.

The plan was prepared after analysing over 50 submissions expressing ideas and opinions regarding the Park's future. One of the management priorities, expressed in many of the submissions, will be to retain much of the wilderness nature of the forests.

Future developments will be staged to complement adjacent subdivision and district park construction. The headquarters area will include a visitors centre and arboretum. The Rothesay Recreation Corridor will function as an amenity access route to other areas of the park and access for local residents with picnic areas and future sports parks incorporated. A coastal ecological corridor will provide opportunities for more passive recreation.

The site currently occupied by the Burwood landfill will be closed in 2002 and converted to a multiple use park to include mountain bike tracks, horse trails, native plantings and picnic areas. The Park will provide a unique vantage point from which to view the City, Port Hills, Southern Alps, Pegasus Bay and the surrounding Forest Park. Tracks and contours will be designed to allow sympathetic integration into the adjacent plantation areas.

The majority of the park will have low key use with tracks and facilties concentrated along a few corridors.

PLAN STRUCTURE

Part 1 introduces the management plan including its purpose and scope, site location and description.

Part II identifies the legislative framework applicable to the management plan and outlines the context and considerations of the surrounding area under which Park objectives an d future planning is to be developed.

Part III provides resource information on the park and its environs, and outlines the historical, cultural, natural and physical resources of the park, including past and present park use. Identification of significant issues, considerations and opportunities provides the basis for formulation of objectives and policies designed to facilitate successful multiple use management of the forest resource.

Part IV sets out current and future land use of the park including forestry, landfill and recreation initiatives.

Part V outlines development initiatives for the park, landscape concepts plans/options for identified key areas of the park and introduces design principles and standards that assist in implementing the desired outcomes identified in the policies.

Part VI outlines the ongoing administrative activities to be carried out by management including land transactions, ranger services and the management plan process.

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PART VI FOREST PARK ADMINISTRATION

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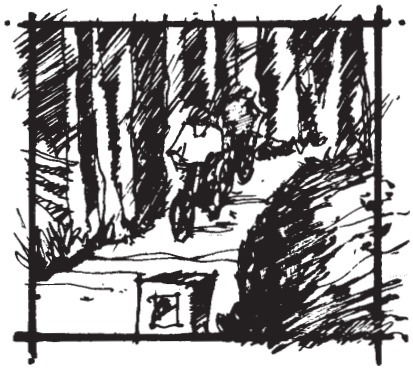


PART I BACKGROUND INFORMATION

1 INTRODUCTION

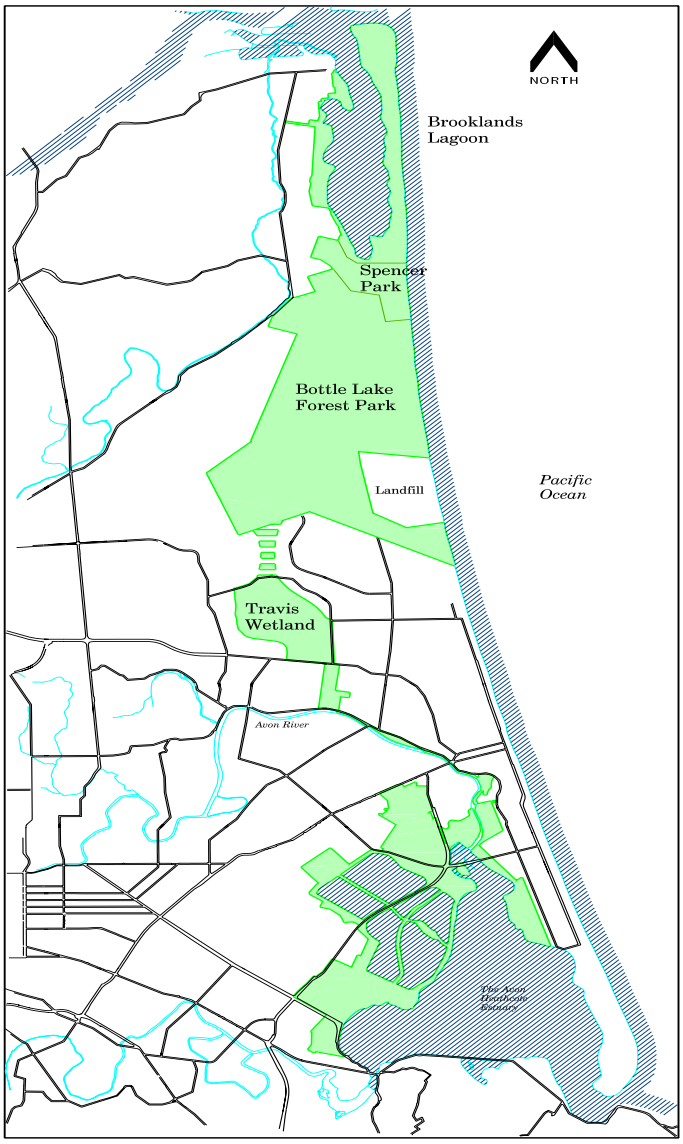
1.1 Location and general description

Bottle Lake Forest Park comprises mostly *Pinus radiata* and covering in total over 800 hectares of coastal sand dunes. The combined area of these forests is four times the size of Hagley Park, and as such forms an important asset to metropolitan Christchurch.

Bottle Lake Forest is situated approx 10 km north east of central Christchurch, adjacent to the coast.

Developed from a farm in the early 1900's, the forest expanded from coastal protection plantings to its present size.

For many years, at least since 1911 to 1970s and even 80s, the predominant use of the forest has been recognised as one of commercial timber production, but the close proximity of these forested areas to central Christchurch and surrounding districts has attracted increasing numbers of visitors so that recreation now constitutes a major use of the forest.



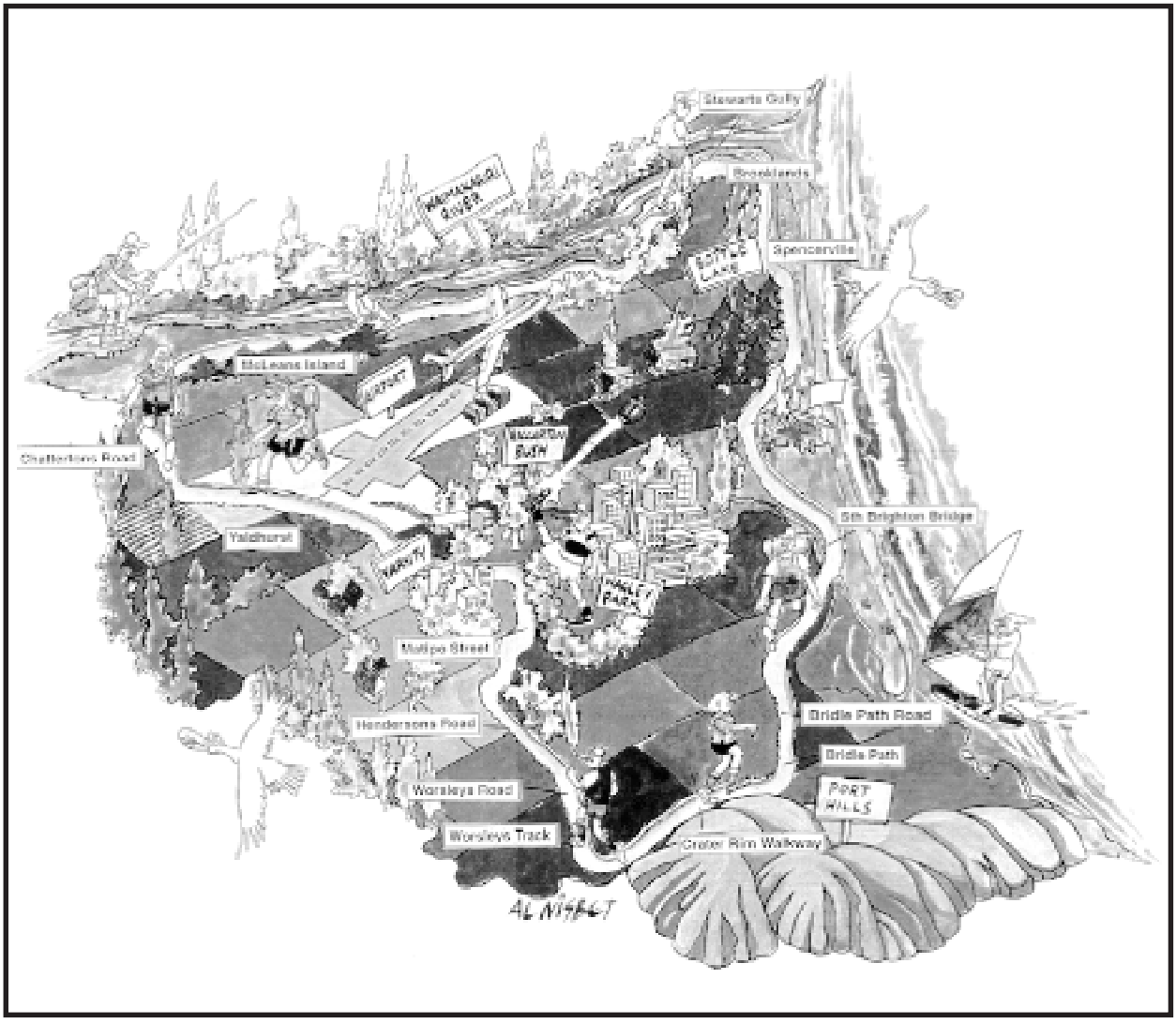
1.2 Open space network

A mosaic of landscape features reflecting the existing underlying constraints and opportunities of the land make up the City's open space areas. In the north-east a chain of separate reserves, including Bottle Lake, Chaneys and Kainga Forests, rural areas, rivers and remaining natural features extend from the Waimakariri River through to the Port Hills.

Originally part of an extensive wetland system, connecting Brooklands Lagoon north of Spencer park and the Avon-Heathcote estuary in the south, Bottle Lake, Chaneys and Kainga Forests now remain an important (open space) link in the scattered remnants including Horseshoe Lake, Travis Wetland, Styx Stream and the Avon River.

Long term initiatives envisage a linked network of these areas of open spaces with emphasis on the differing natural environment and recreational opportunities they present. Combined these features would create a network of open spaces that reflects the diverse and historical character of Christchurch, creating landscape connectedness; biological continuity, urban integration and sustainable management of natural and physical resources in a way that uniquely reflects the diverse and historical character of Christchurch.
The link would provide a total walking network using the coast, the rivers, and the main internal parks within the City. It would take in the Port Hills, the Avon-Heathcote estuary, the lower Avon River, Travis Wetland, coastal dunes, Waimakariri River, backswamps including the Groynes, McLeans Island dry savanah grasslands, and the Wigram retention basin.

A potential exists to link the forest areas of McLeans Island, with the Stewarts Gully and Spencer Park area, through Bottle Lake Forest Park, and the foreshore to the Crater Rim Walkway on the Port Hills.



1.3 Regional significance

Geographically Bottle Lake, provides an ideal setting for a multi-use forest park concept. Few cities have the opportunity to establish such an extensive and accessible area which can so adequately meet the diverse needs of many recreational pursuits. Ever increasing costs of motoring, the varied leisure hours of the population and the likelihood of increased leisure time, make an area such as this a valuable metropolitan resource. The Forest Park offers great potential to establish a diverse blend of recreational and educational opportunities.

The forest proper with its production type plantings of trees and combination of forestry roads together with walking tracks is compatible with the relatively undeveloped character of the adjoining coastal lands and rural environment. The expansive forest areas have a character of remoteness and tranquility. The Park provides a contrast with other more developed open space areas of the City, in terms of visitor experience and enjoyment, with its minimal facilities, foot access and multiuse nature.

Quite apart from its value for recreational pursuits, Bottle Lake, has great value to metropolitan Christchurch in the role of a “breathing space”amidst the general urban development and for its visual value. In these respects it is complimentary to Hagley Park. Moreover, it provides the opportunity for people to participate in activities and experiences not available in a conventional park, thereby increasing the diversity and function of parks in Christchurch.

The area surrounding the plantations is potentially an excellent recreational region, with Chaneys and Kainga forests to the north east; Spencer Park adjacent to Bottle Lake, and the 110 hectare wildlife santuary on the Brooklands lagoon directly to the north. A more recent addition, Travis Wetland to the south, comprises some 112 hectares of the last remaining large scale fresh water wetland within the Christchurch area.

In summary, the park is of high regional significance as a recreational resource enjoyed by increasing numbers of visitors from adjacent suburban Queenspark, and from city wide.

MANAGEMENT GOAL

To provide for the harmonious management of timber production, special purpose activities, the development of diverse recreation and education experiences and the protection of scenic, ecological and scientific values.

PART II MANAGEMENT CONSIDERATIONS

2 *Legal status and legislative consideration*

Objective
- To rationalise land tenure.

2.1 Legal Description and Land Tenure

Ownership and management of the forest has been vested in part by the Minister of lands, under the Reserves Act 1977.

Bottle Lake comprises an area of 845 hectares. 531 hectares comprising Certificate of Title C.T. 128/66, C.T. 128/68, C.T. 128/69, is vested in the Council for plantation purposes, and the remaining 314 hectares is owned by the Council as freehold.

The formerly proposed L1 zone (36.4 ha) has been reinstated as Ru1 under the new CIty Plan (released May 1999). The zone is one of two freehold blocks owned by the CCC within Bottle Lake Forest and is legally described as RS 26529, 30307 and 30308 held in certificate of Title 384/274. The remaining larger area of the forest was gazetted in September 1981 (Gazette Notice 346 494) as a reserve for Local Purpose (Plantation).

Coastal ownership

Most of the land lies within rural section 2637 and 2636. These two lots are land vested in the Christchurch City Council held on Certificates of title 128/66 for plantation purposes.

In addition a series of lots varying between 2 to 5 hectares numbered 35491, 35473, etc., which lie between the city land and the foreshore are owned by the CCC.

A small number of lots in DP918 and DP810 are being negotiated by the CCC from the private land owners.

Landfill Schedule

An area of 96 hectares or thereabouts being lots 1 to 65 inclusive on deposited plan 918, Lots 1 to 32 inclusive on Deposited plan 810, Rural Sections 35471, 35472, 35473, 35476, 35477 and 35491, and Reserve 2636 and part Reserve 2637.

Policy:
- Areas of land currently held in separate Certificates of Title will be amalgamated.

2.2 Reserve Classification

Policy:
So that the future land uses of recreation and plantation forestry are protected, forest park land held in fee-simple shall be classified under section 14 of the Reserves Act as 'Local Purpose'(Plantation).

2.3 City Plan Zoning

Bottle Lake Forest Park, lies within the Rural 1 Zone which covers an extensive area extending north of Rothesay Road to the mouth of the Waimakariri and westward (some 25 km) from the coastal sand dune system (Conservation 1A Zone).

The natural resources in this zone are strongly influenced by its coastal environment and the lower reaches of the Styx River. Soils within this zone are prone to erosion and generally unsuitable for sustaining intensive cultivation. In order to maintain and enhance the soil resources forestry activities are encouraged.

The basis of the rural zoning is to achieve sustainable management of the primary natural and physical resources such as land, soil and water. While the focus is not on the economic use of such land it should be noted that farming and forestry practices diversify the economic base of the City while realising the productive potential of versatile soils within this area. Rural 1 (Ru1) zoning will be retained as the most appropriate for the site.

Source: City Plan - released May 1999.

2.4 Selwyn Plantation Board Limited/Christchurch City Council Licence Agreement

Because of the City Council's desire to rationalise its investment in forestry, the area is now administered by two distinct bodies. The Christchurch City Council leases the land and has sold the growing trees to the Selwyn Plantation Board Limited, a special purpose local authority trading enterprise. Since the company is jointly owned by Selwyn District Council (61%) and the Christchurch City Council (39%) the city retains an interest in the company in accordance with its Strategic (Financial Management) Objectives outlined below:

- To maximise income and minimise expense consistent with a generally conservative approach to risk taking,
- To facilitate the operation of trading activities,
- To maximise trading activity returns to the Council and value of its investment consistent with the purpose in making that investment

The City Council exercises influence on the Board through a statement of Corporate intent.

Since 1990, under a licence agreement with the Christchurch City Council, Selwyn Plantation Board Limited has been managing Bottle Lake Forest Park, Chaneys Forest and Kainga Forest for commercial timber production. This use is in common with the City Council's right to use the land for recreation activities and a range of other uses associated with public works. The council maintains the responsibility for the recreation management of the forest and protecting the forest against recreational misuse.

The licence agreement is for a period of 30 years with right of renewal but is subject to satisfying a range of criteria.

Policy:

- The licence agreement with Selwyn Plantation Board Limited will be updated to reflect land area changes.

3 *PLANNING CONSIDERATIONS*

3.1 Future Urban Growth - Burwood Growth Area

Recent trends in city growth indicate a significant and higher than predicted increase in population. The City's urban growth strategy estimates that Christchurch's population will increase from its 1996 level of 309,030 to around 352,100 by the year 2021. This is creating a high demand for both infill housing within the city boundaries and expansion at the urban edge.

The Christchurch City Council's Urban Growth Strategy promotes consolidation rather than isolated and dispersed patterns of urban growth. Initiatives to accommodate this growth have primarily focused on absorbing most of the growth in the presently defined urban area by developing existing greenfield land already zoned, redeveloping older areas of the City, and increasing housing densities on existing sites in the City.

In addition to this, some expansion at the urban edge is being considered where it can be shown to be suitable for residential development. The Burwood area is 1 of 11 new growth areas that have been identified in the proposed City Plan for future residential development. Located on Christchurch's northern urban boundary adjacent to Bottle Lake Forest Park the Burwood Growth Area contains four distinct areas described below:

- Land surrounding Burwood Hospital and adjoining Parklands. This land is currently owned by Canterbury Health Limited in fee simple and comprises an area of approximately 53 hectares. This land was rezoned L1 from Rural 3 in the transitional plan to provide an extension of the Queenspark subdivision westwards thereby infilling the land between Queenspark and Burwood Road. This excludes approximately 15 ha which is the site of the Burwood Hospital. Ngai Tahu are expected to take ownership of this land as part of the settlement claims.

- An area of Bottle Lake Forest Park adjacent to Waitikiri Drive, and either side of the Forest Park Headquarters. This land is currently owned by the Christchurch City Council in fee simple and comprises an area in total of approximately 30 hectares. There are two parcels of land, the northern block being 9.22 ha and the southern one 20.21 ha. They are separated by a 6.73 ha land parcel which is the entance to Bottle Lake Forest Park. The area is curently planted in 30 year old pine trees and is managed by the Selwyn Plantation board Ltd.

  This area was rezoned L1 to facilitate the acquistion of Travis Wetland. During the early stages of negotiation the developers requested land as part of the Travis Wetland sale so that they would have land to continue their business of residential development once development of Travis ceased. Refer to the City Plan zoning map in section 2.3.

- Land to the south and east of Waitikiri Golf Course, including a 50 metre strip extending along Waitikiri Drive adjacent to the golf course. This area is approximately 20 hectares.

- Land to the west of Burwood Road between Prestons Road and Mairehau Road. Approximate area is 60 ha. In the longer term there may be potential for further extensions to the urban area between Prestons Road and Mairehau Road and further south to Clare Park.

The Waimairi Golf Course is currently leased until the year 2010 and when this expires this land is also likely to become residential development. Development of this land is not anticipated within the current planning horizon which extends to the year 2016.

3.2 Open space and Recreation Needs

The increase in population forecast (3.1) will increase the amount of parks and reserves required. In addition the trend towards increased residential densities will mean that private open spaces will be getting smaller, and the provision of public open space will become increasingly more important. However, the trend towards higher densities will also mean that it will become much more difficult to acquire land for open space.

The Parklands area unit (1986 -1991) had amongst the highest level of new dwellings (250 approx) and increase in population 1991-1996 of 933. Parklands total parks ha/1000 (1991)= 4.94.

The Queenspark/Parklands are has a wide range of parks and open space, the major ones previously described are Travis Wetland and Bottle Lake Forest Park. Parklands has 10 local parks totalling an area of 2.5 ha and 3 district parks (22ha).

This public open space is complemented by the Waitikiri and Windsor Golf Courses. New reserves from future subdivision are likely to make further open space available. Despite the foreceast population increase, sufficient open space will not be a problem for the Parklands area, particularly if the adjacent Bottle Lake Forest Park is taken into account.

3.3 Transport routes/network and Circulation

Woolston/Burwood Expressway

For some years now a designation has been in place to develop the Woolston/Burwood Expressway as an orbital ring road or bypass around Christchurch City to facilitate the movement of traffic south to the Port of Lyttleton and north east of Marshlands and Travis Roads.

The section of the Woolston/Burwood Expressway road designation north of Travis and Mairehau Roads to Rothesay Road was originally developed to service and provide access to residential development in Bottle Lake Forest Park which was an area into which Christchurch was assumed to expand under the Waimairi District Plan. This northern most section of the original designation has been uplifted in the proposed city plan. In its place an indicative road linking Mairehau Road to Burwood/Prestons Road (across Burwood Hospital land) provides a possible link south through to the Expressway, completing the orbital ring road (Planning map 26 A/B). Recent investigations have indicated this link is not required as traffic flows will average only 8600 vpd by 2016 and it is unlikely that such flows would justify specifically building the link as an arterial road and would impact on the amenity of the proposed residential development.

Local Road Network

Increased use of these roads are likely to result from the anticipated increased use of Bottle Lake Forest Park, Waitikiri and Windsor golf courses and proposed residential development in this area will place additional pressure on traffic flow management. Most of the roads within the area such as Waitikiri Drive, Alpine View Lane have been designed as local purpose roads, and accordingly are not expected to carry more than 1500 vehicles per day. Although it is possible to increase this a capacity to 5000 vehicles per day this is likely to be unacceptable to the residents of this area.

Consideration should be given to a new internal system of roads designed to service the proposed residential development within the area and to minimise conflicts at existing intersections.

PART III RESOURCE OVERVIEW

4 *NATURAL RESOURCES*

Objectives

- To protect features of special aesthetic or scenic value and preserve plant associations of scientific interest.
- To protect the coastline from adverse land use effects.
- To ensure soil and water conservation.
- To carry out such measures as are desirable and practicable to control noxious animals and plants.
- To maintain and enhance representative samples of the flora common to the locality and to exotic forest cover.
- To ensure stabilisation of the land and prevention of further encroachment of sand dunes onto high quality horticultural land.
- To preserve and enhance wetland related indigenous flora and fauna for the purpose of natural and physical resource conservation and public appreciation and as a means of promoting wetland ecology.

4.1 *Geology, Topography and Soils*

The area comprises mainly pure sand throughout with occasional swamp remnants. The source of the sand is principally from the eroded shingle screes of the eastern ridges of the Southern Alps, carried seaward by the Waimakariri River.

Sands of these coastal areas are youthful and the soils are little more than a few centimetres of needle litter and acid humus over a root mass in unweathered sand. Though drought prone in in summer, these plantations have a lot of standing water during rainy water.

Patterns of ground vegetation, micro-organisms, mosses and lichens, have not yet been studied.

The topography of the forest is rolling sand dunes sloping gently upwards from the coast. The highest point of the plantation which has been surveyed so far lies 2km from the coast, over which distance there is a fall of only 3.65m. Water lies between 5-45 cm below the surface depending on the season.

The soil in the area is predominantly eroded phase Waikuku loamy sand with a strip of Kairaki sand along the foreshore to the east. Sandy soils usually have a thin coating of colloids providing a degree of binding strength although since the area has been disturbed due to planting, cutting, log recovery and trash burn offs, much of the original profile has been disturbed. This has meant that wind erosion has affected much of the area. Kairaki sand has no topsoil and no colloid coatings so is very prone to wind erosion. The sand is generally held together by plant roots but if this protection is removed then the sand erodes rapidly. Both soils have good internal drainage and are thus prone to seasonal drought.

4.2. *Climate*

The regional climate is characterised by warm summers and fairly mild winters, with approximately 600-650 mm (mean annual) of rainfall per year, having slightly higher than average deposition in the winter months. The mean annual rainfall over a 35 year period within the Burwood area has ranged from as low as 283 mm (1988) to as high as 900 mm (1986).

The winds in this location are of major importance because they strongly affect dune pattern and forest stability. The predominant winds in the area are the north-easterly, westerly and south-westerly. The north-easterly is frequently cold and salt laden and most common in the summer months. Less frequent, but of considerable importance, is the north-westerly which is often strong and dry leading to water stress in the vegetation.

Microclimatic effects of dune areas and forest plantation provide favourable conditions that compensate for the uncomfortable winds which often blow onto the beach.

4.3 *Vegetation*

Pre-European

Prior to European settlement, the Bottle Lake area consisted of sand dunes interspersed by wetland areas. Manuka scrub and ferns were some of the dominant plant species of this early Christchurch landscape.

Pingao, spinifex and other sand binders were common on the sand dunes, with shrubs such as sand coprosma, tauhinu, matagouri, and shrub pohuehue on the more stable backslopes of the foredunes and backdunes, scattered coastal bush species such as akeake and ngaio in sheltered places, and harakeke, toetoe, cabbage tree, and manuka in seasonally flooded backswamps. In some of these interdune sandflats or slacks, where seasonal flooding and summer evaporation led to a build up of salinity a number of saltmarsh turf, reed, rush and shrub species established.

Present Day Vegetation

These forest areas now display a somewhat modified vegetation pattern, with often only remnants or traces of the original vegetation pattern. The present vegetation consists mainly of *Pinus radiata*. Although generally considered lacking in diversity the plantation is host to an array of both exotic and native understory plants. Throughout the plantation is a carpet of indigenous moss and lichens, common ferns such as bracken, pigfern, chain fern and occassional water fern.

Selliera radicans

The coastal strip east of Bower Avenue is largely dominated by marram grass, tree lupin (*Lupinus arboreus*), “purple groundsel” with remnants of some windblown stands of *Pinus radiata*, some macrocarpa and exotic ice plant now used to assist in dune stabilisation.

Predominant weeds ccuring in dense impenetrable patches are *Cytissus scoparius* - broom, *Ulex europaeus* - gorse and *Rubus fructicosus*- blackberry.

Ecologically Significant Sites

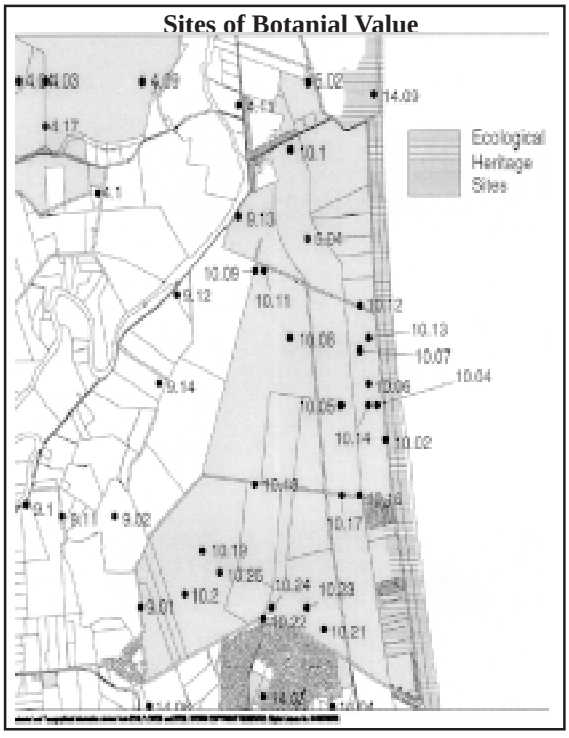
The Christchurch City Council undertook a study of remaining ecological sites within the City boundaries in 1993. This study known as "The Natural Areas Survey" (Meurk, Ward & O'Conner, 1993) identified a number of sites within Bottle Lake and Chaneys Forests with concentrations of native plants, including significant and rare species in some instances. These are identified below. A complete list of native plants is printed in Appendix 4.

Localised sites within sand slack areas which once supported salt marsh turfs display some of the last remaining examples of transitional coastal zone vegetation patterns in Canterbury. Significant indigenous species identified within these sites were Schoenus concinnus, Isolepsis basilaris (known now from Canterbury only in shoreline turfs of Lake Ellesmere), Selliera radicans, and Schoenoplectus pungens (three square). In more swampy places taller growing species such as Juncus pallidus, Bolboschoenus caldwellii, Juncus maritimis, and Leptocarpus similis have been identified shaded out by pine trees. There are very scarce marsh ribbonwood. On the back slopes of foredunes are scattered tauhini shrubs (Cassinia leptophylla), and on dry sandy flats adjacent to the slacks some of the sand-binding Carex pumila was noted. Harakeke/ NZ flax is also found although now rarely in the interdune hollows.

Because the survey was conducted in autumn, it is likely that other perhaps rarer, spring ephemeral species such as may also exist at these sites.

Two former wetland areas have been identified in a 1947 topograohical map. They are bounded (1) 18th Avenue and 20th Avenue and (2) 15th, 17th, and Lima Avenues. Their present condition is unknown.

The turf site occupies a sand flat and contains a mixed (poplar)/rush-sedge-herb turf, with approximately 15% native vegetation cover. The area ranked very highly (5 out of a ranking system of 1-5) in the unusualness/rarity criterion. This equates to a more than 2 locally uncommon or threatened species being present. The other two areas are within pine plantation itself and relate to the understory species of ferns and herbs.



Site	Evaluation	Ecological Unit
5.02	C	pine/fern forest
5.04	C	(rush)/sedge/turf dune slack
9.01	D	exotic deciduous forest
9.13	C	(pine)/bracken-sedgeland
10.02	B	rush-reed/sedge-herb saline turf
10.04	B	rush-reed/sedge-herb saline turf
10.05	C	pine/willow-cabbagetree/reed forest
10.06	C	pine/reed-rush woodland
10.07	C	willow/moss-lichen forest
10.08	C	pine/NZtree/bracken planted forest
10.09	C	pine/poroporo forest
10.1	C	pine/rush woodland
10.11	C	pine/poroporo/bracken-NZgroundsel forest
10.12	C	pine/reed woodland
10.13	C	pine/reed woodland
10.14	C	pine/rush-reed-toetoe/herb woodland
10.16	C	(pine/willow)/rush pond margin
10.17	D	broom-treelupin-blackberry shrubland
10.18	B	willow/NZtree/sedge-rush planted pond margin
10.19	C	pine/bracken-blackberry forest edge
10.2	C	pine/(poroporo)/bracken/piripiri forest edge
10.21	C	pine/blackberry/piripiri forest
10.23	C	pine/(cabbage tree)/bracken-rush forest
10.24	C	pine-willow/rush-NZgroundsel forest
10.25	C	pine/orchid forest

Policies:

1. The taking of limited quantities of native plant material from the park by members of the public for cultural, educational or scientific purposes may be approved on application to the Parks Manager who will consult with the Selwyn Plantation Board Limited on the matter.

2. Any plant material removed from the park will be the minimum necessary for the purposes required and care will be taken to ensure that its removal does not adversely affect the surrounding environment.

3. Park staff may remove vegetation where this is necessary for operational reasons, e.g. maintaining tracks, for use in interpretation and education programmes.

4. The recommendations relating to vegetation management included in Appendix 5 shall be consulted prior to carrying out development in any area containing identified sites of ecological value (refer to Parks Unit records). This list will be updated as new sites are discovered and if existing sites are modified.

5. The regeneration of native species shall be encouraged in areas where soil conservation and dune stabilisation practices are warranted. Where necessary restorative planting may be carried out.

6. The selective planting of exotics, e.g. eucalypts, oaks etc for shade or aesthetic values, poplar and willows for soil conservation, or pine trees for firewood will be permitted in certain areas.

7. Protection and enhancement of significant indigenous vegetation shall be undertaken and caried out in line with "Old Dune Ecosystem" as per the document *Indigenous Ecosystems of Otautahi Christchurch. Agenda 21 1996.*

8. That former wetland areas bounded by (1) 18th Avenue and 20th Avenue, and (2) 15th, 17th and Lima Avenues be investigated as to the viability and appropriateness of restoration in conjunction with the Selwyn Plantation Board Limited. "Viability" to be defined in terms of restoration success and value to wildlife.

Explanation

Areas or features require careful planning in order to prevent unnatural modification or excessive disturbance either by man or animals. Control of erosion, dune stabilisation is also of prime concern, especially where recreational activities are dominant.

Noxious weeds are not a major problem at present and can be controlled under a regular maintenance programme. The spread of rabbits, hares, oppossums, goats and invasion by other weed species are continuing threats.

Indigenous trees and plants shall be retained, and effort made to encourage the regeneration of native species within various areas of the park for purposes of soil and water conservation, landscape appreciation and recreational enjoyment.
Exotic trees and timber plantations are established where these are required for soil conservation, firewood or timber supply, shade or aesthetic purposes.

Juncus pallidus

4.4 *Wildlife*

Avifauna

An avifauna survey conducted by Eder (1977) recorded 27 bird species at Bottle Lake Forest Park. Listed according to feeding habit (table below) provides some indication of requirements for maintaining and increasing bird populations and species diversity within the forested areas.

Bird distribution is dependent upon the interaction of food, habitat, and shelter as well as physiological characteristics specific to certain species such as territorial activities which may modify this.

Different areas within the forest present different opportunities for birds to exploit. For example mature (pure) forest is likely to support more insectivorous or carnivorous species while edge forest areas provide a variety of habitats and as a consequence a range of food supplies and hence many more species.

The bird species present in an area depend on the type and diversity of habitats. During forest stand establishment of weeds and a prevalent seed source are a welcome food source, while closing of the canopy reduces the light source and as a result the weeds and herbs that previously provided a food source for many bird species.

In time thinning and maturing of the forest allows greater light to reach the forest floor where partial establishment of herb and understory species once again provide the necessary variation in both habitat and food source to support a variety of bird species.

Water as a breeding ground for insects is an important link in the chain. Of the species at Bottle Lake only 5 excluding aquatic ones, do not use tree or shrubs as nesting sites.

Animals

The following pests are found at Bottle Lake: stoat, rabbit, feral cat, possum, ferret, rat, hare, stray dogs. There currently exists a trapping programme which is carried out to reduce numbers of cats, ferrets and possums.

Policies:

1. Maintain control of thees identified pests.
2. Survey the extent to ascertain the presence of significant insects, amphibians and lizards.

4.5 Landscape protection and enhancement

Policy

- The natural landscape character of the park shall be maintained as far as possible, particularly in relation to the sand dunes, swamps and ecological areas.

Bottle Lake Avifauna by feeding habit

Feeding habit	Bird specie	Feeding habit	Bird specie
Insectiforous	greywarbler	*Omnivorous*	*insectivorous + vegetative+ seeds*
	shining cuckoo		
	South Island fantail		greenfinch
			goldfinch
			redpoll
Carnivorous	New Zealand harrier		chaffinch
			house sparrow
Omnivorous			yellow hammer
			Californian quail
	insectivorous + vegetative		feral pigeon
	songthrush		
	blackbird		*Insectivorous + carnivorous*
	starling		morepork
	silvereye		little owl
			kingfisher
	insectivorous + seeds	*Aquatic*	grey duck
	dunnock (hedgesparrow)		mallard
	skylark		white faced heron
	Australian magpie		pukeko (swamp hen)

5 *CULTURAL RESOURCE*

Objectives

Protect, enhance and provide interpretation for archaeological sites and cultural history.

5.1 Pre-European History

For the Tangata Whenua the area was important for mahinga kai with food being available in this vicinity all year round. Waitikiri lagoon was an important fresh water fishery that has since been drained. Water way access to the sea was also possible from this area. A major Kaianga Nohonga serviced the Waitikiri Lagoon and the Travis wetlands. It was called Oruapaeroa and was sited where Queen Elizabeth Park now stands. The sand dunes adjacent to Travis Wetland and Waitikiri Lagoon provided temporary accommodation for the family groupings that used that area. Burial sites are also located within this vicinity.

An archaeological midden site is located near Spencer Park. The approximate location is shown on the zoning map in section 8.3.

Given past occupation of the dune areas by Maori in the coastal areas there is a high likelihood that human bones will be found as the dunes have been used as burial sites.

Policies:

- Conduct survey of area to locate sites of pre-European occupation.
- In cases of the discovery of kolwi tangata (burial remains) the kaitiaki runanga shall be notofied so that reburial, reinternment or removal for safe keeping can be accuated.
- Any major works in this area will be done in consultation with the kaitiaki runanga with regard to possible burial sites.

5.2 European History

Land Acquisition

In the period of early Canterbury settlement the area currently occupied by Bottle Lake, Chaneys and Kainga forests was part of the ‘Sandhills’sheep run which included an extensive area of land from the Waimakariri River to New Brighton, and was let for grazing in 1853.

The original intention was to use the area for offal and nightsoil disposal, as it was considered remote enough from existing and potential population centres. However, the drainage farm set up at Bromley, the precursor of the modern sewage works, gave reprieve to this use and enabled the Council to lease the land for farming, continuing what was to prove a disastrous practice.

Extensive over-grazing, assisted by introduced rabbits and hares led to denudation of most of the vegetative cover, including the native sand binder pingao. Driven by high winds the sand was free to move, hindered only by clumps of scrub where it accumulated forming mounds that eventually grew to sizeable dunes, smothering the remaining natural vegetation and young plantations already established. Sand drifted inland, in places up to 2.4 km and dunes attaining a height of 30 feet burying pioneer plantations was not an uncommon sight.

Faced with the potential loss of the valuable and productive peaty market garden soil of Marshlands the Council stopped grazing of the land in 1912 and actively pursued methods to prevent the accretion of sand along the shore line from moving inland and stabilise the masses of sand that had drifted inland from the shore.

Plantation establishment

Although small plantations of 20-30 acres had been established as early as 1883, it was not until 1912 that a plan of afforestation had been formulated as a means to stabilise the movement of sand inland.

Initial plantings were experimental comprising various species of pinus oregons, spruce, redwoods, oaks and eucalypts. Most struggled in the harsh conditions with the spruce and oregon failing completely. Although all of the pines suceeded, it was soon realised that *Pinus radiata* was the most suitable tree. Its quick growing qualities and tolerance of the harsh coastal conditions led to it being extensively planted from 1915 onwards.

Foredune establishment

The depression of the early 1930's brought a huge pool of unemployed, government funded relief labour. In 1932, Len Hal, Bottle Lakes first forester used this finance to address the source of the problems and the 'No. 13 unemployment scheme' began work at Bottle Lake Forest. To stabilise the coastal sand and as a means of protection, a continuous 'foredune'4.5 km in length was constructed 40m above the 'high water mark', parallel with the coast line.

Timber and Firewood Production

Soil establishment and extensive planting of *Pinus radiata* were the two most important activities of the depression period. But they were not the only works undertaken. Great advances were made during the middle and late thirties with the forestry practices of underscrubbing, high pruning and thinning. During this period upwards of 200 men were employed. The removal of undergrowth and lower branches of the trees reduced the chances of large scale destruction by fire. Firebreaks were constructed and roads created along them with material for the latter being brought from the Burwood rubbish dump, which was being transformed into the modern Burwood Park.

In the 1940's and 50's firewood was taken from the forest to fuel the furnace for the tepid baths in the inner city. The furnace burnt the inner city's combustible refuse to heat the swimming baths. The ash was laid on the forest roads including waste such as, assorted metal, nightsoil cans and so on.

Land Development

In the early 1970's land developers proposed the use of Bottle lake Forest for residential development. However in 1977 the area was renamed Bottle Lake Forest Park reflecting the Council's commitment to a new multiple use approach to the management of the forest.

PART IV FOREST PARK LAND USE

6 FORESTRY

Objectives

- To promote production forestry on a sustained yield basis.
- To promote forestry (silvicultural) practices that are compatible with conservation of the soil and the recreational values of the forest area.

6.1 Management strategy

The production of timber from Bottle Lake is integrated with the production of timber from other forests in Canterbury either owned or managed by Selwyn Plantation Board Limited. This board has owned and managed forests in Canterbury, extending from the coastal sand plains to the foothills since 1911.

The major species grown at Bottle Lake, Chaneys and Kainga is *Pinus radiata* (99.5% of the area). The remaining area is stocked with *Cupressus macrocarpa*, corsican pine, and P*seudotsuga menziesii* (douglas fir), a consequence of early intial planting trials in the area. Radiata pine will remain the productive species for the forest as it appears most suited to the site.

Bottle Lake Forest Park area is divided up into 24 compartments with the size ranging from 6-32 hectares. Two compartments are devoid of trees and have been used for refuse tips for disposal of Christchurch metropolitan waste (refer section 7).

Each compartment contains trees of various age classes, which combined with a cyclical pattern of clearfelling mature stands and replanting within one year ensures continuity of supply in perpetuity.

The emphasis in the management technique is on the economic production of high quality saw logs. To achieve this the total volume of wood per hectare must be maximised, without compromising quality, in the shortest possible time. This means maximising the total volume per hectare, without compromising quality, in the shortest possible time.

Previous management techniques within the forest park areas have generally been cited following a 35 year rotation. However, unlike many other products wood has a wide window of opportunity and consequently cutting can be accelerated during times of high prices and slowed during times of lower prices. Depending upon market supplies and prices at the time this may be reflected in the removal or retention of trees of various ages classes to satisfy the various product commodities in demand. More recently the trend is towards harvesting of younger age classes as sawlogs primarily for the local market. To satisfy demand larger quantities are required because of the concomitantly lower volumes in younger trees.

In a similar manner the demand for chiplog for the export and local market medium density fibreboard product has also led to the extraction of considerable quantities of thinnings and young trees aged from 7-18 years over recent years.

6.2 Timber production

A total of approximately 60 ha has been earmarked for possible timber extraction in 1998/99.

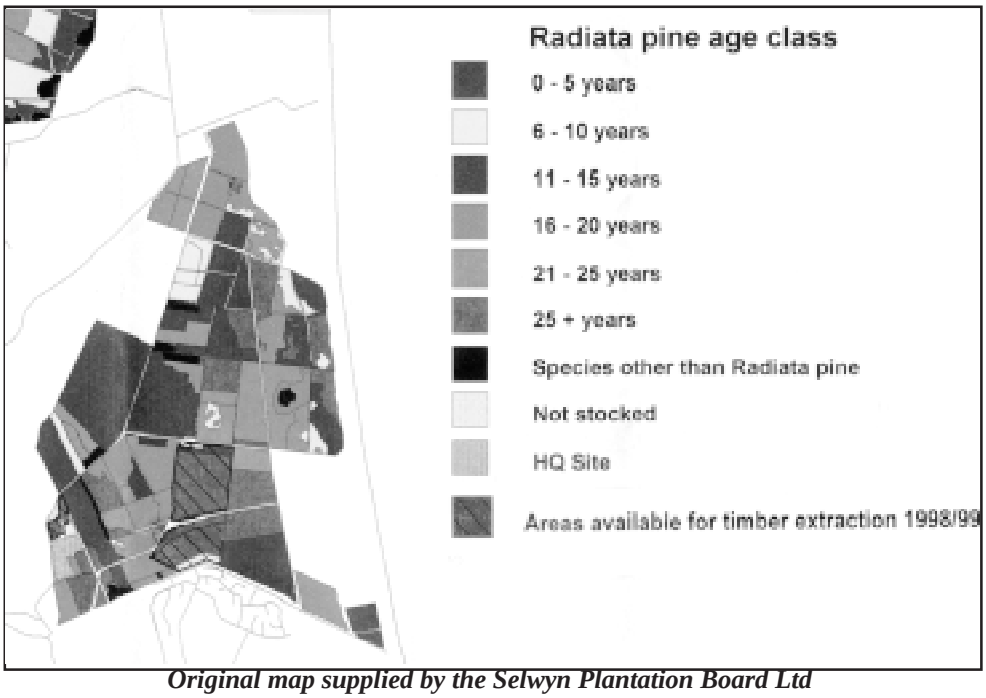
The map below indicates:

(a) areas earmarked for timber removal in the coming year,
(b) age of the present forest blocks.

Policies:

1. Logging and forestry practices must be conducted to keep soil disturbance to a minimum.

2. Any land clearing operation will ensure that riparian buffer zones of existing vegetation are retained to safeguard soil movement and that amenity areas and areas identified as significant indigenous vegetation are protected.



Original map supplied by the Selwyn Plantation Board Ltd

6.3 Environmental influences

As a result of gales in the 1950s and 1960s and 1975 techniques like ripping to promote root growth, planting rows into a northwest direction and changing the forest structure have been used to increase the stability of stands.

Stands on the northwestern boundary of the forest are open to the full force of any gale force winds and are taller than ones upwind. A continuous canopy without sudden changes in height or breaks due to wide roads or holes in the stand will ensure maximum overall stability.

Mutaleb (1988) reported that the mean annual rainfall in Bottle Lake Forest Park and Chaneys forests is below the requirement for optimal growth. These areas may be regarded as dry areas for radiata pine in which drought could be aggravated by the sandy nature of the soil. However, it is possible that the trees may tap moisture deeper in the soil profile as the rooting depth is not restricted, but feeding roots are on the surface.

Impact of Recreation on forests

Although the operational forestry practices are generally common to any production forest, the management of the forest for multiple use objectives such as production forestry and a range of recreational activities is somewhat less common, particularly in metropolitan areas of New Zealand. A consequence of this approach to forest management, not experienced in conventional production forestry, is the potential for conflict and associated implications from increased recreational use of the forest on general operational and management practices. Several such issues have been identified:

- Recreational activities have the potential to disrupt forestry operations.
- Forestry management requires a degree of flexibility especially where forestry operations interact with recreation.
- High demand for recreational use of the forests means that public demand may exceed the company's ability to set aside safe areas for recreational use.

***Policy**:*

- Public entry into areas where clear-felling is being conducted will not be be permitted. Appropriate signs shall be erected to ensure the public is aware of possible dangers in these areas.

Fire management/control

A diverse plant community of coastal species enhances the ability of dunes to resist fire because most common dune species have low natural combustability and high capacity to regenerate following burning.

Foredune vegetation is afforded an obvious and natural firebreak seaward, while on the landward side swamps or roads prevent the spread of most fires. Existing firebreaks, some 20 metres in width of disked sand prevent weed growth, to the leaward side of the foredunes. Construction of tracks and firebreaks need to be carefully weighed against the disadvantages of increased accessibility and the attendant risks such as weed invasion and accidental burning.

In day recreational areas provision of properly constructed gas barbecue facilities is recommended. This will minimise the fire risk and prevent damage by people seeking firewood.

Bottle Lake Forest Park falls within a fire district where vehicle access is prohibited through several summer months. The plantations are served by artesian lakes and forest roads for fire control purposes.

Policy:

1. The need for a network of minor access tracks for servicing isolated fires that may occur in the foredune areas shall be investigated.

2. Dependant upon negotiation / agreement with the Selwyn Plantation Board Limited, the initial stages of a fire break be formed as soon as possible between the Forest Park and the Heyders Road subdivision. This shall be carried out in such a manner so as to minimise the risk of north-west wind throw.

3. Consideration needs to be given to the provision for further wells to be sunk for fire fighting purposes.

7 REFUSE DISPOSAL

7.1 Burwood Landfill

Background

The use of the three 15 to 25 hectare blocks for landfill purposes is seen as an interim use of the land only and it is the Council's policy that the land must revert to recreation and afforestation as soon as landfill operations in each sub-cell is completed. The scheme has been designed to assist in the improvement and enhancement of the area in order to yield a parkland environment as an extension of the Bottle Lake Forest Park and suitable for passive or active recreation use in the future.

The refuse disposal work including the landfill is to be managed in a way that the area will be improved for this ultimate purpose providing a transition between the more intensive production forestry in the west and the foredunes and beaches in the east.

Site Description

Investigation into a joint refuse disposal scheme to manage solid waste disposal on a metropolitan basis commenced in 1970. Establishment of a single landfill and several transfer stations was considered. The Burwood Landfill site was selected after extensive investigations involving 14 sites as the most suitable for this purpose and satifying a range of logistical, environmental, economic, and amenity criteria.

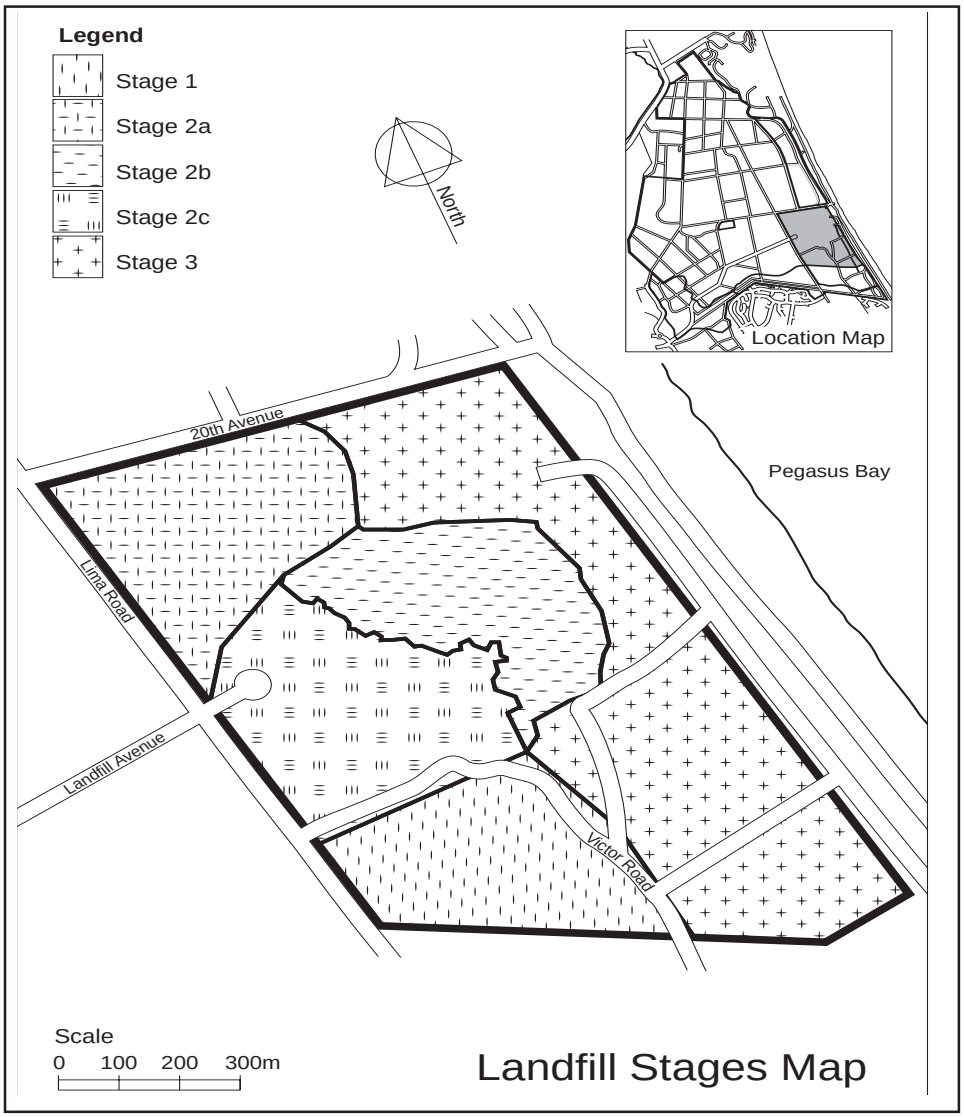
Landfill operations commenced at the site in 1984 and has been the principle refuse disposal facility for Christchurch waste.

The landfill site covers an area of 96 hectares, divided into three main stages. Stage 1 comprises 11.4 hectares and contains approximately 1,100,000 m^3 of refuse. Filling began in 1984 and was completed in 1988. Stage 2 commenced in 1987, covers an area of 43 hectares and is divided into two sections. Stage 2a was filled between 1987 and 1991 with a total volume of 1,070,000m^3 of refuse. The remaining stage 2b is estimated to have a capacity of over 1,400,000 m^3 of refuse and is expected to have a further 5-6 years remaining.

Stage 3 covers an area of 42 hectares, with an estimated capacity of 4,200,000m^3 and a lifetime of 12-15 years. Recent results from consultants monitoring the site have revealed that while Stages 1 and 2 are performing satisfactorily proceeding with stage 3 of the landfill in its planned location was likely to lead to levels of contaminant (leachate) in the groundwater that were above acceptable environmental standards. The Burwood landfill was designed and constructed before liner systems were required in New Zealand landfills.

Operations of the landfill are subject to a resource consent under section 15 of the Resource Management Act for ongoing landfill operations for the life of Stage 2b only. This is anticipated to be until 2002.

The area formerly designated as Stage 3 landfill will now be incorporated into the Landfill park concept.



Operation and management

Management of the landfill site is seen as a multi objective proposal aiming at stabilising the dune system, providing recreational benefits as well as disposing of refuse. However, the desire to optimise the refuse disposal potential of the area must not be allowed to interfere with, or in the long term, delay the other potential benefits for Christchurch.

Leachate and Landfill gas

Landfill gas produced from the decomposing waste comprises carbon dioxide and methane. At Burwood landfill, low rainfall, and consequently low moisture levels within the refuse tends to limit the rate of gas production. However as each tonne of refuse produces 200m3/tonne of landfill gas, a reduced rate of production would extend the time over which that volume is generated, which may expected to realistically be in the order of 30 or more years.

Gas composition at the site is 60% methane and 40% carbon dioxide.

Early attempts at preventing gas escape were unsuccessful because of the permeable nature of the soil used for cover material, allowing gas to escape to the atmosphere. The lack of depth of cover material to allow growth prevented successful establishment of vegetation. The effect of the gases on the vegetation reduces the availability of oxygen concentrations in the root zone required.

On site these effects have constrained the type of vegetation used in rehabilitating the completed fill areas. To overcome these difficulties an appropriate cap together with sufficient depth of growing medium is being constructed to provide a suitable growing environment.

Rehabilitation

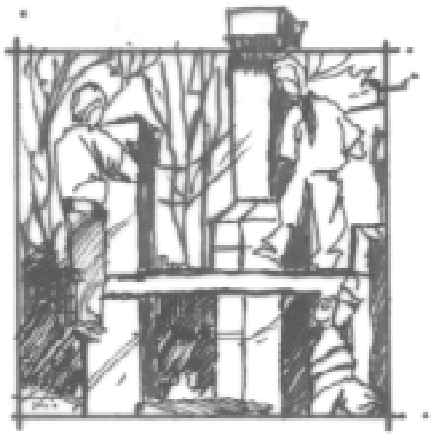
When allowed to settle and resulting subsidence hollows are filled with topsoil, these former refuse landfills can carry permanent grass covers of ryegrass, chewings fescue and browntop. Tree growth tends to be less vigorous, and somewhat stunted, compared with conventional topsoil and subsoil growing medium.

The final landform which has been adopted is an optimum balance between the objective of maximising the overall volume available for refuse disposal and the need to complement surrounding topography in an acceptable manner.

Reinstatement and Recreational use

On completion of landfilling each stage, including rehabilitation of vegetative cover, the area is handed back to the Parks Unit for assimilation into Bottle Lake Forest Park. Since the metro refuse sites are unsuitable for production planting due to the carbon dioxide and methane trapped beneath the surface it is intended that recreation, in conjunction with protection planting will be the predominant end use of the area.

The use of the area on the seaward side of Bower Avenue for protection and parkland type tree planting is essential as a buffer to the salt spray and easterly winds off the sea. Its future use for recreation including protection, parkland and some forestry provides a management pattern of transition between the fully productive Bottle Lake Forest Park as a whole and the beach areas. This transition also provides some recreation relief to the main plantation, in that orienteering, horse riding and other informal recreation activities can be encouraged to locate along this margin.



Budget and timing of the landfill enhancements are listed in section 13.5. Refer to 10.5 for more detail of the future recreation uses of the site.

Future landfill site

The selection of a future site for refuse disposal has been the subject of extensive research and public consultation. Submissions have been addressed on the issue of supplying a new landfill area to service the Canterbury region with a method and site for future refuse disposal. The submission primarly focuses on issues and adequate criteria for selection of an appropriate site.

These issues are currently being considered by the Canterbury Waste Joint Standing Committee. Results of their decisions should be known early 1999.

8. RECREATION

Objectives:

- To provide a range of forest based recreational opportunities compatible with forest management and safety.

- To develop recreational facilities in consultation with potential users.

- To provide facilities for the needs of public recreation and to design and locate these so as to harmonise with the existing character and landscape values.

- To consider recreation in a regional context while taking full cognisance of other facilities which have already been provided by other bodies or which are planned.

8.1 Background

Access to Bottle Lake Forest Park for educational and recreational activities was originally granted on a permit basis and it was not until the late 1970s that the area was opened to the public for recreational pursuits. In part, recognition of a number of factors, outlined in a recreation plan prepared in 1975, was instrumental in advocating opening of the forest for use by the public:

(a) The significance of such a forest area close to a large city population,

(b) The range of recreational pursuits which could be accommodated within the forest area while at the same time maintaining production forestry,

(c) The advantages of permitting public access as an overall aid to surveillance,

Since this time Bottle Lake Forest Park has received very large numbers of visitors from the greater Christchurch area, with an estimated annual use of 250,000. To this day the recreational potential of these forest areas remains relatively unrecognised,

Utilising existing forest tracks and by providing additional walking tracks together with a main entrance car parking area, the forest has been open to the public since 1976.

8.2 Visitor Use Survey

A user survey conducted at the main Waitikiri Drive entrance over a four week period in February 1993 showed that park users were predominantly male (63%) and aged between 31 and 50 years old (64%).

Only 8% of visitors recorded during this time were under 25 years of age, however casual observation revealed a higher proportion of younger visitors were female horse riders.

The majority of visitors to the park were either alone (46%) or in pairs (37%) and stayed anywhere between 1-2 hours (55%), mostly for exercise, with the principle activities being either running, walking and exercising the dog.

Training for sports including harriers, triathlons, rugby league, rugby and netball also constituted a relatively high proportion of activities conducted by the respondents (31%), while bicycle riding and horse riding constituted a relatively small proportion of the activities conducted, comprising 10.5% and 2.3% respectively.

Other significant factors cited by respondents in deciding/choosing to visit the forest park were because of the clean air, variety of terrain, reduced risk of injury, injury recovery, space, quietness, tranquility and solitude although these remained secondary to the main purpose, with only 2% visiting for the sole purpose of enjoying the forest environment.

65% of respondents visited the park between 1 and 4 times per week and whilst most respondents (79%) indicated they used the park all year round, more recent observation suggest that park use is mostly concentrated during the summer months.

Overseas research has shown that the pattern or trend of visitor use can be correlated at least in part to the level of management intensity within an open space. Evidence suggests that open space that is managed is more intensively used than that which is not, and is the most important variable affecting visitor use (Fitzpatrick, 1987). Results showed that if footpath quality is improved more visitors are attracted.

This research also associates disparities in level of use between male and females to the level of management of open space. Although, all types of urban open spaces were used more often by men than women, the discrepancy was twice as large for unmanaged sites. Evidence suggests that “the more intensively used a space is, the greater will be the proportion of female users” Moreover this extends to girls and boys, not just men and woman.

This discrepancy has also been identified at Bottle Lake, illustrated by the a ratio of 2:1 male users to female users of the forest park. In particular comments made by women indicating that they they felt unsafe running or walking alone in the forest suggests this is likely to be a significant factor in this disparity.

Further evidence also suggests that “low key” management of native vegetation, has the same overall effect on visitor use as intensive vegetation management when supplemented by the presence of rangers or site managers. This highlights the importance of safety and security to users and the attraction of a site which looks cared for.

8.3 Recreational zones and experiences

Multiple land use philosophy

The original purpose for establishing the forest was for protection of productive land against invading dunes. For many years now protection has been the primary function of this area and indeed the proposed city plan zone provision "Rural 1" emphasises the importance of soil and water protection in this harsh coastal environment. Alongside the realisation of the productive capacity of this area as a timber commodity, the forests are increasingly related to public reserve values which are reflected in the number of recreational users and future development plans for the area.

Multiple use of this extensive coastal forest resource is now the focus of any long term management scenario for this area. Forests are able to sustain a wide range of uses and potentially be used successfully. *Multiple use* can be described as the harmonious and coordinated management of the various resources and land uses.

In practice this often appears to correlate to what may be referred to as multiple use by adjacency, with timber harvested in one place, recreation provided in another, and so on. In practice this relates to each use having pre-eminence in certain key areas.

Land uses also have the ability to modify the landscape character of the area to the detriment of many other values such as amenity, ecological and other environmental values. To ensure these values are retained and further enhanced a system of zoning is proposed that recognises the intrinsic values of the area, alongside the production of timber.

General zoning approach

The approach adopted for Bottle Lake Forest Park is the establishment of a zoning system that recognises and identifies the forest park land according to the predominant management practices to be implemented on it.

Zoning is a breakdown of forest park land mainly for describing intended use. It may also form a preliminary approach to possible dedication, in terms of the Reserves Act, 1977.

A zoning exercise has been completed on a broad scale to provide the basis for land use decisions. This has entailed a consideration in the first instance of all those areas in which some reservation from production activity is desirable, either for reasons of soil and water conservation, preservation of notable scenic features or botanical associations, or where the recreational and amenity potential of the forest present has an over-riding value over production.

These zones may also impose some degree of restriction on recreational use, either by an implied danger (production zones) or by a threat of overuse to other more important values, normally scientific or ecological. However, classification for recreational use, overlying the above zones also imposes its own limitations according to how far down the course of development it is desirable to take a particular area for example, recreational development, amenity, remote experience and natural environment. There has to be a marrying of competing values as far as these are known, if a satisfying definition of future land use is to be made.

Information Requirements/Flexibilty

New information or changes in public values may subsequently necessitate alterations to zone proposals. Such zoning must be flexible and amenable to change following shifts in the public interest, receipt of new information, and new developments in forest management. Zones are based on information collected, submissions and intrinsic values.

Policy:

- Zoning shall remain flexible and amenable to change following shifts in public interest, receipt of new information, and new developments in forest (and park) management.

Description of the zones -

Three recognised primary zones have been identified as Recreation, Protection and Production. Within each primary zoneation there are various titles given. (See adjacent chart)

- **Protection Zones:** Protection values are normally given high priority in management prescriptions and protection of land for water and soil values is exercised over the entire area. Some aspects of protection, relating to flora and fauna, will obviously conflict with production or recreation values.

- **Production zones:** These zones have been defined to accommodate merchantable timber production and include all areas within the zone that are currently being logged or open areas awaiting replanting. Within this zone there may be some smaller/minor areas of protection which have not yet been identified or are too small to show on the map. Protection of these sites may necessitate manipulation of the forest (or forestry operations) to facilitate and maintain viable understory populations of indigenous species.

- **Recreation zones:** Recreational development and associated specific uses such as sports-fields and arboretums, will generally be peripheral and the bulk of the park be classified remote experience.

To provide an indication of the type of public usage envisaged for the forest the following sub zones will be recognised and superimposed where appropriate:

1. **Remote experience**: where no development is contemplated
2. **Natural environment:** low intensity tracking: the major part of the park
3. **Amenity:** sites developed for picnicking, parking or casual camping: small peripheral high use areas at road ends.
4. **Recreational development:** covers development of facilities for intensive public use where encouraged or allowed. Such areas will generally be small and close to the edge of the forest, where they are readily accessible. Predominance of these areas identified has been established as main access high use and moderate use areas. Public use will also determine the requirements of such areas.

In the interim the object will be to direct and control public use by establishing a few well developed amenity sites throughout the periphery of the park regarded as focal centres for intensive use.

Development Units

A series of development units have been identified from the zoning breakdown for specific development programmes. These are:

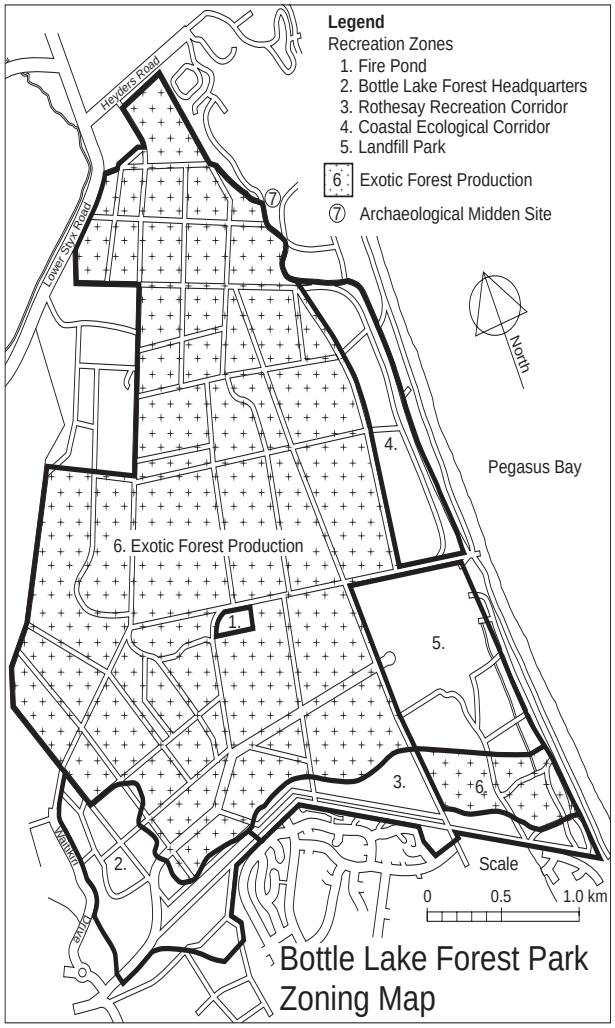
1. Fire Pond picnic area
2. Park Headquarters development
3. Rothesay Road Recreation Corridor
4. Coastal Ecological and Amenity Corridor
5. Landfill Park

Development proposal landscape plans are outlined in section 10. The adjacent map illustrates the specific development zones, (Bottle Lake Forest Park Zoning Map).

Zone class	Category	Zone	Development Unit and map reference
Recreation	**Intensive**	**Recreational development / specific use**	**2, part of 3**
	Extensive	**Amenity** **Natural environment** **Remote experience**	**3** **4** **1 & 5**
Production	**Exotic production**	**Exotic management**	**6**
Protection	**Soil / water**	**Landfill rehabilitation**	**5**
	Flora/fauna	**Ecological habitat rehabilitation**	**4**
	Cultural	**Archaeological / historical sites**	**7 (midden site)**

(Adapted from Hanmer Forest mangement plan)

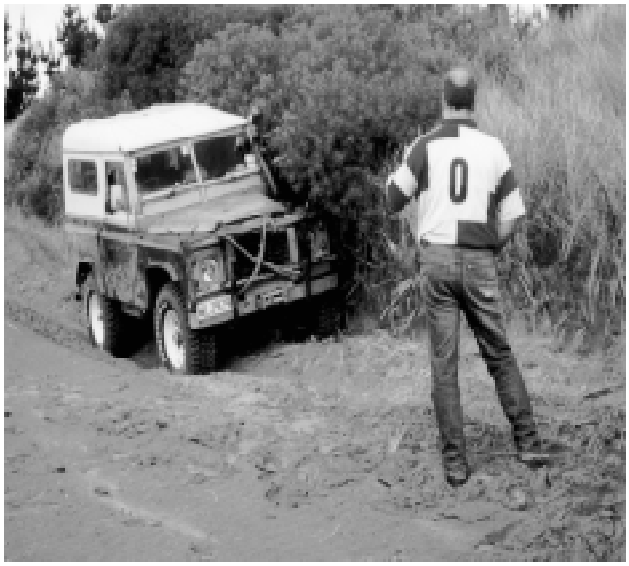
	Development Unit / Activity	Primary Use	Secondary Use	Compatable uses
10.1	**Firepond**	**Recreation** **Extensive** **Remote**	**Protection** **Water**	**???**
10.2	**Park HQ**	**Recreation** **Intensive**		
10.3	**Rothesay Road Recreation Corridor**	**Recreation** **Extensive** **Amenity**		
10.3	**Bower Park**	**Recreation** **Intensive**		
10.4	**Coastal Ecological Corridor**	**Recreation** **Extensive** **Natural environment**	**Protection** **Flora / Soil** **Habitat restoration**	
10.5	**Landfill Park**	**Protection** **Soil/water**	**Recreation** **Extensive** **Remote experience**	
10.6	**Production Forest**	**Silviculture**	**Recreation** **Extensive** **Remote experience**	



Policies:

1. Zoning shall recognise the dominance of one particular use. Compatible secondary uses will be superimposed where appropriate.

2. Changes in zonation will be made with public consultation except where the advisory committee considers the changes insufficient in importance to warrant this procedure.



8.4 Off-Road Vehicles and Motorcycles

Policies:

1. Off-road vehicle use will be restricted to organised club events run by the Canterbury Landrover Owners Club. All non-beach activities are to be confined to a site located on the Landfill map, page 48.

2. Areas will be designated for off-road vehicle use. Four-wheel drive vehicles shall be limited to exiting the forest via Landfill Road to access the Waimakariri River bed. Provision is to be made for five evening runs per annum, to be organised by the Landrover club. No buildings or containers are to be established on the landfill site without gaining a resource consent.

3. All 4WD vehicles will be registered, warranted and fitted with a spark arrester for the duration of the event. Events must be registered with the Forest park ranger 1 month in advance. Use of the forest park roads may be permitted.

4. Access to the beach shall be gained with permission via a locked gate at 20th Avenue. Beach use shall be restricted to a length of approximately 50 metres either side of a line out from 20th Avenue.

5. All vehicles shall be prohibited from using the beach above the Mean High Water Mark.

6. Motorcycles will not be permitted within the forest park.

Explanation

Limited off-road use occurs and is restricted to organised club events. Because of the potential conflicts with other recreational users and conservation values (impact on the environment, particularly the coastal zone) this recreational activity has been given a designated area in which to conduct its activities. In addition to this area the use of these vehicles is confined to existing forest roads and in specified localities See 10.5 for possible 4WD route through Landfill site.

The new 4WD route will be determined when the landscape development plans for the Park have been finalised. The route currently follows Uniform Road through the proposed Coastal Ecological Corridor, (see Access and Tracks map at Appendix 3).

8.5 Mountain Bikes

Policy:

• Mountain bike users will be made aware of track ettiquette, for example, giving way at intersections, looking out for runners and other users. Two other important rules include keeping to the track and wearing of helmets.

Mountain bikers as with all other park users can make use of the alpha-numeric street names as a guide to navigation. See landscape development plans in section 10 and the Access and Tracks map at Appendix 3.

8.6 Domestic Animals

Pack Animals

Policies:

1. Horses will be permitted on special routes established for their use.

2. Horses are prohibited in areas e.g picnic areas other than those designated for their use Jumps and barriers may be provided.

Explanation

The present level of activity is such that disturbance or conflict with other visitors is slight, but considerable or marked increase in use may require restriction of activities to specific localities.

Dogs

Policies:

1. Domestic dogs are permitted in the forest areas
2. Use of dogs may be authorised for special purposes such as search and rescue, research and for safety of disabled visitors.

The permittance of dogs must be balanced against the threat dogs pose to conservation values and other users of the forest park

8.7 Orienteering

Orienteering is not permitted in biologically sensitive areas such as the natural environment zone, but is permitted elsewhere.

Casual use of the park for orienteering activities will be permitted.

Investigation of orienteering routes, and the use of mountain bikes for orienteering, within the forest park will be explored in association with the Peninsula and Plains Orienteering club.

8.8 Group and military usage

Policies:

1. Request for intensive use of localities by large organised groups may require approval from the Parks Manager and each will be examined in terms of its impact on park values, including other users.

2. Specialised training of military personnel will be permitted by the Parks Manager where the effects on other users will be minimal, and where the impact on park values will be negligible.

3. Areas may be made available for training the military in particular skills for example, bridge building, that may be of benefit to the park.

4. Large scale military exercises will not be permitted within the park.

Explanation

Large groups such as school parties or major sports events occasionally make use of part of the park. These can be disruptive to other users, may place undue stress on facilities or may cause locally severe habitat impact. For these reasons special permission may be required from the Parks Manager for groups over 15 persons so that other users can be kept informed and problems avoided.

Large scale military exercise are generally considered incompatible with park values. Authorisation may be given where supervision is adequate and the activity does not impair park values or disadvantage the opportunities for other visitors.

8.9 Access

Roads are an important part of the forest layout, allowing for the cycle of establishment, silviculture, mensuration and finally harvesting. The road system expanded with the development of the forest (Geerkins 1988). In the 1940's and 50's firewood was taken from the forest to fuel the furnace for the tepid baths in the inner city. The furnace burnt the inner city's combustible refuse to heat the swimming baths. The ash was laid on the forest roads including waste such as, assorted metal and nightsoil cans.

Access to the forest will be improved by the provision of good signposting and suitable maps. Maps could be sold to offset production costs. All signs and notices should be of a uniform standard and attractive appearance with a crisp, modern design and lettering, succinct, large enough to read, proclaiming what visitors are encouraged to do, rather than what is forbidden.

Policies:

1. The public are to be permitted unrestricted foot access, cycle access, equestrian access and non-motorised access within Bottle Lake Forest Park at all times, subject to defined limitations and restrictions from time to time.

2. Access restrictions may be in place to particular areas for management purposes such as rerouting tracks, track maintenance, construction of recreational facilities, landscaping, rehabilitation and enhancement work or for approved special events.

3. Access may be also be restricted in the interests of public safety during periods of forestry operations such as tree felling, pest control operations and in the event of emergencies such as fires and storms.

4. Unauthorised motorised vehicle access within the forest park will be prohibited.

PART V: DEVELOPMENT PROPOSALS

Objectives

- To proceed with recreational development in accordance with regional recreational needs.
- To ensure the provision of facilities for the public to enhance opportunity for education, recreation and enjoyment.
- To ensure that recreational development of all scales, within the park is restricted to areas where the development is compatible with the assigned recreational subzone(s) of the area(s).
- To specify in detail, the recreational development proposed for the forest park for the next 10 years.

9 *Design considerations*

9.1 User needs

Planning proposals based solely on current recreational trends which for example, may favour such popular things as wilderness concepts, should be weighed against the very different and unpredictable trends and demands for recreation in the future. Wilderness concepts which favour low economic budgets should also be weighed against more developed parkland landscapes which are more costly current term propositions to consider. Such developed landscapes, if planned and done now, would however be infinitely cheaper than passing the cost responsibility into the future when, for example, massive adaptation of the landfill site would be required.

It is therefore considered that a diversity of present uses and flexibility for future unknown demands must be catered for.

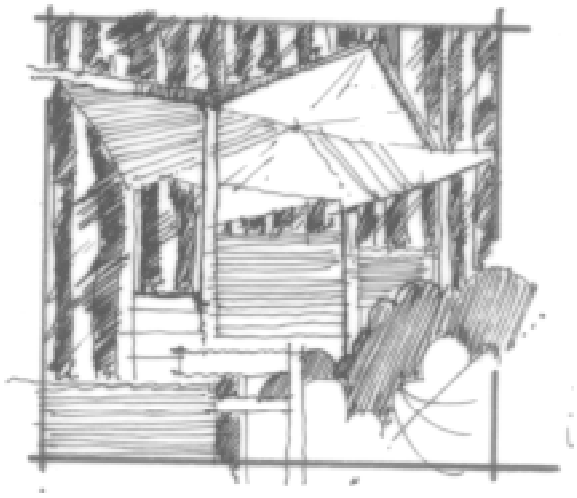
Policy:

- To take into account existing opportunities for recreation experience within the region when considering the provision of Park recreation facilities.

9.2 Design Principles

The amenity of the forest park is a product of the many and varied uses, elements and landscape features within and surrounding the park.

Collectively these activities and landscape features represent a major source of the values that people derive from the forest areas. To ensure harmonious development of the park facilities and structures, a set of design principles have been proposed to evaluate the appropriateness of both existing and new developments.



Design Principles: (adapted from DoC, 1991)

1. *User needs/ preferences:*
   In order to provide visitors with a quality recreational experience their requirements and personal needs must be met. This principle must be balanced by the need to preserve natural values and minimise conflict between visitors. To this end the optimal requirements of visitors, in other words, user preferences cannot always be met.

2. *Character:*
   The natural and cultural values of an area must be recognised in design. The aim is to ensure that design elements harmonise with the landscape and enhance the experience of it.

3. *Form:*
   Structures should fulfil their intended functions as simply as possible. Elaborateness does not fit easily into a bold and basic landscape. Structures must be kept to a minimum so as not to impose on the landscape and detract from it. This also retains an atmosphere of remoteness and naturalness.

4. *Scale:*
   Structures which are developed in large scale landscapes must relate to both the setting and the intended users.

5. *Durability*
   Ability to withstand unsupervised use. 'Factor in' estimates of usage.

6. *Continuity*
   Common design features reinforce themes and messages.

7. *Colour*
   As for Character and Continuity.

Recreational use shall be primarily resource orientated in character, requiring only low key facility development. Opportunities for participation by disabled persons shall be an integral part of recreational development.

Fire Pond Development

10 DEVELOPMENT PROPOSALS

10.1 Fire pond picnic area

The fire pond picnic area concept promotes revitalisation of the pond itself and immediate surrounds providing a more permanent vegetation pattern of exotic, evergreen and deciduous broadleaves and conifers, with underplantings of native species. This area is a popular destination for children and family groups, seeking a short forest walk to a destination point, where picnics and activities can then take place with an assured degree of seclusion and tranquility. The mountain bike track and horse trail pass through this area as well.

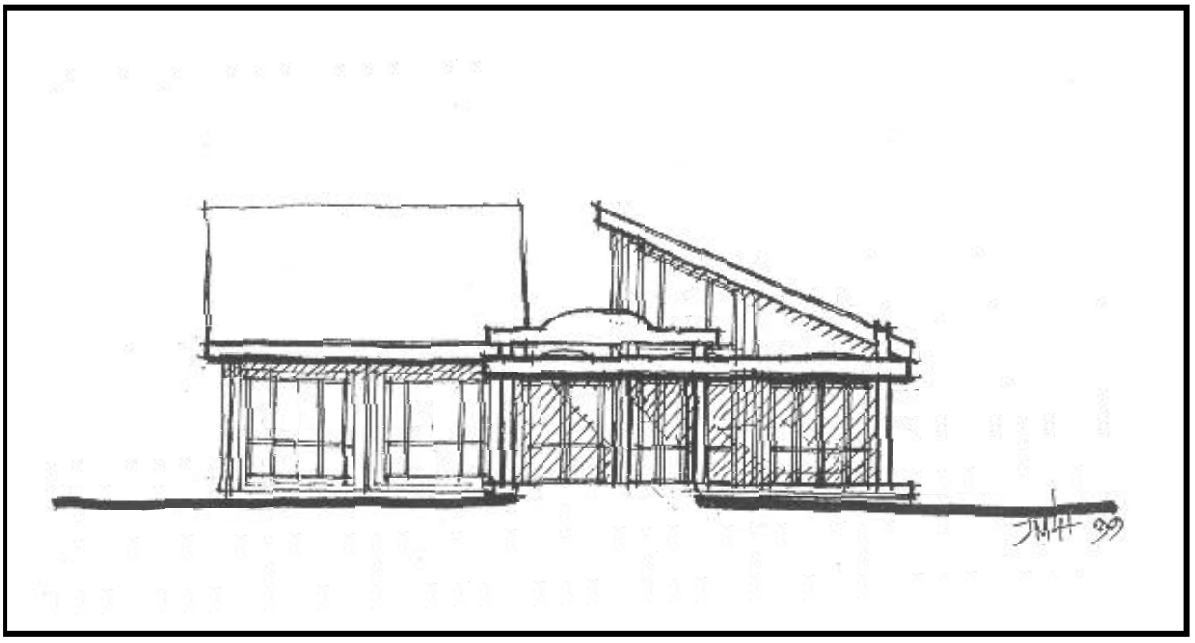
The pond already has gold fish released into it and further enhancement will more than likely serve as a stop over for bird species travelling from the Port Hills and Estuary to Brooklands Lagoon, providing yet another value to the recreational experience. A shallow ephemeral stream linking the two existing ponds could be excavated to create a wetland habitat in association with timber landings which would provide interpretive and educational opportunities.

The total area for the concept plan is approximately 2ha. Of this around 1ha of young pine trees would need to be removed, or alternatively selected pockets or groups could remain.

The primary purpose of the fire pond is to provide water for fire fighting and that any enhancement for recreation purposes will be compatible with its primary purpose in terms of accessibility.

Looking north-west over the current fire pond.

Park Headquarters Development >



Elevation of proposed Visitor Centre due to open June 2000- HQ Development

10.2 Park Headquarters development

Development of the park headquarters is the most intensive development planned for the forest. Envisaged here is a multiple use intensive recreational area serving a range of recreational users. A transition from passive use picnic areas and labelled arboretum trails to active recreational forest track users, equestrian activities and field based sports activities occurs in a themed forest setting.

An entry realignment branching off the landfill road provides easy and legible access to the forest park. Waitikiri Drive itself could be closed in the future with the proposed Forest Park Drive providing access to the Windsor and Waitikiri golf courses.

A series of picnic areas each having a distinctive vegetative theme, branch off prior to the headquarters area. Continuation of the forest road leads through a semi forested area with glimpses of open and closed spaces, the possibility of some ground recontouring to create mounds, different vegetation and planting patterns focussed on enhancing the amenity of the area. The road terminates at the existing car park area where recreational users of the forest can access tracks into the forest area. Provided also is a bus turn around and drop off area for visitors and tourists arriving at the visitors centre.

To cope with the increased numbers of Forest Park visitors forecast, a new purpose built visitors centre is required. Plans have been finalised for some time and construction is awaiting funding availability. The Visitors Centre will provide an information resource for the Forest Park and for Coast Care. Information to be displayed includes silviculture and tree identification, outline of recreational opportunities, the ecology of the forest park and fire precautions and other safety provisions. It is envisaged the centre will be used as a venue for lectures, local community groups and provide a resource base for organised events.

An arboretum is planned for the forest, primarily as an educational and functional facility. It is proposed that various trees are grown to represent a range of values such as botanical or ethnobotanical value, ecological value (habitat, nectar and food source, and fire resistant qualities), and functional qualities. Visual values will be taken into consideration also when the layout is considered.

Also proposed for this area is a district park to service the growing needs of amalgamating sports codes and increasing residential subdivision within the locality. This will act as a large open space node between the park headquarters area and Rothesay Recreation Corridor. The link with the Forest Park provides an alternative venue for family members attending sports activities and a valuable training ground for sports teams.

Approximately 6ha of the 30 ha area around the current HQ is free of forest production plantings. This leaves approximately 24ha that would need to be removed from forest production. It would be desirable for some areas of these larger trees to remain to create the grand forest entrance and a framework within which to begin to create the park setting. Similarly, the connection to Rothesay Recreation Corridor will also necessitate removal of some forest production area, although this is not anticipated to be an extensive area.

City Plan hearing results were released My 1999. The two areas of L1 zoning have reverted to Rural 1. These areas can now be retained as part of the Forest Park.

A compact freestyle BMX track sculptured from hardfill (dirt trail) is currently under construction adjacent to the main car parking area. It is due for completion in October 1998.

Rothesay Recreation Corridor

Rothesay recreation Corridor suburban edge

10.3 Rothesay Road recreation corridor

The corridor is essentially based around a 100 metre wide strip of land extending from and running parallel with the residential boundary edge which is the unformed Rothesay Road.

The idea is to create a number of recreational tracks that pass through a series of distinctive vegetated areas (open woodland, native coastal duneland bush). Small open space nodes along the tracks would provide the opportunity for rest and meeting places.

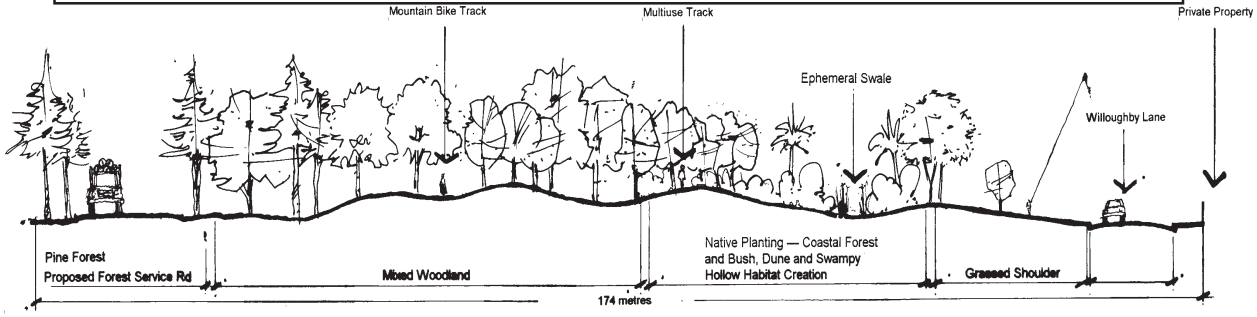
The corridor would link the proposed park headquarters area with future district parks, Landfill Park, Travis Wetland and Pegasus Bay walkway as well as existing and future adjacent residential areas. At the northern end of Bower Avenue Broadhaven Park is to be extended by the construction of two sportsfields north of Rothesay Road thus forming one of the more intensive acitivity nodes of the corridor.

Variations relating to the location of Broadhaven Park and the routing of access roads will be investigated. Alternatives to the design illustrated may result in fewer cars using Bower Avenue. Bower Avenue will however, remain as an acccess road into the Forest Park as per the City Plan and as illustrated.

Some wetland habitat creation is possible. Sensitive earthworks would enhance and strengthen existing areas of dunes to create a system of hollows linked by an ephemeral swale.

Extending the corridor may be a future possibility depending on perceived need, land availability, silvicultural operations and finance. The possibility of creating a recreation corridor linked to and including Heyders Road will be investigated.

Rothesay and the Ecological Corridors will become permanent features of the landscaped forest edge.



Sketch Representative Cross Section
Through Rothesay Recreation Corridor Section a-a

Coastal Ecological Corridor

10.4 Coastal ecological and amenity corridor

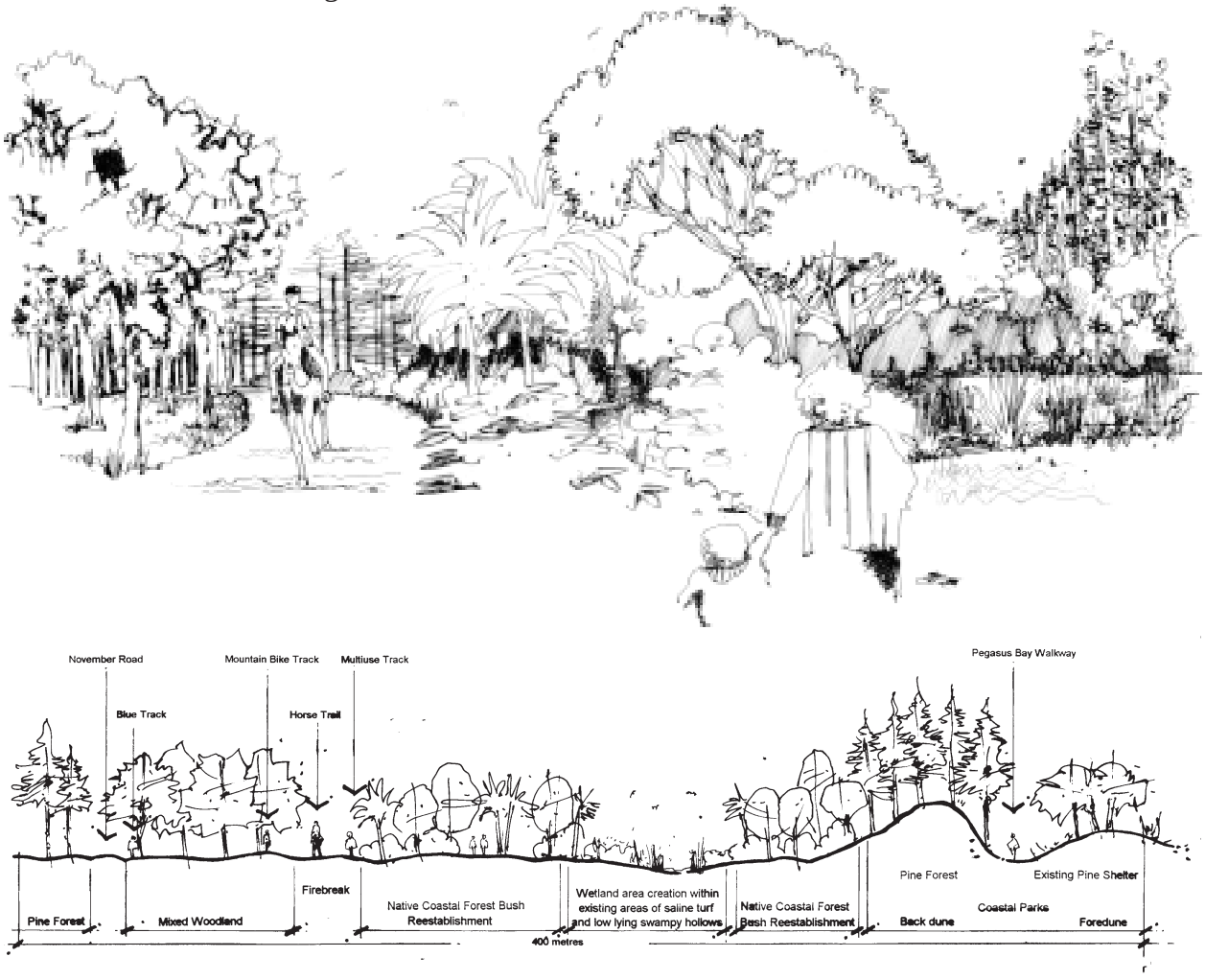
The development proposed for the coastal area, extending from the landfill north to Spencer Park (13th Avenue), emphasises the natural environment and amenity values of this area.

The idea is to rehabilitate the vegetation and habitat sequence of this coastal margin, to provide a continuous wetland habitat and nesting corridor for birds travelling from the estuary to Brooklands Lagoon. This area contains the most comprehensive sample of ecological remnants of the coastal environment, reflecting transitional vegetation patterns between foredunes, ephemerally wet dune slacks or hollows, older backdunes and more permanent wetland type areas, to sandplain and forest.

The opportunity exists to enhance public appreciation of ecological values through a system of track networks that move in and out of the various topograhical and vegetation sequences, providing a range of different experiences. This complements the track network through the forest proper and the dynamic experiences of an ever changing landscape.

The concept plan covers an area of some 25ha of which a large amount is currently being felled. It would be desirable to remove this area from production. The enhancement of this corridor will be co-ordinated with subsequent tree felling.

Coastcare is responsible for the maintenance and enhancement of the eastern edge of this corridor. This seaward edge extends 40m westward of MHWS.



Sketch Representative Cross Section
Through Coastal Ecological Corridor Section b-b

Note: Cross Sections are **indicative** only. Proposals shall be confirmed by further site research and topographical survey.

Landfill Park

10.5 Landfill Park

On completion of each landfill stage, including rehabilitation of vegetative cover the area is handed back to the Parks Unit for assimilation into the forest park. Since the metro refuse sites are unsuitable for production planting due to the methane trapped beneath the surface it is intended that protection planting, in conjunction with recreation and amenity values will be the predominant use of the area.

The Landfill Park Concept Plan illustrated is centred on the multiple use philosophy. It provides a focal point for the different users of the Forest park and links up to the Rothesay Recreation Corridor, Coastal Ecological Corridor and the forest park proper.

This current concept makes use of the contours as they are at present. As stage 2b is filled there is the opportunity to direct the height and spacing of fill and cappedmaterial to suit the requirements of the management plan. See Landfill stages map, section 7.1.

The landfill concept caters for walkers, 4 wheel drive users, mountain bikers including a dual slalom course, horse trekkers, orienteers and picnicers. Provision will be made for wheelchair users.

The site incorporates a mixture of the natural and artificial encapsulating the use and former uses of the park. Likewise, planting includes a mixture of endemics and exotics set out to provide naturalistic as well as bold artificial features. Sheltered areas have been allowed for to provide picnicers and other passive recreationalists shelter from the easterly wind. Open areas have been left around the higher ground to take advantage of the superb view taking in the Southern Alps, Port Hills and the city.

The eastern area in grey (formerly Stage 3) is part of the coastal corridor foredune system. This concept makes use of a partly scooped out area by converting it to an interdune wetland.

Future panorama from top of Landfill Park

11 Roads and Tracks

11.1 Road Development

Refer to concept plans (sections 10.2 and 10.3).

Policy:

1. A new road (Forest Park Drive) shall be created off Landfill Road to provide the primary entry area to Bottle Lake Forest Park.

   Explanation:

   A new road is planned providing access to the forest park. This anticipates the significant increase in actual and potential park use and associated traffic volumes that will become increasingly beyond the ability of Waitikiri Drive, a local road, designed for residential commuter traffic, to service. Moreover, a significant increase in traffic volumes would also detrimentally affect the amenity values of the Alpine View and Waitikiri Drive residential area.

2. Bower Avenue is to be developed and extended north from Broadhaven Avenue to link with Rothesay Road thereby providing parking bays and access to Broadhaven Park landfill recreation area and the proposed Bower Avenue development.

   Development of this road shall remain informal and shall not include kerb and channel or hotmix seal until such time as the future of Waimari Golf Course is determined.

3. Park Road is planned to be developed extending from the corner of Bower Avenue and Rothesay Road east along Rothesay Road to Waimairi Beach.

   Development of this road will provide a narrow (6 metre) informal access route to the beach for vehicles.

Sketch showing representative view along Forest Park Drive towards picnic area.

11.2 Park Entry Areas and Access Points

Refer to access map, Appendix 3.

Policies:

1. A hierarchy of park entry and access points will define key focal areas for visitor activity and recreation within the Forest Park.

   Explanation:

   Each park entry area will also be developed and promoted with a theme to assist in easier user identification, for example, family amenity area within the Rothesay Recreation Corridor.

3. Secondary park entry areas shall be developed at Spencer Park, the end of Bower Avenue and off Landfill Road.

   Explanation:

   These areas will be developed in conjunction with substantial car parking provisions, major track junctions and specific recreation use areas.

4. Minor points of access shall be developed off Queenspark Drive, Regalwood Close, Flaxgrove Terrace and Aston Drive.

   Explanation:

   Development will be oriented around pedestrian and cycle requirements of the immediate residential area with small scale parking at some locations.

5. Barrier mechanisms, vegetative or constructed, to prevent unauthorised vehicle and motorcycle access within the Forest Park and onto Waimari beach shall be provided at all entry and access points.

6. Well located and maintained pedestrian accessways shall be established at regular intervals and where access is in demand.

   Explanation:

   Provision of these accessways will cater for pedestrians and cyclists primarily from immediate residential surrounds, for example, Flaxgrove Terrace.

7. Pedestrian and cycle access share same access route to the beach.

8. Consideration shall be given to fencing either side of accessways to prevent diversions. Signs shall be installed advising of obligations.

Horse and vehicle access

9. Horse access will be provided for and permitted only at the following locations:

   - Main park entrance
   - Bower Avenue/Beach road
   - Spencer Park/Heyders Road
   - Spencer Park beach area

Explanation:

Due to the relatively extensive areas required for parking vehicles and horse floats, and the generally desired separation from other vehicles, it is proposed to cater for these requirements in key areas where space is not limited and track provision for this activity is provided. Because of the nature of the activity and horse muck it is not considered appropriate to encourage excessive use of residential subdivision streets.

10. Vehicle and horse beach access from Bottle Lake Forest Park shall be restricted to identified access points. These shall be located at points which are convenient for the user as well as maximising dune and vegetation protection.

Identified beach access points:

- Spencer Park (vehicle access ramp),
- End of 13th Ave,
- 20th Avenue (gate access point requires a key to access beach),
- November Road end (currently stable unrestricted sand access route),
- Rothesay Road/Waimairi beach (proposed beach access route).

11. Vehicles and horses shall only access the beach via approved access ramps. Currently access exists only at Spencer Park in summer, and Waimairi Beach park and across surf club accessways in winter. A new access ramp shall be constructed for Council maintenance vehicles at Waimairi Beach.

Vehicle and horse accessways through the dune zone will be constructed with material designed to allow the natural process of accretion and erosion. Wind funneling and dune blowouts are the likely results of not allowing this natural process to take place. Where these areas are stable no material may be necessary.

Local access, Rothesay Recreation Corridor

11.3 Vehicle Parking

Refer to concept plans and Access map, Appendix 3.

Policies:

1. Vehicle parking areas shall be provided at identified park entry points as outlined below:

Main Forest Park Entrance

Forest Park Drive	(Provision for 70 cars)

Secondary Park Entry Areas

Spencer Park	(Provision for 60 vehicles)
Bower Avenue	(Provision for 60 vehicles)

Minor Forest Park Access Points

Queenspark Drive	(Provision for 15 vehicles)
Regalwood Close	(Provision for 10 vehicles)
Aston Drive	(Provision for 10 vehicles)
Flaxgrove Tce	(No parking available, local pedestrian access only)

Any increase in formed carpark provision shall be subject to survey information of park use and vehicle numbers over a relatively extended time frame.

2. Carpark areas will be sensitive to the surrounds. The scale and design shall reflect the landscape concept for the particular area or zone and the anticipated level of use.

3. Grassed informal overflow carparking areas will be permitted adjacent to picnic areas, allowing direct access off the main forest park entrance road for picnickers utilising these areas.

4. Access to the main forest carpark entrance area will be restricted to daylight hours as determined by the park rangers for reasons of security.

5. Where necessary vehicle access to other carparks will be restricted at night by locked gates or chains. These can be patrolled by local residents, rangers and security wardens.

Explanation:

Screen planting will be limited to ensure casual supervision of car parks by passing traffic and residents is still possible.

6. Parking areas suitable for buses (turning circle and load bays), will be provided at the forest park headquarters area.

11.4 Track System, Network and Linkages

Refer to Concept plans and Access and Track map, Appendix 3.

Bottle Lake Forest Park, Chaneys and Kainga are separated by land in private ownership. Long term the intention is to provide for a linked pedestrian, equestrian and access way between these forest parks, through to the Waimakariri River, returning via Brooklands Lagoon.

Policies:

1. A network of linked tracks will be constructed and maintained throughout the park. The length, degree of difficulty will vary and will be arranged in inter-connected loops to avoid returning by the same route thereby providing a choice by which to return.

2. Tracks shall be located in a manner that maximises the range of recreational experiences whilst protecting the landscape character and other values.

3. To locate tracks where appropriate to enable easy and well marked access from adjacent residential areas.

4. Track systems shall be developed recognising the differing needs and requirements of different user groups. Park Rangers will consult with user groups and expert advisors in this matter.

5. Track designs which minimise user conflicts will be unvestigated as possibilities for new and existing tracks.

6. Where necessary, due to forestry operations and/or management practices, existing tracks will be re-routed or rehabilitated.

7. The track network shall link recreation areas and open space inside and outside the forest park providing a comprehensive linked open and recreational space system so that open space loses its separating character and becomes a link.

8. The track network within the park will complement and where possible link with other tracks e.g. Pegasus Bay Walkway, Brooklands Lagoon Spencer/Seafield Park.

Tracks will be identified clearly and separately on maps for each user group, for example, a walking track map.

11.5 Track Classification and development

Policies:

1. A standard three part classification system shall be established for all tracks (mountain bike, walking, horse tracks) to indicate the degree of difficulty of the various tracks. This is intended to provide a general indication and guide to the degree of challenge a track presents the average user, not to dictate what users are capable of.

For example,	Easiest	**E**
	More difficult	**Md**
	Advanced	**A**

E: *Easiest:*

'Relatively short and well formed, high standard tracks. A path requiring limited skill/ experience with little challenge to travel. Suitable for people of all ages and fitness levels.' State info particular to activity for example, walking track of a width to allow visitors to walk two abreast. May be surfaced to withstand frequent use. They may form part of a nature walk or interpretation opportunity.

MD: *More difficult:*

Tracks of varying degrees of terrain, steepness and length, suitable for persons of average fitness. Of a width comfortable for single file walking/riding. They will provide access to areas of interest within the reserve, and will be maintained to a good standard,

A: *Advanced:*

Tracks serving similar purpose to those of more difficult, but maintained to a lower standard and designed with preservation of the environment of higher importance than ease of passage. Some distance from facilities areas, suitable for persons of a good average fitness.

2. Technical and physical difficulty shall comprise the basis in establishing a classification for a particular track. Consideration will be given to track features, track condition, definition of route, alignment, width, length, amount and kind of natural barriers to be traversed, steepness of grade, degree of difficulty of passage, volume of traffic likely to be carried, and the interpretative opportunities along the route.

   These considerations will also comprise the basis for track evaluations and shall include:
   a. Technical features - track surface, trail alignment, width, clearance, definition of route number, length and grade of downhills,
   b. Physical difficulty - total distance of trail, number, length and grade of each uphill section.

3. The distribution of track classification levels should be closely considered in relation to recreational settings and zonings in order to provide a full range of recreational opportunities.

4. A naming system shall be established for tracks which is indicative of classification and type and represented by a unique symbol, for example,
   - Mountain bike track Diamond back track, Ridge runner track,
   - Horse track Cardigan bay track,
   - Walk track Cone track, Two cone track,

   or applicable to track size and distance, e.g. sparrow track, albatross track, harrier track, tern track.

5. User groups and clubs shall be invited to assist in establishment of track classification ratings and names. Sponsorship may form part of the track naming system

6. Track systems shall be designed that provide a variety of options for use. Track systems shall comprise loop tracks, through routes or combined systems providing many user opportunities.

7. A detailed track plan shall be prepared for Bottle Lake Forest Park which will be continuously updated ensuring tracks are maintained to their standard classification allocated.

11.6 Track Markers

Policies:

1. Blazing of trees will not be permitted for initial track reconnaisance or for final route marking, for either rangers or special events.

2 Signs and notices indicating track information will be located at key locations at prominent trail heads, trail intersections and where interpretative opportunities present themselves. Not all access points can have signs due to the number of access points.

3. A standardised track marker shall be developed in timbered areas, it shall be an isosceles triangle. Galvanised steel or aluminium triangles can be used. Paint with reflective orange paint.

4. Existing track markers that do not conform to this policy should be replaced with approved markers when they next require maintenance or re-routing.

Proposed New Tracks

Refer to concept plans and Access and Tracks map, Appendix 3.

PART VI FOREST PARK ADMINISTRATION

General Objective

- To maintain flexibility for future activities or management priorities.

12 Land Transactions

Objectives

- To identify and pursue revenue-earning opportunities that are compatible with the aims and objectives of this management plan.

12.1 Park Boundary Adjustments and Park Extensions

Policies:

1. Further land acquisition may be warranted to improve access and provide for more rational boundaries. One of the possible causes of boundary adjustments is road improvements.

2. Extension of the forest park would be justified where protection of soil and water, values for recreation, protection of natural flora and fauna, or the administration efficiency of public land would be enhanced.

3. Additional land for timber production will not be a consideration in extension of the forest park/land acquisition but may be a legitimate use of such land.

4. As a general rule only contiguous areas of land will be incorporated into the forest park.

5. Provision of adequate buffers will be made between park activities, conservation areas, forestry, landfill waste disposal, biosolids and residential subdivisions. Preference will be for natural boundaries.

6. Fencing may be considered in consultation with neighbouring land owners in order to deter park users from tresspassing onto private property.

7. Where necessary and as opportunity permits negotiations will be undertaken with adjoining landowners to achieve mutually advantageous natural boundaries.

12.2 Road closures and removals

Most of the legal unformed roads within the forest park have been closed. However several unformed legal roads remain within the park.

Unformed legal roads are generally vested with the territorial authority, the City Council. However rationalisation some years prior have seen a number of closed roads that do not have title and hence may be vested in the Crown. This may simply require the council to apply for title. Where roads border adjacent properties this would be necessary to prevent the loss of land.

Rothesay Road was originally retained to provide a link or vehicule route for the Parklands area should it require such a connection with respect to urban growth to the minor arterial road Prestons road. This was to form part of the link road system. Closure of part of Rothesay Road will allow development of a recreation corridor outlined in section 10.3. Road frontage is

required to be provided for the remaining two lots undeveloped hence the reason for retaining Rothesay Road open between Willoughby and Royal Park Drive.

Policy:

- Titles will be obtained for stopped roads.

12.3 Rights of Way, Easements and Network Utilities (public works)

Policies:

1. Any access across private land will be clearly signposted. Access may be restricted at certain times due to farming activities.

2. Access provision shall not include motor vehicles.

3. Public utilities and easements shall be as far as practicable be kept away from visually or ecologically sensitive areas and wherever possible cables and lines placed underground.

4. To seek the co-operation of utility network operators in the design, location and route of all utilities and ancillary buildings or structures.

Further details are listed in Appendix 1.

12.4 Leases, licences and concessions

Policies:

1. A licence is required for the long term use of a facility or area by a club or recreation group.

2. Concessions for commercial activities within the park will only be granted where there is a genuine need in terms of park management, or where they enhance and provide for or service the recreational use of the park.

3. Concessions may only be permitted to be located at the main and secondary park entrances.

Further details are listed in Appendix 2.

Wagon Wheels concession (Photo: The Press)

13 OPERATIONAL ACTIVITIES

Objectives

- To ensure park management maintains good communication with recreation groups, the local community, adjacent landowners and the Selwyn Plantation Board.

13.1 Staff and Ranger Services

Scheduling and booking of recreational user groups in the forest park is handled by the Council's Leisure Unit. When necessary certain areas may be booked in consultation with the forest park ranger.

Other ranger duties include-

- Provide education information, brochures and maps,
- Provide interpetative talks to interest groups, schools and casual park visitors,
- Patrol the forest park and ensure compliance with by-laws and the Reserves Act,
- Liaise with users, community groups and parks management,
- Investigate pest problems,
- Recovery of wildlife,
- Fire duties and other emergency assistance, and
- Carry out ranger school holiday programme.

Additional ranger presence, use of honourary wardens and other methods will be investigated as a means of combating vandalism within the Park.

13.2 Management Advisory Committee

An advisory committee consisting of a dozen members was set up in 1996. Members meet twice a year at the park headquarters and consist of user group representatives such as runners, horse trekkers and residents groups, the Selwyn Plantation Board and the City Council. The main focus of the committee is to provide a forum for liaison and to air any problems, promote new ideas and communicate any changes or proposals for the park.

13.3 Visitor Health and Safety

Objective

- To ensure all reasonable precautions are taken for the health and safety of the public.

Under New Zealand's Occupational Health and Safety (OSH) regulations, both the City Council, Selwyn Planatation Board and concessionaires have strict and extensive safety obligations to ensure the safety of its employees and to provide a safe environment for visitors.

Certain safety rules apply in the forests and recreational users must be aware of those rules and take responsibility for their own and others safety. This is particularly important where a number of different groups which have the potential to conflict, use the forest at the same time, for example, giving way where tracks intersect.

Safety is paramount and because of the dynamics within the forests both the CCC and SPBL (in consultation with the CCC) reserve the right to restrict access to forests or parts of the forests where safety may be compromised.

Policies:

1. The Christchurch City Council will as far as possible bring to the attention of the public any special conditions or precautions that may be necessary. Of particular concern and significance are the possible dangers associated with commercial forestry operations, landfill and biosolid operations, fire and pest control. Stimulating public awareness of these issues is of considerable importance.

2. The need to be aware of drinking water sites when planning strenuous physical activity, or to carry ones own water supply, should be communicated. Existing drinking water sites will be included on the subsequent print runs of track maps available for sale at the Headquarters.

3. Rules / etiquette will be developed to cope with multi-use tracks and track intersections and these will be communicated to users.

4. All park equipment, structures and facilities intended for public use will be constructed and maintained to a safe standard, in accordance with the applicable standards.

5. Signage for evacuation procedures should be installed immediately.

6. Concessionaires and licencees will be expected to be responsible for public safety in respect of their operations.

7. Staff involved in the day to day management of the park will be required to hold an approved and current first aid qualification.

8. An emergency evacuation plan shall be formulated in consultation with appropriate organisations.

Fire

The Christchurch City Council Rural Fire Authority has responsibility for the Forest Park. A fire plan has been prepared which sets out procedures to be followed in the event of a fire and the facilities available to combat them.

During a fire related emerency the forest office becomes HQ for fighting fires. Rangers will keep a look out for visitors, ensure they leave the area safely, attend to any first aid necessary and prevent sightseers from entering the forest.

13.4 Education and promotion

1. Educational use of the forest park by the public shall be encouraged.
   Special emphasis will be placed on youth organisations to use the park for training purposes such as bushcraft and ecological studies.

2. Education programmes and literature will be designed to foster a fundamental understanding of the forest park environment including fire prevention and forest silviculture with the opportunity to gain hands on experience. Minimum impact resource use practices will be promoted which are consistent with the park environment.

3. Park outdoor education services will be developed in close cooperation with education agencies.

4. Interpretative programmes will be developed to facilitate the understanding and appreciation of the park in addition to rangers and others with specialist knowledge having contact with the public.

5. A comprehensive and ongoing collection of resource information and other relevant information will be assembled. Relevant information including the management plan will be available at the headquarters, service centres and on the internet.

6. Arboreta of both native and exotic species will be established adjacent to the information centre. Plant labels will be used on the walkways through the arboreta to assist with species identification, place of origin, product uses, botanical and silvicultural information.

7. Various interpretation techniques will be used to provide more indepth information to encourage a better understanding of plantation ecosystems.

Park interpretation will involve three main approaches:

- Vistors centre and displays,
- publications - maps, pamphlets, and
- public contact summer programmes, for example, guided walks and promotion of ‘Trail Day’ where different users come together to demonstrate their sport.

13.5 Budget and funding

Available Funding - Parks Unit

		98/99	99/00	00/01	01/02	02/03	03/04
A	**Operational Budget**						
	Expenditure	144,519					
	Revenue	9,220					
B	**Capital Budget**						
	Car parking / picnic area	36,000					
	Visitors Centre	45,000					
	Planting, barriers, etc.	7,500	12,000	5,000	20,000	50,000	
Waste Management Unit							
	Landfill -restoration			200,000	300,000	300,000	200,000
	Landfill Park - revegetation			225,000	225,000	225,000	225,000

Forecast Development Costs and Timing

	98/99	99/00	00/01	01/02	02/03	03/04
Firepond	15,000	20,000				
Rothesay Recreation Corridor excl. Sportsparks		10,000	10,000	10,000	10,000	10,000
Broadhaven Sportsparks			200,000			200,000
Spencer Park node	1,500	1,500				
Headquarters - Sports Parks						350,000
- Visitors Centre		110,000				
- Service Area Landscaping, car park, etc.	10,000	10,000	10,000	10,000	10,000	10,000
Coastal Ecological Corridor						50,000 (spread over 8-9 years)

Sports Park Costings -

- Irrigation Connection 100,000
- Topsoil 250,000
- Carpark 50,000

Irrigation for the HQ area sports park is likely to be $50,000 cheaper due to the closer proximity to a pumping station and infrastructure.

Timing for these projects is likely to change with the availability of funding.

The visitors centre as outlined in section 10 has been costed at $110,000. There is currently a Lotteries Board application pending for this amount.

Development of the HQ area is dependant on the zoning outcome in December 1998. Therefore development is unlikely to commence before July 1999. Landscaping and carparking construction will take place as an ongoing development to coincide with other developments.

The Broadhaven sports parks development is already underway but the four fields within the Rothesay Recreation Corridor will be dependant upon the subdivision completion. The development will be split with a gap of 2 years to allow for limited resources.

Funding should be allocated as a priority, above other components of the Rothesay Recreation Corridor, for the planting of a tree buffer to obscure the view of the landfill from existing and proposed housing adjacent to Rothesay Road.

The Spencer Park node will consist of an information / direction sign and demarcation between Spencer Park and Bottle Lake management.

The coastal edge of the Coastal Ecological Corridor development is currently being managed by Coast Care. This is set to continue into the foreseeable future. Limited resources are likely to prevent this development coinciding with others. Some money will be spent on identification and marking of significant ecological sites within this zone in the more immediate future however.

Other possible funding sources include corporate sponsorship and donations of plants, equipment and labour. The use of PD labour will continue. The implementation of the Community Wage may provide further assistance.

13.6 Research and Monitoring

Policies:

1. A detailed vegetation survey of the forest park will be undertaken to confirm the presence and location of native flora in order to make management decisions in relation to their status, protection, relocation, rehabilitation or any other management technique deemed suitable.

2. An avifauna survey will be undertaken for the forest park to provide an inventory of species utilising the forest and identification of appropriate management techniques to enhance their presence shall be embarked upon to determine habitat creation, food/nectar source and shelter.

3. Advice shall be sought from specialists on the invertebrate species of the forest park.

4. A visitor use survey will be conducted as a priority. This shall incorporate vehicle counts, track counts (mountainbike, horse and pedestrian) and type of use, as well as a range of other questions to assist with management and development of the forest park.

   This survey shall be conducted over a relatively extended timeframe in all seasons to establish levels of use and types of activities. Monitoring of vehicle numbers and track usage shall be conducted on a monthly basis.

5. University students shall be encouraged to assist in the above research.

14 MANAGEMENT PLAN PROCEDURES

14.1 Management Plan Process

An increase in visitor numbers has meant the production of a management plan as a means of coordinating and controlling activities on site is of greater importance. Initial submissions asking for ideas relating to the development and future activities were received and incorporated into this document. The Landfill Park plan was prepared after consultation with interest groups.

This draft plan will be open for public submissions for 2 months after which time they will be summarised and made available prior to any hearings. Once decisions have been made the final plan can then be produced and implementation dependant upon plan ratification can begin.

The resultant plan will be reviewed after a period of 10 years; 5 years depending upon necessity.

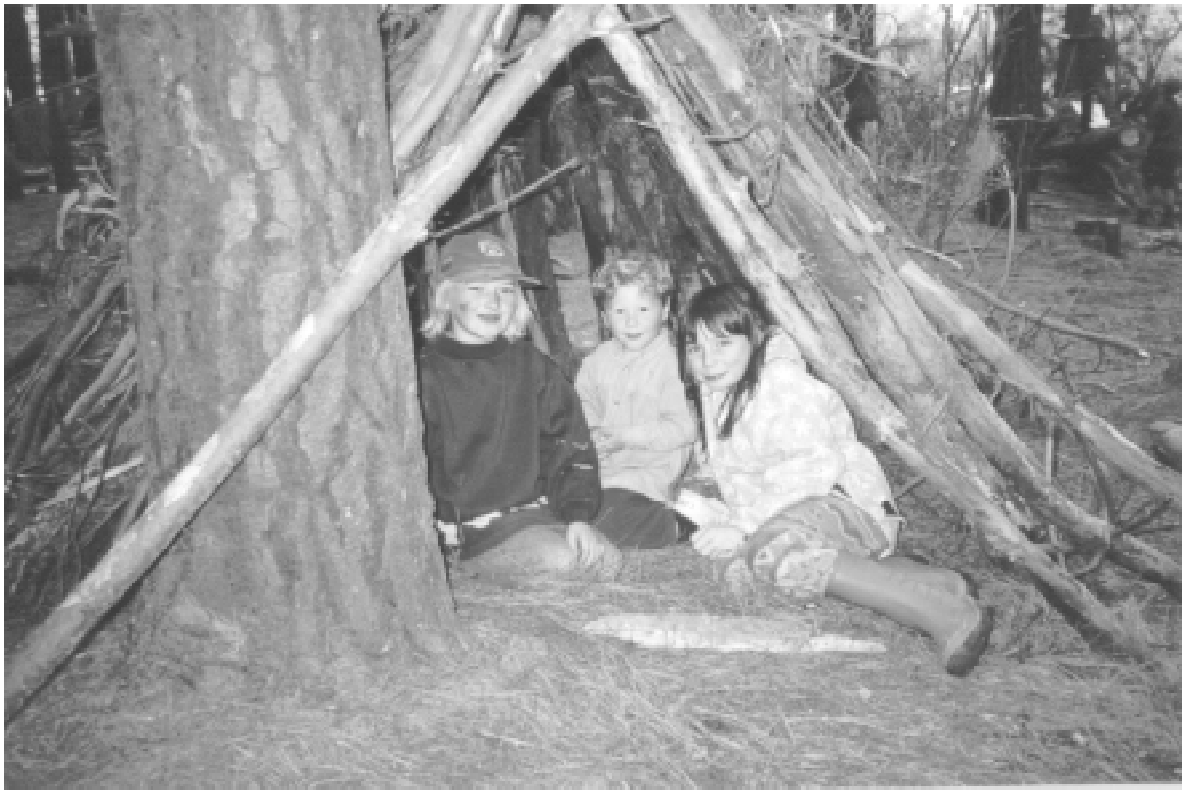
14.2 Management Plan reports and amendments

Policies

1. An annual report for the forest park shall be prepared for the period ending 31 July. All works undertaken shall be recorded in the annual report. Copies of the report shall be forwarded to the advisory committee and the Burwood/Pegasus and Shirley/Papanui community boards and shall be available for public perusal.

2. Review of the management plan will occur at five yearly intervals if there has been a significant change in the management objectives, and policies.

3. Major changes to the management plan within this five year period will not occur without public consultation. Minor amendments of a technical nature may be authorised by the Parks Manager.



Acknowledgements:

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Eric Banks
September 1998.

Appendices

Appendix 1: Further Network utility policies

Provision of network utility defined in sections 166-186 of the RMA, capable of being placed underground: (a) pipelines, (b) electricity transmission, (c) telecomunication or radio communication, (d) water distribution, (e) drainage or sewerage reticulation is required to be by way of underground reticulation onpark land.

Exceptions to undergrounding of services may be based on cost, technical constraints, accessibility for maintenance.

Any approval for a public utility in the park will contain conditions for factors such as siting, landscape design, type of structure or building, removal and restoration of vegetation, provision of power, construction of access roads, maintenance, and removal of surplus equipment incompatible with forestry, recreation, conservation objectives of the park.

Appendix 2: Further Concessionaire policies

1. To incorporate as part of the forestry licence agreement any area of land gained through acquisitions, boundary adjustments or gifting that may not be required for other purposes.

   If a need or demand for commercial concessions of a low impact and using non-motorised vehicles or equipment can be established, it will be considered on its merits in terms of this plan.

2. All commercial concessions granted have no exclusive rights of the forest ortracks and remain secondary to non-commercial recreational activities (public non-profit event).

3. The size of any commercial concession may be restricted to ensure that other private similar uses can coexist in the forest without causing ‘crowding’ to enable enjoyment of the forest by all.

4. Where a permit to carry out commercial operation within the park is granted the operator will be required to establish facilities or structures to a design and standard compatible with park values-conditions Any vehicle (non-motorised) used for transport of people must be certified for the intended use.

5. The operator must maintain a desirable and adequate public service and make reasonable payments to the park funds.

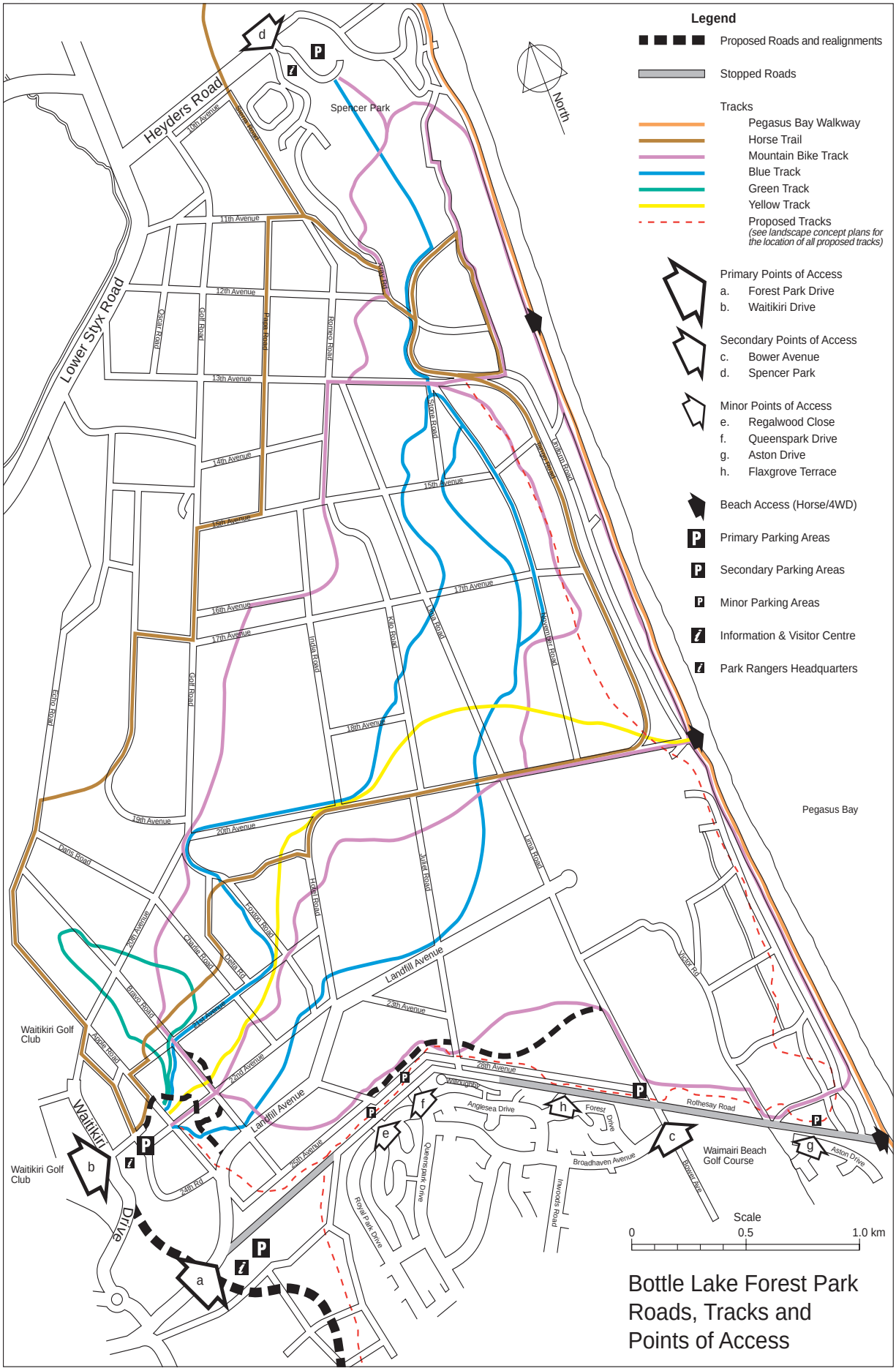
6. Licensees and concessionaires will be expected to be responsible for public safety in respect of their operations.

7. Any operation which is likely to result in the creation of a public nuisance interms of noise, effluent disposal or inconvenience to park users shall not be permitted.

8. Applications for temporary commercial uses such as filming and sales promotions or other commercial uses may be approved provided they do not conflict with the forestry operations, recreational park values.

9. Approved commercial activities require a licence/concession to operate on the property.

Appendix 3: Tracks and Access Map



Appendix 4: Native Plant List

Species	Common Name(s)
Acaena novae-zelandiae	piripiri, bidibid
Bryum billardierei	
Carex coriacea	
Carex dissita	
Carex pumila	sand sedge
Carex secta	pukio
Chenopodium glaucum	glaucous goosefoot
Cordyline australis	ti kouka, cabbage tree
Cortaderia richardii	toetoe
Cotula coronopifolia	batchelors button
Gastrodia minor	
Gastrodia sesamoides	
Gunnera arenaria	sand gunnera
Isolepis basilaris	
Juncus maritimus var. australiensis	sea rush
Juncus pallidus	wi
Lemna minor	duck weed
Leptocarpus similis	oioi, jointed wire rush
Microtis unifolia	onion orchid
Pittosporum crassifolium	
Pittosporum eugenioides	lemonwood, tarata
Pittosporum tenuifolium	kohuhu
Pseudognaphalium luteo-album	jersey cudweed
Pteridium esculentum	bracken
Schoenoplectus pungens	three-square
Schoenus concinnus	
Scirpoides nodosa	knobby clubrush
Selliera radicans	remuremu, selliera
Senecio glomeratus	
Senecio minimus	fireweed
Solanum laciniatum	poroporo
Sophora microphylla	kowhai

Appendix 5: Recommendations relating to native plant management

- No more works, including planting and lake excavation, new grading etc., except in logged areas, should be carried out without a prior inspection of the site in early summer by a qualified and experienced botanist, e.g. from the Parks Unit.

- Plantation management should be carried out with minimal damage and disturbance to the soil especially where there is major fern development in the understorey. Ideally each new coupe that is to be felled should be inspected in the late spring, before harvesting commences, to ensure that any valuable floristic elements are protected through site-specific knowledge rather than blanket restrictions. There are thought to be orchids and possibly other rare spring ephemeral species in the forest. Inspections prior to logging would enable a systematic search for these on a realistic and progressive basis.

- Coastal bush species should be progressively planted around the entire Bottle Lake plantation and refuse station (and along major walkways) for visual integrity, wildlife linkage, and as a fire barrier - evergreen species such as ngaio, karamu, broadleaf, fivefinger, mapou, and kohuhu will work best in this context. Other fire-prone species such as akeake and kanuka may be used in smaller amounts, but more prodigiously away from the plantation.

- Weed control in the vicinity should target grey willow (this freely seeding species is an extreme menace to any open wetlands in the area - including Travis Swamp), pampas grass, blackberry, and white poplar (which is spreading vigorously by vegetative means). If there are limited resources, the first priority is female grey willow which can be identified and dealt with in late August to October. Certainly it should be dealt with before major wetland creation is commenced otherwise the new surfaces and planted tussock species, such as harakeke, toetoe, and reeds will be overwhelmed by willow and blackberry. It is then much harder to control weeds when they are intertwined with the desirable species. Spread of pines should be controlled on Brooklands spit and elsewhere before they cover some of the best remaining sand slacks and shade out the largest populations of tauhinu and harakeke.

- All remaining fragments of dune slack should be located and protected by fences. Note that the most recent inspection was at a time when these slacks were under deep muddy water so it was not possible to tell if some small fragments of saline turf may have survived.

- After careful investigation some of the dune slacks should be restored. Initially this will be experimental as this has not been tried before. It is relatively easy to establish tall tussock swamps, but these turfy communities will be more of a challenge. The following steps are suggested:

1. Survey site to ensure nothing of value is going to be destroyed;
2. Establish weed control in the larger vicinity;
3. Propagate appropriate turf, reed, and rare species (e.g. gunnera, *Isolepis basilaris*) from other sites at Brighton or nearest known sources such as Lake Ellesmere;
4. Grade sandflats with a low angle, up to surrounding stable sand dunes, down to about 300 mm below the winter water table;
5. Establish appropriate boundary barriers;
6. Plant in turfs of each species at various levels in the scraped depression - around the edges of ponded water in winter and in the bottom of the scrapes as soon as the water has receded; taller species should be similarly planted around the edges.
7. Monitor and maintain sites weed-free.

Prepared by Colin D. Meurk.