

Lower Oratia Stream



Reserves Management Plan



Waitakere City Council
Te Taiao o Waitakere

Lower Oratia Stream

Reserves Management Plan

This document is a Management Plan for the reserves within Waitakere City that adjoin the Lower Oratia Stream. This Plan is intended as a guide for the future protection, use and development of these reserves. The Plan regards the reserves as part of an integrated natural system, but also responds to their individual management needs.

The project team is appreciative of the input from all who contributed to the consultation process undertaken in the preparation of this Plan.

*Parks Planning
Waitakere City Council*

Adopted by the Lower Oratia Stream Reserves Management Plan Subcommittee (a Subcommittee of the City Development Committee and the Henderson and Massey Community Boards)

27 October 2005

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INTRODUCTION AND BACKGROUND

1.0 INTRODUCTION

This document is a Management Plan for the reserves within Waitakere City that adjoin the Lower Oratia Stream. The Plan has been developed as a guide to the protection, use and development of the reserves, with an emphasis on managing them as an integrated network. It acknowledges the strong interconnections between the reserves and ecological values of the Oratia Stream. The objectives, policies and design guidelines described in this Plan should be seen as a framework for future works dependant on budgeting allocations for their implementation.

1.1 How to Use this Management Plan

The Lower Oratia Management Plan has been laid out into three parts:

Part 1: Introduction and Background

This section describes the Lower Oratia Stream reserves, including their legal title and current condition. It also explains the purpose of this Plan, and the statutory and strategic framework that sits behind it.

Part 2: Objectives and Policies

This section sets out and explains the objectives for the management of the reserves. This includes policies and the implementation that will enable these objectives to be met.

Part 3: Concept Plans and Design Guidelines

This section looks at the Concept Plans and Design Guidelines for the reserves of the Lower Oratia Stream and how these could be implemented.

1.2 Location of Lower Oratia Stream

The Oratia Stream has its source in the Waitakere Ranges. It runs through the lower lying hills and farmland of Oratia, and heads north through Henderson Valley. The stream converges with the Waikumete Stream at Serwayne Walk, Sunnyvale, before heading north through Henderson, converging with the Opanuku Stream to become Henderson Creek, which leads out to the Waitemata Harbour. This Management Plan covers the reserves adjoining the Lower Oratia Stream and includes private property that is proposed as a future reserve.

The Lower Oratia Stream is defined as the section of stream that extends between Parrs Cross Road at Oratia in the south to Great North Road in Henderson Town Centre (**Refer to Location Plan – Maps 1 and 2**).

1.3 Lower Oratia Stream Environment

The Lower Oratia Stream begins in a residential environment in the Parrs Cross area. Commercial and industrial land uses adjoin its western embankment further downstream at Sunnyvale. The Stream forms the boundary between commercial/industrial land uses in the west and residential to the east from Sunnyvale to Henderson.

The land directly associated with the stream itself is a combination of public esplanade reserves and land in private ownership.

The reserves that adjoin the Lower Oratia Stream begin in the south with the Oratia Esplanade, located on both embankments of the stream. This is the largest stretch of reserve along the stream (including the future esplanade reserves) as it extends



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over two kilometres from Parrs Cross Road through to Serwayne Walk and Millbrook Esplanade.

After Millbrook Esplanade, the stream winds through privately owned land until it reaches View Road. This section of the stream is wedged between Millbrook Road above the eastern embankment and commercial/ industrial land uses on its western embankment. After View Road, the land surrounding the Lower Oratia Stream becomes reserve again, with the Stream forming the western boundary of Hart Domain. Public reserves adjoin both sides of the stream from this point north with Vitasovich Esplanade Reserve on the eastern side of the stream, across from the Westfield Shoppingtown West City development (Check), a 'community' zoned car park, and Catherine Esplanade Reserve on the western embankment.

1.4 Description of Individual Reserves

The following reserve descriptions provide baseline information from which the objectives, policies and concept plans have been developed. These descriptions are brief assessments of the location and existing conditions of each reserve, along with detailed information on their opportunities and constraints. This baseline information includes issues such as: weed growth, amount of native vegetation, public usage, volumes of rubbish and debris, stream embankment appearance, safety and the location of activities that encourage public use (such as shopping centres, schools and community centres).

Catherine Esplanade Reserve:



Catherine Esplanade Reserve looking over the Lower Oratia Stream

Catherine Esplanade Reserve lies along the western embankment of the Lower Oratia Stream, extending from Hart Domain to Edsel Street. It follows the stream for approximately 340 m and is 0.4881 hectares in area. There is a covered footbridge that links Catherine Street (beside Catherine Esplanade) with Vitasovich Esplanade and Vitasovich Avenue. This is a busy thoroughfare, with the bridge utilised as a shortcut to and from two busy centres of activity, as it lies in the heart of a commercial area. There are clear sightlines across the bridge. A sign at the entry to the bridge highlights the Lower Oratia Stream, with the bridge itself offering a great opportunity to view the stream.

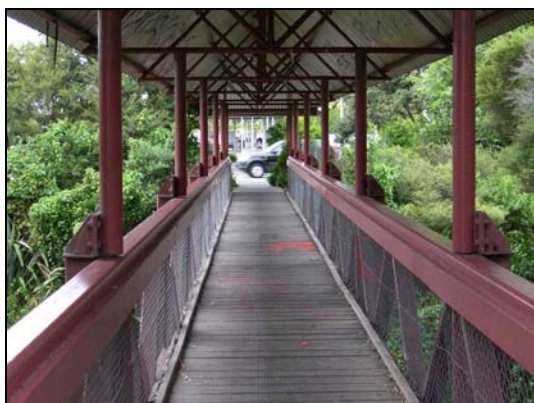
The reserve is extensively vegetated. The canopy consists of mainly native tree species whereas the understorey consists of predominantly exotic weeds (refer to **Appendix A** for list of exotic and native species found on the reserves of the Lower Oratia Stream). There is a small amount of debris in the stream, and also on the stream banks. There appears to be good stability to this embankment, possibly due to the understorey planting.



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Vitasovich Esplanade Reserve:

Vitasovich Esplanade Reserve lies along the eastern embankment of the Lower Oratia Stream. The stream forms the western boundary, and Vitasovich Avenue the eastern boundary. It extends from just past Edsel Street for approximately 280 metres, and is 0.6009 hectares in area.



Vitasovich Esplanade Reserve viewed from Catherine Esplanade Reserve.

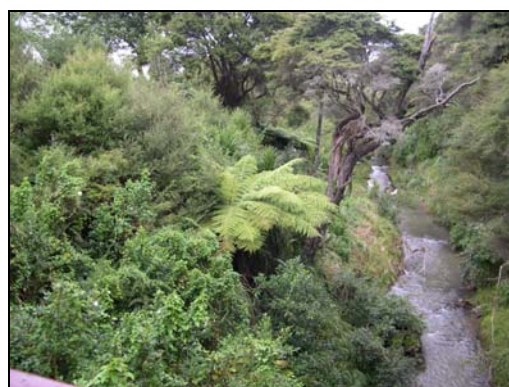
There is a historic tree, scheduled in the Operative District Plan, which lies in the smaller section of reserve that is intersected by Edsel Street. The tree is an Australian Blackwood (*Acacia melanoxylon*).

There is a pathway running along side of Vitasovich Avenue in front of the street tree planting. This walkway is part of an established pedestrian network from Hart Reserve to the main shopping area. The bridge from Catherine Esplanade crosses this reserve and connects to Vitasovich Avenue footpath, providing a good linkage from Henderson town centre to a major shopping complex. The proximity of local services and the use of the reserve as a pedestrian corridor explain the high levels of activity. A sign at the entrance to this bridge identifies the stream. There is also a bus shelter located approximately 18 m from the bridge.

There is dense weed growth throughout this reserve (apart from the northern corner cut off by Edsel Street).

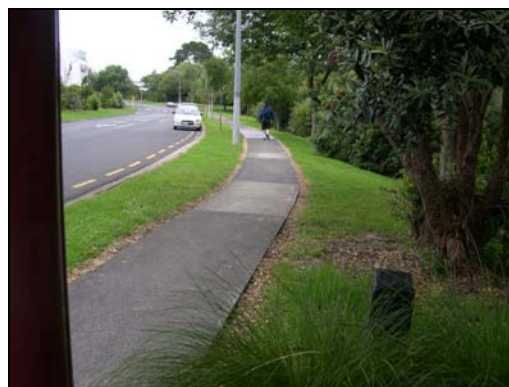
This is possibly due to the tree cover not being as thick as on Catherine Esplanade. This weed growth again was mainly understorey (refer to **Appendix A** for list of exotic and native species).

There was some native understorey planting visible with a buffer of Manuka (*Leptospermum scoparium*) along Vitasovich Road, effectively separating the embankment planting from streetscape planting. Claret Ash (*Fraxinus raywoodii*) street trees have been planted in the road reserve of Vitasovich Avenue.



Vitasovich Esplanade Reserve looking over Lower Oratia Stream

There was some erosion evident on the lower embankment slopes of this reserve, along with some debris in the stream. However, minimal rubbish was evident in within the rest of the reserve.



Vitasovich Esplanade Reserve looking down Vitasovich Avenue



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MAP 1: LOCATION PLAN

source: wises st directory

 - study area







Hart Domain looking towards playground.

Hart Domain:

Hart Domain lies directly south of the Waitakere Plaza shopping centre, and is a triangular reserve, 1.7259 hectares in size. Vitasovich Avenue extends through this reserve, dividing it in two, so that only a small 'esplanade' of this reserve is in direct connection with the stream. The vegetation along the embankment of this esplanade is relatively dense forming a solid wall preventing a direct view of the stream, apart from at a bridge crossing and below a mature Monterey Pine tree (*Pinus radiata*). The bridge is located to provide a pedestrian connection from Hart Domain across to Cranwell Street and Railside Avenue, which contains commercial and industrial businesses and provides access to Henderson Railway Station.

In 1996 work was completed in the reserves, including a pedestrian path network and children's playground. This playground is extensive, and is located directly behind the shopping centre. Near the playground are seating and bins, with a sign introducing the park to passers-by.

There is also a public sculpture called the 'Taniwha of a Thousand Hands', which included input from the local community in its construction and is utilised as part of educational play.

Further down Hart Domain, on the section of reserve that is connected with the Lower Oratia Stream, is another sculpture built by local artist Stuart Slater, with input from the local community. This sculpture was built out of discarded shopping trolleys recovered from the Oratia Stream as part of Waitakere City's Clean Stream Programme.



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The aim of this artwork was to highlight 'the benefits of recycling and reusing materials, while at the same time celebrating a slice of local history' (source: Waitakere City Council website 2004).

The reserve has a pedestrian connection to the nearby commercial centre. This reserve has the largest open space area (currently used for informal play) of the reserves adjoining the Lower Oratia Stream. The opportunity to expand upon current recreational uses in this reserve exists, particularly the inclusion of features that community have suggested such as a skateboard ramp.

There is a large amount of weed growth in the embankment of Hart Domain, with many exotic trees (refer to **Appendix A**). There are flax (*Phormium tenax*) and cabbage trees (*Cordyline australis*) planted in the main part of Hart Domain, but the main shade tree, a Claret Ash (*Fraxinus raywoodii*) is typical of street tree planting in that locality.

Railside Esplanade Reserve:

Railside Esplanade Reserve is a small reserve, 0.0783 hectares in size, located approximately 150 metres from View Road.

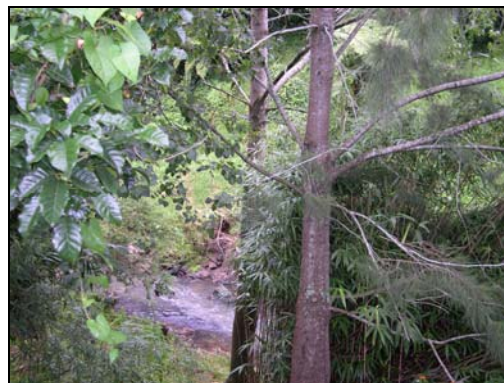
The reserve is not accessible to the public as it is located directly behind privately owned property.

It is heavily vegetated with dense weed growth, with a dense canopy of willow, pine trees and bamboo (refer to **Appendix A**).

The embankment appeared to be quite steep in this location, which could cause stability issues, even though the embankments themselves are heavily planted.

Whilst public access to this reserve is limited, there is an opportunity to utilise this reserve through the placement of a public artwork/ feature, as suggested by

the community through the consultation process. It would be possible to view this artwork from the opposite Millbrook Road embankment, providing a visual focus for the public utilising these reserves.



Railside Esplanade Reserve as viewed from Millbrook Road.

Millbrook Road Reserve:



Millbrook Road Reserve as seen from Millbrook Road.

Millbrook Road Reserve is a small, linear reserve, being on average less than 20 metres wide and 100 metres long. A pathway is located along the road edge, with the reserve grassed to the top of the embankment. This path allows for clear sightlines, which is important as this reserve is located beside a busy local road.

There is a lot of dense vegetation of predominantly exotic trees on the stream embankment, with Crack Willow (*Salix sp.*), Poplar (*Populus sp.*), Tree Privet



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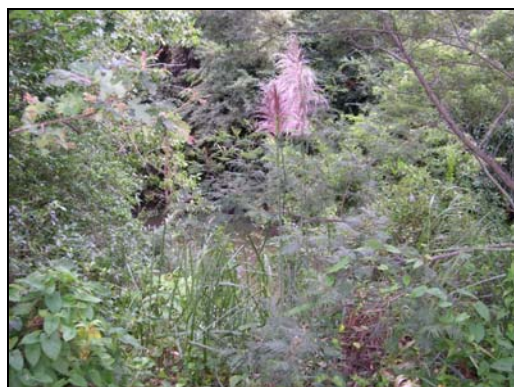
(*Ligustrum lucidum*), Liquidambar (*Liquidambar styraciflua*), Oak (*Quercus robusta*) and Pines (*Pinus radiata*) the predominant tree species (refer to **Appendix A**).

Very little native planting was evident here, apart from a few pioneer species such as Manuka (*Leptospermum scoparium*). The stream embankments were fully vegetated.

Serwayne Place Reserve, incorporating Millbrook Esplanade Reserve:

For the purpose of this document the name Serwayne Place Reserve will be used as a working title.

The proposed Serwayne Place Reserve is located between housing facing Millbrook Road and Serwayne Place. It combines Serwayne Walk Reserve with Millbrook Esplanade Reserve creating an extensive amount of open space (1.396 hectares). Currently there is limited public usage of this reserve.



Serwayne Place Reserve overlooking the Lower Oratia Stream

A small car park is located just above the Sunnyvale Station in Serwayne Walk. The car park was full, with overflow parking, when the site was visited, indicating a utilisation of the rail service. An easy and direct pedestrian link was one of the suggestions made by the public submissions, which could be incorporated

at this point, as currently it appears to be the easiest connection to the platform.

Serwayne Walk reserve consists of existing open-grassed areas, and areas heavily vegetated in weed species (refer to **Appendix A**), with a small amount of native vegetation.



Sunnyvale Railway Station

Safety issues should be considered in the layout of planting beside the path network.

There is a Concept Plan prepared for Serwayne Walk as part of the Twin Streams project. This includes the purchase of properties in order to improve stormwater management, the restoration /revegetation of the stream and provision of cycle and walkways connecting adjacent reserves and open space. Refer to **Appendix B**.



Millbrook Road Reserve overlooking the Lower Oratia Stream



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Seymour Road Triangle and Proposed Esplanade Reserve:

For the purpose of this document the name Seymour Road Triangle will be used as a working title.

Part of the Seymour Road Triangle (approximately 2.1 hectares) is being purchased for stormwater management under the Twin Streams project. This is the proposed Esplanade Reserve. It will become a Local Purpose (esplanade) reserve, with a strong stormwater management focus.

It is also proposed to include a Park and Ride commuter car park above the proposed Esplanade Reserve in response to community suggestions. This Management Plan will discuss the future management in anticipation of it becoming a reserve.

This land is relatively open, compared to the previous reserves, with a gentler embankment slope leading to the stream. Vegetation in this reserve included flax (*Phormium tenax*), cabbage trees (*Cordyline australis*), manuka (*Leptospermum scoparium*) and mamaku (*Cyathea medullaris*), although there were large swathes of pampas grass and evidence of weed growth closer to the stream (refer to **Appendix A**).

Oratia Esplanade Reserve:



Oratia Esplanade Reserve – Southern End looking towards open grassed area.

The Oratia Esplanade Reserve is comprised of an existing reserve along with proposed additional properties that lie on approximately both sides of the Lower Oratia Stream from Serwayne Walk Reserve until the southern extent of this reach. It is by far the largest single reserve along the stream, being 3,6062 hectares in size (excluding the future additions).

The reserve is located behind established and newly created residential estates, and could provide the opportunity for a cycle walkway network being incorporated to serve these neighbourhoods. Currently there is no developed access to these reserves.

The majority of community submissions expressed an interest in providing a walkway along the Lower Oratia Stream. The inclusion of a streamside walk along with access to the stream by viewing platforms would work well along this section of reserve.

The southern end of the reserve contains open space and could accommodate facilities such as a fitness trail, which has been suggested in public submissions, although the western side of the reserve adjoining Legacy Drive contains a stormwater detention basin.

The embankments in this reserve are heavily vegetated and infested with exotic weed species (refer to **Appendix A**).



Oratia Esplanade Reserve – Northern End, as viewed from the future Esplanade Reserve





Oratia Esplanade Reserve - Mid Section, overlooking the Lower Oratia Stream



Oratia Esplanade Reserve – Southern End, looking towards the Lower Oratia Stream

1.5 Purpose of the Reserve Management Plan

The purpose of this Reserve Management Plan is to provide ecological and recreational opportunities for the local and wider community in a manner that is in keeping with the existing character of the reserves. The Plan sets out the management objectives and policies intended to achieve this purpose. The Plan has been produced within the context of Waitakere City's wider objectives.

The objectives of this Management Plan are:

- To provide passive and active recreational opportunities that incorporate an appreciation of the streamside character, including direct pedestrian and cycle access to surrounding community use activities.

- To protect and enhance the natural ecosystems of these reserves, especially the streams and their margins.
- To recognise, protect and convey where appropriate, the Maori cultural and historical values of the Lower Oratia Reserves.
- To recognise, protect and promote, where appropriate, European cultural history.
- To improve the water quality of the Lower Oratia Stream.
- Protect the natural character of the Lower Oratia Stream for the benefit and enjoyment of the public.
- Retain the natural character of the landscape throughout the entire chain of reserves.
- Provide safe and user-friendly access and connections to and from activity nodes that occur along the Lower Oratia Stream. Retain the natural character of these reserves in the implementation of circulation routes and parking areas.
- To ensure the reserves are managed in terms of their reserve classifications for the enjoyment and use of the local and regional community, now and in the future.

1.6 Management Plan Process

The process that was followed in the production of this Management Plan was in accordance with the Reserves Act 1977 and included public consultation. This process has been outlined in Table 1:



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TABLE 1 – MANAGEMENT PLAN PROCESS

ACTION	DATE
Public notification of intention to prepare Management Plan	September 2003
Background research and initial discussions and contact with interest groups	September - October 2003
Public workshop on Management Plan issues and suggestions	October – November 2003
Issues identified and evaluated and included in draft Plan	
Preliminary submissions close	November 2003
Detailed consultation and planning with interest groups and drafting of Management Plan. A delay in the process eventuated due to the incorporation of the cycle and walkway network into the Twin Streams project, and subsequently this Management Plan	November 2003 – July 2005
Draft Plan prepared and presented to Council for approval to notify	July 2005
Draft Plan publicly notified for submissions	July 2005
Submission period on draft Reserve Management Plan closes	September 2005
Hearing of submissions on draft Plan and decisions on submissions, adoption of final Management Plan on behalf of Council	November 2005
Modification of Plan according to decisions	December 2005 – February 2006
Plan kept under continual review by Waitakere City Council	Ongoing

Over 500 people were consulted face to face and over 30 written submissions were received. Feedback on the Lower Oratia Stream Reserves Management Plan and proposed cycle and walkways was overwhelmingly positive, with residents viewing them as a community asset which would enhance their local area and the City. A copy of the WCC report presenting public feedback from the two month consultation project is included in **Appendix C**.

2.0 STATUTORY REQUIREMENTS

Reserves Act 1977

This Act provides the current legislation for the management of reserves throughout New Zealand. The Act shall be administered for the purpose of:

‘Providing, for the preservation and management for the benefit and enjoyment of the public, areas of New Zealand possessing –

- (i) Recreational use or potential, whether active or passive; or*
- (ii) Wildlife; or*
- (iii) Indigenous flora or fauna; or*



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- (iv) *Environmental and landscape amenity or interest; or*
- (v) *Natural, scenic, historic, cultural, archaeological, biological, geological, scientific, educational, community, or other special features of value;*

'Ensuring, as far as possible, the survival of all indigenous species of flora and fauna, both rare and commonplace, in their natural communities and habitats, and the preservation of representative samples of all classes of natural ecosystems and landscape which in the aggregate originally gave New Zealand its own recognisable character;'

'Ensuring, as far as possible, the preservation of access for the public to and along the riverbanks, and fostering and promoting the preservation of the natural character of the margins of lakes and rivers and the protection of them from unnecessary subdivision and development.' (Source: Reserves Act 1977 Part 1, s3(1) <http://www.legislation.govt.nz>).

The Reserves Act requires that every reserve for which there is an administering body, must be covered by an approved Management Plan, except for Local Purpose reserves. This Management Plan is subject to continuous review.

The majority of reserves in this plan are classified as Local Purpose (esplanade) reserves under the Reserves Act 1977, with a few lots being Recreation Reserve.

Resource Management Act 1991

The purpose of the Act is to 'promote the sustainable management of natural and physical resources'. By sustainable management the RMA means 'managing the use, development, and protection of natural and physical resources in a way that enables people and their communities to provide for their social, economic, cultural wellbeing, health and safety whilst, safeguarding the life supporting capacity of air, water, soil and ecosystems.'

The Act requires Management Plans to consider the following 'matters of national importance':

(a) *'The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development,*

(b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development,*

(c) *The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna.*

(d) *The maintenance and enhancement of public access to and along the coastal marine area, lakes and*

(e) *The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga.'* (Source: Resource Management Act 1991 Part 2 s6).

Waitakere City Council Operative District Plan

Waitakere City's Operative District Plan classifies the reserves along the Lower Oratia Stream as Open Space under Human Environments and Ecological Linkage Opportunities under Natural Areas.

The Operative Plan has identified the Lower Oratia Reserves as ID No.: 25 – Henderson, with the following description:

'Mostly riparian esplanade reserve and Waitakere City Council land, including parks and Housing Corporation land.....Mostly ecological linkage, with some restoration areas fronting the coastal edge.' (Source: Waitakere City Council Operative District Plan).



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Ecological linkages are seen as a means of establishing 'ecological corridors which link areas of significant native vegetation and fauna habitat to other remnant areas. These linkages facilitate the natural movements of native plants and animals between areas, and of seed dispersal' (Source: Waitakere City Council Operative District Plan).

Riparian margins defined under this heading vary between 5 and 20m. Apart from a historic tree listed in Vitasovich Reserve (**Listed Tree 79: Australian Blackwood – *Acacia melanoxylon*, corner of Edsel Street and Vitasovich Avenue, near Oratia Stream**), there are no items listed for protection under the Operative Plan.

In addressing Open Space management, the Operative Plan focuses on managing the impacts on the reserves themselves. The Reserve Management Plan allows for the detailed management of the placement of buildings, paths and active play areas in relation to the specific qualities of any park.

The Operative Plan also states that Management Plans should also include active programmes of restoration of bush, provision of recreation facilities, and general design issues.

Auckland Regional Policy Statement

The Auckland Regional Policy Statement describes esplanade reserves, esplanade strips and access strips as 'mechanisms, which may be used to facilitate the sustainable management of the margins of lakes, rivers and the sea'.

Esplanades form an important link between the land and water, and should be managed as such. A major objective of the Policy Statement is to encourage the establishment of continuous linkages along the margins of lakes, rivers and the sea.

3.0 RESERVE INDEX AND MAPS

The table on the following pages provides details of the reserves, their legal descriptions and their Reserves Act classification.



Part 1

TABLE 2 – RESERVE CLASSIFICATIONS

Reserve	Legal Description	Certificate of Title	Area (Ha)	Reserve Classification
Oratia Esplanade	Lot 15 DP 73596	N/A	0.4111	Local Purpose (Esplanade)
	Lot 11 DP 74032	N/A	0.586	Local Purpose (Esplanade)
	Lot 39 DP 76748	N/A	0.275	Local Purpose (Esplanade)
	Lot 48 DP 79192	N/A	0.1427	Local Purpose (Esplanade)
	Lot 49 DP 79192	N/A	0.1334	Local Purpose (Esplanade)
	Lot 47 DP 81475	N/A	0.1425	Recreation
				Local Purpose (Pedestrian and Tractor Access)
	Lot 21 DP 98568	N/A	0.0182	
	Lot 3 DP 119652	N/A	0.0108	Local Purpose (Esplanade)
	Lot 48 DP 114206	N/A	0.1249	Local Purpose (Esplanade)
	Lot 3 DP 126743	N/A	0.3467	Local Purpose (Esplanade)
	Lot 51 DP 125569	N/A	0.3004	Local Purpose (Esplanade)
	Lot 52 DP 125569	N/A	0.1932	Recreation
				No reserve status (status is 'accessway')
	Lot 53 DP 125568	N/A	0.0133	
	Lot 64 DP 102695	NA56A/846	0.908	Local Purpose (Esplanade)
	Total:		3.6062	
Serwayne Walk	Lot 8 DP 44046	NZG 1957 p512	0.4553	Local Purpose (Esplanade)
	Lot 36 DP 79294	N/A	0.135	Local Purpose (Esplanade)
	Lot 34 DP 79295	N/A	0.3045	Local Purpose (Esplanade)
	Lot 41 DP 79296	N/A	0.5012	Local Purpose (Esplanade)
	Total:		1.396	



Part 1

TABLE 2 – RESERVE CLASSIFICATIONS

Reserve	Legal Description	Certificate of Title	Area (Ha)	Reserve Classification
Millbrook Esplanade	Lot 21 DP 37485	N/A	0.0936	Local Purpose (Esplanade)
	Lot 3 DP 58176	N/A	0.0321	Local Purpose (Esplanade)
	Lot 4 DP 63877	N/A	0.0215	Local Purpose (Esplanade)
	Lot 4 DP 85886	N/A	0.023	Recreation
	Lot 2 DP 135368	N/A	0.0373	Local Purpose (Esplanade)
	Total:		0.2075	
Millbrook Road Reserve	Part DP 5174 being more particularly described as Part Lot 33 Allotment 90 Parrish of Waikomiti	NA213/5		No reserve status (status is 'freehold land')
Railside Road Reserve	Lot 3 DP 202690 Parcel ID 167846	NA131C/80	0.0783	Local Purpose (Esplanade)
Hart Domain	Lot 1 DP 24405 being more particularly defined as Lots 1 and 3 on LT 131829	NA371/163	Lot 1= 0.6936; Lot 3=0.9677	Recreation
	Part Lot 5 DP 17318 being more particularly defined as Lot 4 LT 131829	NA862/75	0.0646	No reserve status (status is 'freehold land')
	Total:		1.7259	
Catherine Esplanade Reserve	Lot 2 DP 100310	N/A	0.0305	Local Purpose (Esplanade)
	Lot 2 DP 165913	100B/713	0.2256	Local Purpose (Esplanade)
	Lot 3 DP 165913	N/A	0.05	No reserve status (status is 'stream bed')
	Lot 5 DP 91905	N/A	0.182	Local Purpose (Esplanade)
	Total:		0.4881	



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TABLE 2 – RESERVE CLASSIFICATIONS

Reserve	Legal Description	Certificate of Title	Area (Ha)	Reserve Classification
Vitasovich Esplanade	Lot 2 DP 91654	N/A	0.176	Local Purpose (Esplanade)
	Lot 5 DP 130645	N/A	0.3049	Local Purpose (Esplanade)
	Lot 1 DP 91701	N/A	0.054	Local Purpose (Esplanade)
	Lot 3 DP 91701	N/A	0.066	Local Purpose (Esplanade)
	Total:		0.6009	

Note: This table only refers to existing Reserves, not to land currently being purchased under Project Twin Streams.



4.0 STRATEGIC CONTEXT

Reserve management sits within the context of Council's strategic direction, some of which is outlined within the following documents.

Greenprint

The Greenprint's aim is to provide a strategic means of making Waitakere a more sustainable City, according to the principles of Agenda 21. It has identified key target areas that it believes are important to address in order for an Eco-City to evolve. These key targets are: Communities, City Form and Design, Transport and Communication, Economic Development, Taonga, City Well-being, Energy, Resources and Waste. When referring to the environment, the Greenprint's aim is described as:

- Providing for public benefit;
- Promoting stewardship of resources for current and future generations;
- Recognising and taking pride in the natural environment special to Waitakere City; and
- Recognising the sacredness of the world and responsibilities to all living things.

Green Network

The Green Network aims to create a network of green space, linking existing open space, streams and bush remnants into an ecologically continuous, vegetated, green network extending from the ranges, along the stream and road networks and across open spaces to the sea. Within this corridor, which includes both private and public land, the full natural progression of coastal to mountain vegetation, habitats and processes is able to take place.

The Green Network will be used:

- To protect significant natural vegetation and wildlife habitats;
- To develop ecological corridors which will allow for the movement of wildlife and the slow migration of plants;
- To protect significant landforms;
- To protect water quality in streams and waterways bordered by the network;
- To make the City a more attractive place visually;
- Potentially to service households and business needs;
- As a flood protection tool;
- To provide public access to and along the coast, streams, lakes and other waterways;
- To help integrate the City's natural and urban environments; and
- To help create a new City form separated by the Green Network but also linked by means of cycle and walkways.

The Lower Oratia Stream reserves offer the opportunity to provide a link from the foothills of the Waitakere Ranges to Henderson Creek, which connects to the Waitemata Harbour.

Parks Strategy

The Parks Strategy has been developed in accordance with Waitakere City's Greenprint document, and provides guidelines for the sustainable management of parks within the City. The Parks Strategy has two important functions. The first is providing a vision for how parks within Waitakere City should look, and the second is setting out the key steps to enable this vision to become a reality.



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Outlined in this document are ten objectives for park management. These objectives are:

1. Increase the use and enjoyment of parks.
2. Extend and improve the City's natural ecosystems.
3. Increase the opportunities for people to enjoy nature in parks.
4. Manage parks sustainably as part of the wider landscape.
5. Improve the use, range and quality of sports facilities within the City.
6. Protect the heritage values within parks, and increase the awareness of the local area's heritage.
7. To provide quality local and neighbourhood parks that are within walking distance throughout the City.
8. To provide in partnership with Iwi, and where relevant the wider Maori community, the protection of waahi tapu and sites of significance found on parks.
9. Involve communities in the design and management of parks.
10. To improve the management and administration of parks.

The majority of the Lower Oratia Stream reserves are classified as esplanade reserves. The Parks Strategy, in accordance with the Reserves Act 1977, defines esplanade reserves as 'parks that are usually no wider than 20m, alongside the coast, rivers, streams and lakes'. These reserves should 'provide continuous linkages around the coast and along the margins of rivers, lakes and streams'.

The Parks Strategy divides parks into three types:

- City-wide Parks – are large individual parks, or groups of parks that combine to provide significant areas of native ecosystems, and a variety of landscapes and recreation opportunities;

- Local Parks – are medium sized parks of between 1 – 3 hectares that usually contain one or two sports fields areas for casual recreation, landscape planting and native ecosystems; and
- Neighbourhood Parks – are small areas of open space between 1000 – 4000m² within neighbourhoods that have some landscaping and provide areas for play.

Under the Parks Strategy the reserves of the Lower Oratia Stream are listed as Local Parks, with Hart Domain defined as a Neighbourhood Park. All of the Lower Oratia Stream reserves are part of the Green Network.

Weed Strategy

The objective of the Waitakere City Council Weed Strategy is for the 'protection of the quality, resilience, biodiversity and ecological integrity of Waitakere City's natural habitat from the impacts of environmental weeds'. The Strategy describes the approach to be taken by Council in removing environmental weeds in regard to identifying, prioritising and managing weed impacts.

There are a number of other publications by Waitakere City Council dealing with weed eradication, with one in particular looking at the Oratia Catchment (**refer to Oratia Catchment Planting Guidelines in Appendix D**).

Leisure Strategy

This document outlines the Council's goals for improving leisure opportunities in Waitakere. These goals include promoting:

- The enjoyment of life and leisure time that comes from taking part in fun activities that build self-confidence, skills, physical health or fitness;



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- Opportunities for outdoor recreation in their abundant green settings; and
- A sense of belonging, community, and City identity.

The Leisure Strategy offers guidelines to achieve these goals. These guidelines include:

- Diversity of leisure services to focus and improve provision for different groups and communities;
- Improve natural amenity by building on the unique 'green' and 'blue' images of Waitakere City; and
- Develop community focal points near where people live and shop, with an atmosphere of enjoyment and availability of low-cost casual leisure activities.

Te Kawerau A Maki Trust Resource Management Statement

This is a Resource Management Statement that outlines the concerns and goals of the Kawerau a Maki Trust with regard to the sustainable management of the Taonga within the tribal area of Te Kawerau a Maki. Fundamentally, the issues regarding sustainable management addressed in this statement focus on achieving a balance between:

- The maintenance of spiritual and cultural values;
- Environmental and heritage protection and enhancement; and
- Social and economic development.

Ngati Whatua

Ngatai Whatua maintains and exercises kaitiakitanga over the resources of the Waitakere region, in part through a relationship with Council.

Ngati Whatua customary rights are based on continuous occupation, access and use of the district's resources. Inherent in the Maori resource management principle – kaitiakitanga, is the concept of reciprocity. Tangata Whenua are therefore obligated to protect and enhance the natural resources we harvest or utilise.

Many of these resources have dramatically declined, especially since the advent of colonial settlement, associated population increases, urban development and industrialisation. Litter, pollutants and increased flows not only impact on the stream itself but also has long and short term effects for downstream receiving environments such as Te Huruhuru (Henderson Creek) and the Waitematā.

Ngati Whatua heritage and resource management principles seek:

- To protect and enhance or restore the mauri of the Oratia Stream;
- To maintain and restore customary practices and traditions associated with the Oratia Stream, i.e. mahinga kai (food sourcing), rongoa (medicines), mahi toi (arts material) and waka passage;
- To protect, restore and enhance local, native biodiversity;
- To affirm, protect and promote the history and heritage values of the stream, the catchment and associated tributaries; and
- To affirm and protect significant heritage sites within the Oratia Stream catchment.

Project Twin Streams

Project Twin Streams comes out of a vision for Waitakere City as a true Eco-City where the streams form a green network linking the city together from the Waitakere Ranges to the Waitemata Harbour. This is a unique, project not only because of its scale, but also because of the support for the project from all levels of the community.



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Project Twin Streams is integral to the sustainable development approach Waitakere City Council seeks to implement throughout Waitakere City.

The project seeks to address the negative impacts associated with urban sprawl around the Oratia, Opanuku and Swanson Streams, and aims to involve the local community in addressing these impacts. In particular, the project provides for improved stormwater quality, ecosystem rehabilitation, and flood mitigation. Waitakere City Council has involved the community from the start, with the production of newsletters and the implementation of educational signage, and has gained wide-spread regional and local support for the work. Refer to **Appendix B** for the Twin Streams Landscape Plan.



Twin Streams planting day



Members of the local community helping out on one of the Twin Streams planting days

5.0 MANAGEMENT PLAN OBJECTIVES

5.1 An Integrated Vision for the Reserves

The management of the reserves along the Lower Oratia Stream incorporates objectives that include the sustainable management of resources, the protection of environments, the strategic aims of the local Council, as well as incorporating local community expectations. It therefore aims to be strategic on a broad level, and to be specific to each reserve's particular environmental, historical or cultural qualities.

There are nine existing reserves adjoining the Lower Oratia Stream (not including private land to be purchased as future reserves) that could be seen as a chain of ecological linkages of open space, connecting the community to their local and natural environment. The nine reserves and future reserves should be treated as a whole, but with due consideration to the unique qualities that each site possesses.

5.2 Approach to Preparing Policies

An integrative and holistic approach was taken in the preparation of the policies in this Reserve Management Plan.

In formulating the policies, the following background material was gathered and analysed:

- Community expectations
- Condition of the reserves
- Condition of the Oratia Stream
- History of the stream and surrounding land.



This information has been utilised along with the strategic context and statutory requirements in forming the aims and objectives of the policies for this Management Plan. Where there are cases of specific reserve requirements, these have been addressed in the Concept Plans and Design Guidelines.

5.3 Community Expectations for the Reserves

As part of the process of preparing a Reserve Management Plan, a submission period allows for members of the public to comment on issues relating to the reserves. In preparing this Management Plan, the local community from the area immediately surrounding the Lower Oratia Stream were consulted. This occurred at organised events, including planting days over the period of approximately three months from September until the end of November 2003. Over this period 94 submissions were made (**refer to Appendix C**), 40 of which were made by adults and 54 by youth.

Of these submissions, a majority considered a walkway of some sort important, with more planting and cleaning up the stream also identified as important requirements. Adding bridges across the stream at strategic locations, such as linking Serwayne Place to Millbrook Rd and Serwayne Place to Sunnyside Road, were also suggested, along with a bridge across the railway line from the road, to create a shortcut to the station. Picnic areas and BBQs were also high on the list of what the community would like to see in the reserves. Recreational activities suggested by the community included fitness trails, playgrounds, bike trail, skateboard ramp/ park, flying fox, fun park, kayaking/ canoeing, dog walking and go-carting.

6.0 RESERVE VALUE DESCRIPTIONS

6.1 The Natural Environment

Soils

The geology of the surrounding catchment comprises a combination of sedimentary rocks of the Waitemata Group, and alluvial silt, clay and peat soils of the Tauranga Group. Soils are moderately to highly erosion prone, with a poor to moderate soakage capacity.

The catchment area of the Lower Oratia Stream lies in gentle topography, although the actual stream banks themselves are considered moderate to steeply sloped. There is some evidence of embankment slippage and scouring issues. Localised bank failures are evident in a number of areas along the stream, which has lead to reconsolidated slip material occurring, creating a narrow floodplain (2001 Kingett Mitchell and Associates).

Vegetation

Vegetation along the stream comprises of a mixture of native and exotic. Of the native, mahoe (*Melicytus ramiflorus*), kanuka (*Kunzea ericoides*), mapou (*Mysine australis*), kowhai (*Sophora microphylla*), karamu (*Coprosma lucida*) and ponga (*Cyathea dealbata*) are most evident.

Exotic weeds are dominant in many sections of the stream. A list of exotic plant species found growing along the Lower Oratia Stream is available in **Appendix A**.

Rough grass and weeds occur between the native and exotic shrubs with some stands of trees comprising a mixture of native and exotic species.



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Local patches of stream bank have been cleared of their weeds and revegetated with suitable native species, with groups of flax established in stretches upstream of Great North Road (2001 Kingett Mitchell and Associates). Revegetation has also occurred along Vitasovich and Catherine Reserves at some stage as there are mature manuka trees along with a wide variety of native species at the mid-canopy level. Along Hart Domain and Millbrook Road, just past View Road, some recent revegetation has occurred with kowhai (*Sophora microphylla*) planted along the top of the stream embankment. Kowhai (*Sophora microphylla*) also occur around Serwayne Place and Oratia Esplanade and are to be itemised in the District Plan.

Stream Quality

The ecological values of Lower Oratia Stream are relatively poor. However, this stream is considered an important passage for native fish and other aquatic life (2001 Kingett Mitchell and Associates).

Habitat characteristics were assessed according to the Urban Stream Habitat Assessment (USHA) process. This assessment evaluates the physical habitat of urban streams (1998: NIWA). According to this assessment the habitat characteristics and water quality, whilst ecologically it is seen as relatively poor, when compared to other Waitakere City streams the stream is considered moderate.

Landscape

The landscape of the Lower Oratia Stream catchment includes rural land and an increasing level of urban development. The topography of the area includes rolling hills with gentle to steep sloping embankments. However, the esplanade reserves adjoining the stream are on low-lying land and flood prone in some areas.

Fauna

The amount of terrestrial fauna observed in biodiversity monitoring programme studies that include the Lower Oratia Reserves show that numbers are in decline. This has been explained as due to 'small and isolated habitat fragments, generally in areas of most intense urbanisation' such as Catherine Esplanade (Envirologic 2003).

It is suggested by the different ecological studies, that a 'proactive, comprehensive and integrated ecosystem approach is required to enhance the survival and resilience of the City's biodiversity' (Envirologic 2003).

Recent fish surveys indicate that numbers are similar to previous records. Riparian planting that links the forested headwaters to the sea is considered as the best means of increasing habitat quality and fish numbers.

6.2 Recreational Uses throughout the Lower Oratia Reserves

The reserves along the Lower Oratia Stream allow for a number of informal active and passive recreational uses, being utilised mainly by the local community.

Passive activities include walking to the major shopping centres of Henderson, dog walking and cycling along the existing path network. The main active recreational opportunity in these reserves is the playground in Hart Domain.

Project Twin Streams community planting days have provided further activity opportunities, which also provide access to the stream. This planting has taken place beside the bridge near View Road and near Seymour Road.



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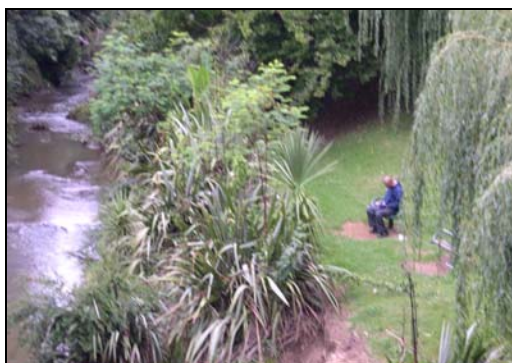
Artworks which have had community input can be viewed in some of these reserves, such as the Taniwha sculpture in the playground of Hart Domain, and the Bullock Sculpture also in Hart Domain.

There are also numerous open and secluded places along the reserves, where people sit and enjoy the surroundings. Footbridge crossings between Vitasovich Esplanade, Catherine Esplanade and Hart Domain allow for views and provide a visual connection to the Stream.

Historically, boating and swimming were activities that occurred along the Lower Oratia Stream. Currently these activities are reduced, especially as there is no direct public access to the stream.

Currently, access to the Lower Oratia Stream reserves is limited to pedestrian links, apart from the northern extent, which is located near Henderson town centre and nearby car parking.

Overall, the ecology and the heritage of the stream are important characteristics that contribute to the experience of the reserves. Highlighting these two elements through signage or artwork would further enhance the experience that the reserves of the Lower Oratia Stream have to offer.



Seating to allow for views of the Lower Oratia Stream



Privately built viewing access that overlooks the Lower Oratia Stream



Twin Streams community planting day



Twin Streams community planting day: Chris Ferkins planting demonstration



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Twin Streams community planting day:
Rutherford School planting



Twin Streams community planting day: Joseph
and Tai

6.3 Cultural Heritage and History

Maori Heritage and the 'Tangata Whenua' or 'People of the Land':

To understand the issues relating to waahi tapu it is essential to gain a brief understanding of the Maori history of this area.

The tangata whenua of the Waitakere area are an Iwi or tribal group known as Te Kawerau a Maki. They are still recognised as the traditional owners of this land in Maori terms, or holding mana whenua even though they are no longer in permanent occupation of this domain.

Te Kawerau a Maki 'have been a distinct tribal entity since the early 1600's when

their ancestor Maki and his people conquered and settled the district' (Garriock et al 1991:9). Through prior ancestral links, and subsequent intermarriage with those they conquered, they have genealogical links extending back to all of the preceding tribal groups that occupied the Waitakere area.

The first inhabitants of this region were known as the Turehu (the people of the Earth). The Kawerau Rangatira (chieftain) from Waitakere, Te Waatarauhi Tawhia, described this land in 1860 as "the talk of old tells us that this land is a fish, the man who fished it up was Maui" ("Ki ta korero i mua he ika tenei whenua: ko te tangata nana i huti ka Maui"). From the Turehu, several place names have remained.

The Kawerau iwi also descend from another tribal group who migrated into the Auckland Isthmus, known as the 'Tamaki makaurau' area. Originally from the Taranaki coastline, the Kawerau migrated north with some of them settling in the Waitakere Ranges, where they conquered and absorbed the Turehu.

Another Iwi Group, the Ngati Whatua conquered the Tamaki isthmus in the 1740's. Due to important marriages between the Ngati Whatua and Te Kawerau, the latter group were left in peace in the Waitakere Ranges and West Auckland. The Ngati Whatua gradually encroached into Te Kawerau territory and had virtually taken over by 1840.

Settlement appears to have been confined almost totally to the west coast area, rather than on the eastern slopes or the high central portion of the Waitakere Ranges. However the entire Waitakere Ranges area was used for harvesting food resources and to visit sacred places. Many important walking tracks that were created and used by the Maori are still evident today.

There are many archaeological sites found in the Waitakere area, including eighteen pa or fortification sites, at least ten kainga



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(village sites) and numerous maara (cultivations). There are also sites of cultural significance related to food gathering places, walkways, canoe landing areas and sacred places. These sacred places include rocks, trees, places of ritual or battle sites and places associated with specific cultural ancestors or events.

Of the Oratia Stream itself, it appears that there were three inland middens, which when radiocarbon dated, were shown to have been deposited there about 1570 (Diamond et al. in Northcote-Bade 1990:33-41). Refer to **Appendix E** for maps locating these middens.

European Heritage and Sites of Significance:

West Auckland European occupation began in the 1830's when pitsawyers first began cutting kauri along the Manakau Harbour foreshore. It wasn't until the early 1840's that isolated pitsawing stations established themselves in the Oratia Valley. Thomas Canty set up a pitsawing station on the Oratia Stream around 1845. This was followed closely by Henderson's Mill in the mid 1840's, from which a township developed, its name being shortened eventually to Henderson. Many of the small creeks were dammed to float logs down to the mills, while others had dams or booms at the mouth to hold the logs for the mills. As a tributary of Henderson Creek, winding through Henderson, it is highly likely that the Lower Oratia Stream was used in such a way. Often these dams were gradually filled with logs over the period of a about a year. In the 1850's and 1860's, dams were used to drive kauri logs down the Henderson and Swanson streams to the upper reaches of the Waitemata Harbour. Dams were built on streams draining the western Waitakere Ranges from 1867 to the 1920's.

It is quite possible that Millbrook Road was named after the function of the Lower Oratia Stream beside it.

Henderson's Mill, and later Henderson, was named after Thomas Henderson, who set up the Mill in 1847, when he was granted a license to cut timber there. Henderson took a personal interest in the growth of the village, arranging for the provision of the land for the present school. Henderson's original streets were named after his children. It is quite possible therefore that Catherine Street, which lies adjacent to Catherine Esplanade, was one of these streets.

Flax mills were also a significant industry of the same period, with mills located in the region of the Lower Oratia Stream. Other industries established nearby, included a heel and toe plate factory situated near the stream, which harnessed its water (Hallett in Northcote-Bade 1992: 106), along with several brick yards.

Gumdigging in West Auckland was never as large a scale operation as it was further north, but it still proved to be a lucrative industry. Unlike most industries in the area, it took little capital to begin, with only a spade, spear and bag to put the gum in.

Often it was a practice utilised by farmers on their land as it often made the difference between losing and keeping the land during the first few years of ownership, whilst other produce was developing. It was also an occupation for many released prisoners, with an infamous camp near Swanson, called Don Buck's Camp, being the most notable camp of this era. The general practice was to plough the land, pick the lumps of gum out of the soil, scrape the earth off them, then sell them to the buyers in Auckland, the gum being used as a varnish or firelighter.

The railway was built in the 1860's, with the first passenger train arriving on the 17th March 1881. Built initially as a means of transporting timber, the passenger service became a popular means for people to travel and was used frequently by people going to the horse races at Henderson (Hallett in Northcote-Bade 1992: 106-107).



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The Western Districts evolved as an area for agriculture and viticulture as settlers followed the loggers and gumdiggers. Both horticulture and viticulture became synonymous with the region. The first attempt at commercial horticulture was the nursery established in 1854 by John and Thomas Parr at Parr's Corner on West Coast Road. Their surname gives rise to the road Parrs Cross Road, which is the southern extent of the reach of the Lower Oratia Stream. Many Yugoslav families also came to make a living in the area among the dairy farms. While the Corban family from Lebanon started their vineyard, horticultural and mixed farming operation. Henderson eventually became the centre of the agricultural district. Refer to **Appendix E** for historic images of Lower Oratia Stream and surrounds.



OBJECTIVES AND POLICIES

1.0 VISION STATEMENT

The Lower Oratia Stream corridor, encompassing both reserves and private land, is to be restored to a healthy ecosystem and to provide a range of passive recreational opportunities that lie within the context of the natural environment.

2.0 RECREATION AND USE

The Lower Oratia Stream is the central feature of the Oratia corridor, yet it is not always the key focus. The reserves in the corridor require the incorporation of the recreational ideals of the Reserves Act, such as 'providing for the preservation and management of areas for the benefit and enjoyment of the public', and 'promoting the protection of the natural character of the margins of lakes and rivers' (Reserves Act 1977).

The Lower Oratia Stream connects the suburbs of Sunnyvale and Henderson to the Waitakere Ranges via open spaces in an alternative manner to the road network. Close to this stream lie places of public use, such as Sunnyvale Primary School, Sunnyvale Railway Station, Holy Cross School, Westfield Shopping Centre and the retail sector of Henderson, Henderson Railway Station and Henderson Public School. Along with these community-focused buildings, light industrial buildings back onto the stream. All these uses, along with the predominantly residential land use, make it appear reasonable to locate a cycle walkway route to follow the stream in order to provide connections to these different activity nodes. Community opinion also favours a walking or biking trail following the stream.

Objective:

To provide passive and active recreational opportunities that incorporate an appreciation of the riverside character, including direct pedestrian and cycle access to surrounding community use activities.

Policy 2.1:

Provide passive and active public recreational uses along the reserves of the Lower Oratia Stream.

Implementation:

- Allow for recreational facilities to the southern end of the Oratia Esplanade.
- Provide a range of walking routes to suit a variety of users. Incorporate boardwalks, bridges, and lookout pontoons in the cycle walkway network where appropriate.
- Provide seating as appropriate along with picnic / BBQ opportunities.
- Retain open grassed areas for passive recreation.
- Provide a mixed use cycle and walkway along the entire length of the Lower Oratia Stream where possible.

Policy 2.2:

Provide for the appreciation of the riverside character throughout these reserves.

Implementation:

- Ensure some visual access to the stream and its embankments is retained from the combined cycle and walkway.
- Incorporate educational features such as signage along the cycle and walkway route.



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- Incorporate natural materials with a streamside theme where appropriate and within Waitakere City Council's parks budget.
- Provide an interpretation trail through the reserves identifying elements of interest.
- Provide viewing platforms over the stream at appropriate locations.
- Enhance the reserves with suitable native plant species planted in a manner in keeping with the natural character.
- Ensure planting allows for views of the stream.

Policy 2.3:

Provide a safe environment for reserve users.

Implementation:

- Implement "Safer Design for the Green Network: Design Guidelines" to ensure that buildings, facilities and plantings are designed and maintained in a way that minimises safety concerns and maximises surveillance.
- Clearly highlight major entry and exit points to the reserve, with signage and strong entrance features.
- Provide signage at all junctions, key locations, entries and exits.
- Locate cycle and walkways where good surveillance exists, particularly at the tops of banks where views can be obtained from both sides.
- Maintain clear visibility where planting is adjacent to a walkway through the use of low growing species.
- Provide seating at points with good sightlines along the path.
- Incorporate accessways to link with main paths on both sides of

reserves to allow users to easily enter and exit walkways.

- Liaise with neighbouring properties to encourage the construction of low, permeable fences, or, where possible, the removal of fences adjoining the reserve.
- Ensure that any new fencing required along the reserve boundaries adjacent to the cycle and walkway are permeable.
- Allow for low screening planting where there is existing impermeable fencing along reserve boundaries adjacent to the cycle and walkway, in order to deter graffiti and enhance amenity.
- Unless otherwise required, Council dog bylaws will apply to all areas covered by this Plan.
- Maintain all play equipment in accordance with NZS 5828 and Council Safety Standards. All buildings and structures shall comply with the Building Code.
- Consider Occupational Health and Safety issues in the design and maintenance of structural elements of the reserve.
- Maintain pathways and their sightlines along with other features and structures of the reserve.
- Provide shade trees near seating areas.

3.0 ECOLOGICAL VALUES

The Lower Oratia Stream is an important tributary of Henderson Creek, which leads out to the Waitemata Harbour. The Lower Oratia Stream itself is considered a potential significant passageway for native aquatic life, with a relatively high level of diversity apparent. The restoration and revegetation of the stream and its margins is a primary aim of the sustainable management of these reserves.



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Objective:

Protect and enhance the natural ecosystems of these reserves, especially the streams and their margins.

Policy 3.1:

To protect the natural ecosystems of these reserves.

Implementation:

- Protect existing ecological communities along the stream, as identified in the Tamaki Ecological District Survey Report for the Protected Natural Areas Programme. Refer to **Appendix F** for information on these ecological communities.
- Identify areas of embankment instability, and incorporate stabilising works into planting plans.
- Provide habitat features throughout streams and the reserves, such as rocks and old logs.
- Provide riparian planting as a habitat for the food source of fish.
- Monitor and control weed growth.
- Remove rubbish from stream and reserves on a regular basis.
- Formalise the pathway network prior to planting, to encourage the public to utilise a set route in order to protect the existing and proposed planting. Use permeable pathway materials where appropriate.

Policy 3.2:

Enhance the natural ecosystems of the reserves, especially the streams and their margins, to increase their ecological value and their visual appearance.

Implementation:

- Revegetate streams, riparian zones and embankments in particular, with appropriate, eco-sourced plant species.
- Source plant material according to Council and Ecowater's eco-sourcing policy.
- Undertake regular mowing of grassed areas, in line with the Parks mowing schedule.
- Where possible, retain open grassed areas – utilising native, eco-sourced grass species such as *Carex sp.* as much as possible, at the top of embankments in reserves and around pathways.
- Provide detailed planting plans for all planting works proposed along stream for Council records.

Policy 3.3:

To remove exotic weeds where viable.

Implementation:

- Stage weed removal in conjunction with revegetation so as to prevent erosion, sedimentation and weed re-establishment.
- Minimise soil disturbance on reserves. Ensure all works comply with ARC technical publication 90 (TP90) regarding sediment control.
- Establish a community consultation process to allow for extra dialogue, including alternatives for the current bamboo screen planting along Millbrook Road.

Policy 3.4:

Encourage the public's appreciation of the natural environment and ecosystems.

Implementation:

- Encourage community groups, including corporate groups from the commercial/ industrial areas to participate in the planting.



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- Encourage the community to take ownership of reserves.
- Encourage community participation in Project Twin Streams activities taking place in the reserves.
- Use signs relating to the natural environment and ecosystem where appropriate.

4.0 CULTURAL HERITAGE AND HISTORY

Maori Cultural Heritage:

The history of the reaches of the Lower Oratia Stream is of significance to Maori. It is in everyone's best interest to incorporate sustainable management into the recognition and protection of this cultural heritage.

Objective:

To recognise, protect and convey where appropriate, the Maori cultural and historical values of the Lower Oratia Reserves.

Policy 4.1:

To recognise the Maori cultural and historical heritage.

Implementation:

- Provide District Plan protection for all identified and recorded archaeological sites.
- Work with Iwi to ensure that archaeological sites are protected by the most appropriate means and added to the Historic Places Trust records.
- Consult with Iwi to develop artwork signage that incorporates cultural values.

European Cultural Heritage:

The Lower Oratia Stream also has a rich European history, from the initial timber milling that occurred, through to it being settled and developed, becoming a major horticultural and viticultural area.

Objective:

To recognise, protect and promote, where appropriate, European cultural history.

Policy 4.2:

To identify and protect sites of European cultural significance.

Implementation:

- Identify sites and features, including trees, of historic cultural significance along the reaches of the Lower Oratia Stream.
- Register future finds regarding significant places or items with the Historic Places Trust, the West Auckland Historical Society, and with the ARC Cultural Heritage Inventory, and in the District Plan as appropriate.
- Consult with West Auckland Historical Society on the best means of protection and management of historic sites and features.
- Prepare a conservation plan for any highly significant historical sites.
- Where possible, and within the Parks budget, install public art with a heritage focus, or interpretation signage at the location of elements of historic value particularly along the streamside walk.



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5.0 WATER QUALITY

The water quality of the Lower Oratia Stream is described as moderate compared to other Waitakere region streams. Stormwater discharges into the stream and ultimately to Henderson Creek and the Waitemata Harbour. As mentioned earlier, the stream's ecological values are considered poor, mainly due to sedimentation issues (**refer to soils and water quality descriptions in Part 1: section 6**). Other key impacts on the water quality of the stream include bank erosion, the dumping of rubbish in the stream itself and contaminated stormwater from surrounding roads and industries.

Objective:

Improve the water quality of the Lower Oratia Stream.

Policy 5.1:

Reduce the amount of sedimentation accumulating in the Lower Oratia Stream.

Implementation:

- Minimise soil disturbance
- Revegetate stream banks with appropriate species to promote bank stabilisation.
- Allow for engineering works for stabilisation of banks, as required.
- Reduce the amount of impermeable surfaces.
- Monitor the stream before, during and after works to the reserves occurs.
- Where possible use rip rap rock work with riparian planting infill.

Policy 5.2:

Reduce the amount of stormwater overflow into the Lower Oratia Stream.

Implementation:

- Allow for stormwater drainage guards such as Biofilters in reserves, where required.
- Use permeable paving as much as possible throughout the reserves of the Lower Oratia Stream.

Policy 5.3:

Educate the public on water quality issues

Implementation:

- Allow for the 'daylighting' of drains in the reserves.
- Supply rubbish bins in areas of greatest use in reserves as appropriate.
- Work with local businesses to implement programmes to reduce and recycle waste.
- Work with neighbours to reduce the illegal dumping of rubbish over boundary fences.
- Liaise with local supermarkets to develop and implement a strategy to reduce the dumping of supermarket trolleys.
- Investigate the use of signs appropriately located in the reserves to highlight the impact of illegally dumping weeds.
- Support education programmes to encourage responsible disposal of rubbish by local residents and members of the public.
- Establish a buffer along both sides of the Stream to reduce the opportunities for vehicle access and rubbish dumping in the Stream and the reserves.
- Promote the awareness of stream and water quality through artwork, signs, activities and management practices.
- Encourage community participation with clean up events in the reserves.



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Policy 5.4:

Improve the water quality of the Lower Oratia Stream as a habitat for native aquatic species.

Implementation:

- Replace exotic and invasive species growing along the stream with appropriate indigenous species (taking into account habitat value).
- Allow for the retention of canopy trees to provide shade along the stream itself.

6.0 OPPORTUNITIES FOR PEOPLE TO ENJOY NATURE ON THE RESERVES

The Lower Oratia Stream reserves are there for the public to enjoy. Opportunities should be provided for this and the protection of the environment.

Objective:

Protect the natural character of the Lower Oratia Stream for the benefit and enjoyment of the public.

Policy 6.1:

Promote an understanding of the natural character of Lower Oratia Stream.

Implementation:

- Provide a nature / streamside trail with access to the Stream where possible, as proposed for Project Twin Streams.
- Use signage boards and art features to illustrate the importance of the natural environment of the Lower Oratia Stream

- Provide viewing platforms and boardwalks that encourage close proximity to the stream and its ecosystem. Co-ordinate lookouts and other features with educational signage boards to encourage an interactive appreciation of the streamside ecology.
- Where possible install seating at locations allowing for views of the Stream.
- Encourage community events such as planting days.

Policy 6.2:

Provide opportunities to celebrate the natural character of the Lower Oratia Stream.

Implementation:

- Support events in the reserves that celebrate the history, culture and landscapes of the reserves and of the community.
- Allow for temporary community events to occur in the reserves such as fun runs, or community festivals where compatible with ecological values.
- Ensure that any event in the Lower Oratia Reserves does not conflict with the overall natural character and ecological values of these reserves.
- At the conclusion of any event, the reserves these events were held in shall be reinstated to the condition prior to the event (planting days could be included to achieve this).

7.0 LANDSCAPE VALUES

There are currently few structures in the reserves of the Lower Oratia Stream, with perhaps the exception of Hart Domain, which has a children's playground. The overall natural character of these reserves should be preserved. Where structures are required, they should not obstruct views or stand out as uncomplimentary to the natural character of the reserves.



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Objective:

Retain the natural character of the landscape throughout the entire chain of reserves.

Policy 7.1:

Minimise the impact of structures on the reserves.

Implementation:

- Ensure that the materials used for any structures are compatible with the natural character of these reserves.
- Ensure structures don't create a flood hazard.
- Ensure that structures such as footbridges or boardwalks do not have a detrimental effect on the landscape or ecological values of the reserves.

Policy 7.2:

Reduce the impact of physical processes on the landscape values of the Lower Oratia Stream corridor.

Implementation:

- Reduce bank destabilisation with planting of appropriate grasses and pioneer plants initially to allow for the establishment of plant communities to progressively take over this role.
- Use plants that will tolerate flood events.
- Wherever possible use soft engineering solutions, if required.
- Prevent activities that will compromise the natural formation and stability of the Stream banks.

Policy 7.4:

Incorporate Maori values into the Lower Oratia Reserves.

Implementation:

- Involve Iwi groups in any design projects in the reserves.

8.0 ACCESS, PARKING AND CIRCULATION

The close proximity of local schools, railway stations, industrial and commercial areas to the Lower Oratia Stream, means safe pedestrian access that provides connections to these activities is important. Public submissions also indicate that the majority of respondents would like to see a cycle and walkway along the stream that connects to major uses (**Refer to Appendix C** for a summary of community submissions).

As most of the reserves along the Lower Oratia Stream are esplanade reserves, it is recommended that the main forms of access remain as pedestrian and cycle ways. The exclusion of vehicular traffic (except for allowance for emergency vehicles), would help to highlight and protect the natural character of these reserves.

Objective:

Provide safe and user-friendly access and connections to and from activity nodes that occur along the Lower Oratia Stream. Retain the natural character of these reserves in the implementation of circulation routes and parking areas.

Policy 8.1:

Provide cycle and walkway links that provide connections to major activities.

Implementation:

- Provide a cycle and walkway that connects Henderson commercial centre to Sunnyvale Railway Station. Include links to centres of importance, such as Sunnyvale Public School, along this route.



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- Provide a cycle and walkway route along the Lower Oratia Stream from Sunnyvale Railway Station until the southern extent of the reserves.
- Provide a cycle and walkway connection between the Lower Oratia Stream reserves and Parrs Park.

Policy 8.2:

Encourage the local community to utilise cycle and walkway links.

Implementation:

- Improve cycle and walkway connections between major facilities, without compromising the natural character of the reserves.
- Use clear signage, possibly including maps, to indicate walkways and linkages.
- Encourage surveillance along the route through safety design features, open spaces, and the maintenance of views from properties along the route.
- Ensure that entrances and exits to walkways are clearly marked attractive, and well maintained.

Policy 8.3:

Minimise vehicular access and parking to the reserves.

Implementation:

- Restrict parking opportunities to the larger reserves.
- Restrict vehicular access to sensitive areas along the Lower Oratia Stream so that only emergency vehicles may enter.
- Construct parking areas out of permeable paving where possible.

9.0 ADMINISTRATION AND MANAGEMENT

The overall structure for the management and administration of these reserves is outlined in the Reserves Act 1977. In addition, due consideration should be regarded to the Resource Management Act 1991 and, the District Plan under which this Plan was prepared.

The effectiveness of this Management Plan needs to be constantly monitored. Council By-laws equally, need to be integrated within the intent of the Management Plan. This is particularly important in respect to the interface between Reserves, dog control and public behaviour within the reserves.

Objective:

To ensure the reserves are managed in terms of their reserve classifications for the enjoyment and use of the local and regional community, now and in the future.

Policy 9.1:

To classify all reserves appropriately according to their use and value in order to best ensure their continued protection and use.

Implementation:

- All reserves covered by this Management Plan shall be appropriately classified under the Reserves Act 1977.
- Ensure that any additional parcels of land, which may be added to the Lower Oratia Stream reserves in the future, are classified appropriately in terms of their contribution to the Green Network and the existing reserve framework.



Part 2

Policy 9.2:

Any activity or development not provided for under the Policies and Implementation in the Management Plan will not be permitted unless such an activity or development at least complies with the District Plan rules for Open Space Environment and the General By-laws 1990.

Policy 9.3:

The actions identified in the Policies are necessary to achieve the objectives of the Management Plan. To implement the actions outlined within each Policy in this document, Waitakere City Council will follow an Annual Plan process to allocate funds for these actions.

Policy 9.4:

To provide for user concessions by way of permit for special events as detailed in earlier Policy 6.2

Implementation:

- Grant permits for temporary concessions or events for the use of areas of the reserves that are compatible with the objectives for the reserves and in accordance with policy or implementation under this Management Plan. Applications would be made to the Manager of Parks, who may consult with the Community Board as required to assess such applications.
- Allow permits for hireage related to appropriate recreational opportunities, including water recreation, at appropriate sites as approved by the Manager of Parks.
- Permits for special events may incur an additional bond or charge in respect to the potential for damage and public liability, or the need for remedial works.

- Concessions may be granted in respect to refreshments and for wheeled transport compatible with the values of the Reserves.

Policy 9.5:

To use the control of lease agreements to ensure the most effective equitable use of the Lower Oratia Stream Reserves and facilities.

Implementation:

- Ensure that the leasing of areas of land within the reserves provides for community use and well-being. The leases of facilities such as buildings should ensure the maximum potential of the reserve is realised for the community.
- Ensure that new leases conform to the criteria as set out in the Community Assistance Policy and Parks Strategy. In addition the applicant will need to satisfy the Waitakere City Council that the proposed use:
 - Will be in accordance with the Objective and Policies of this Plan;
 - Will be in accordance with the Reserves Act 1977;
 - Will not detract from the existing environment and use of the park;
 - Will generally provide a benefit (or benefits) to the public which is greater than any adverse effect caused by granting the lease;
 - Is in an appropriate location;
 - Will not cater exclusively to any one sector of the public, except where this is provided for and is appropriate in terms of the Objectives and Policies of this Plan.
- Revise and renew all existing leases in accordance with the criteria listed above.



Part 2

Policy 9.6:

Keep this Management Plan under regular review.

Implementation:

- Continually monitor the impacts of activities mentioned in this Management Plan for effectiveness.
- A continuous review of this Management Plan should occur as outlined in section 41(4) of the Reserves Act 1977.
- Subject to subsection 41(3) of the same Act, ensure the Plan is adapted to changing circumstances or in accordance with increased knowledge; or if the Minister for the Environment requires it.
- Undertake a full review of the entire Plan within ten years of the date of approval.



CONCEPT PLANS AND DESIGN GUIDELINES

1.0 INTRODUCTION

This section looks at the proposed concepts and subsequent design guidelines that relate to the Management Plan for the reserves of the Lower Oratia Stream. Included are the Concept Plans themselves, along with design descriptions relating to the proposed development work that should occur, and the priority of the implementation of the work.

2.0 CONCEPT PLANS

The following Concept Plans implement the policies and objectives identified in Part 2 of this Reserves Management Plan. The Concept Plans indicate each reserve that adjoins the Lower Oratia Stream, and the specific opportunities and constraints that apply for each of them. The Plans should be read in conjunction with the following descriptions and design guidelines. These Plans are Concept Plans, and are therefore schematic only. Further detailed design work and planting plans, based on this Management Plan and the Concept Plans, will be required in order to implement any of these suggestions.

3.0 TABLE OF WORKS

This Table provides management works proposed for each of the reserves along the Lower Oratia Stream. These works have been developed from the objectives and policies discussed in Part 2 of this Management Plan.

Comments from community input have been considered and incorporated in the formulation of both the objectives and policies, along with these management works.

4.0 REVEGETATION GUIDELINES

These guidelines provide additional information to Concept Plans. They also tie in the policies and objectives outlined in Part 2 of this Reserve Management Plan. The overall aim of these design guidelines is to provide consistency throughout all reserves along the Lower Oratia Stream, and to ensure that the vision statement expressed in Part 2 is applied. This being:

"The Lower Oratia Stream corridor, encompassing both reserves and private land, is to be restored to a healthy ecosystem and to provide a range of passive recreational opportunities that lie within the context of the natural environment."

The Revegetation Guidelines relate to Waitakere City Council's 'A Guide for Planting and Restoring the Nature of Waitakere City' document along with ARC's 'TP90: Riparian Planting Guidelines'.

Specific guidelines are found in the Appendices: Appendix D Oratia Catchment Planting Guidelines and Appendix F Riparian Restoration Guidelines.



Part 3

Placeholder page for 03208-001c A3 BW concept1.pdf



Part 3

Placeholder page for 03208-002c-A3 BW concept plan.pdf



Part 3

Placeholder page for 03208-003c-A3 BW concept plan.pdf



Part 3

Placeholder page for 03208-004c-A3 BW concept plan.pdf



Part 3

Placeholder page for 03208-005c-A3 BW concept plan.pdf



TABLE 3.0 – TABLE OF WORKS

PROPOSED WORKS WITHIN RESERVES			
Reserve No.:	Reserve Name (alphabetical order)	Proposed Development/ Work to occur within the Reserve	Priority Rating for Work
1	Catherine Esplanade	• Provide seating areas that overlook the stream. • Remove and manage weed growth. • Revegetate embankments with riparian and native planting. • Reinforce safe connections or 'gateways' to adjacent industrial buildings. • Widen walkway to 2m minimum.	Medium
2	Hart Domain	• Retain existing design elements in reserve (i.e. children's playground). • Continual maintenance. • Remove and manage weed growth. • Infill revegetation in areas of embankment where planting has not established. • Provide additional active play opportunities such as a skate ramp. • Augment street tree planting with additional Claret Ash (<i>Fraxinus raywoodii</i>).	Low
3	Millbrook Reserve	• Provide streamside link between Sunnyvale Primary School and Millbrook Road, along with Serwayne Walk and Reserve. • Remove and manage weed growth. • Maintain existing native planting, particularly recent revegetation area on embankment. • Provide a viewing point. • Existing <i>Pinus radiata</i> trees to remain subject to arborist's assessment. • Include community consultation in developing alternatives for the current bamboo screening along Millbrook Road. • Extend street tree planting from Hart Domain along Millbrook Road.	Low



PROPOSED WORKS WITHIN RESERVES			
Reserve No.:	Reserve Name (alphabetical order)	Proposed Development/ Work to occur within the Reserve	Priority Rating for Work
4	Oratia Esplanade	• Provide cycle and walkway link from Sunnyvale Railway Station to Parrs Park. • Include boardwalk and lookouts. • Include interpretive signage, and environmental education points. • Remove and manage weed growth. • Revegetate embankments with native eco-sourced riparian species. • Plant, where possible, eco-sourced native species throughout. • Retain and provide fauna habitats where appropriate. • Align bridges with accessways. • Include picnic /BBQ facilities in open grassed area. • Open up views/ sightlines beside residential subdivisions and pathways. • Retain existing <i>Populus deltoides</i> subject to Arborist's assessment. Southern End of Oratia Esplanade: • Provide a pedestrian connection to adjacent residential streets and to Parrs Park. • Provide a fitness trail. • Include adult playground features such as adult sized jungle gym. • Remove weeds. • Revegetate embankment with eco-sourced riparian species. • Plant, where possible, eco-sourced species throughout. • Include specimen tree, open grass and play areas. • Retain existing native canopy and understorey planting. Mid-Section of Oratia Esplanade: • Provide a pedestrian connection to adjacent residential streets and to Parrs Park. • Provide streamside cycle and walkway link. • Streamside pedestrian link to include boardwalk and lookouts. • Provide open areas of low growing eco-sourced natives, particularly grasses around walkway.	Medium



Part 3

PROPOSED WORKS WITHIN RESERVES			
Reserve No.:	Reserve Name (alphabetical order)	Proposed Development/ Work to occur within the Reserve	Priority Rating for Work
4	Oratia Esplanade	• Include interpretive signage, and environmental education points. • Retain existing <i>Populus deltoides</i> and <i>Pinus radiata</i> subject to Arborist's assessment. • Include specimen tree planting.	Medium
5	Railside Reserve	• Remove and manage weed growth, ensuring embankment stability. • Revegetate with eco-sourced riparian and embankment plant species. • Place public artwork that relates to the history of the Lower Oratia Stream, which can be viewed from the opposite bank.	Low
6	Serwayne Place Reserve, working title (includes Millbrook Esplanade)	• Implement proposal dated 24/03/2003. • Remove and manage weed growth. • Revegetate with eco-sourced native riparian species. • Plant, where possible, eco-sourced native plants throughout. • Include / retain fauna habitat features where appropriate. • Include picnic /BBQ facilities in open grassed area. • Provide cycle and walkway access to Sunnyvale Station through reserve from Sunnyside Road.	High
7	Seymour Road Proposed Esplanade Reserve	• Implement Park n' Ride shown on proposal dated 24/03/2003. • Remove and manage weed growth. • Revegetate embankment with eco-sourced native riparian species. • Include / retain fauna habitat features where appropriate.	High



PROPOSED WORKS WITHIN RESERVES			
Reserve No.:	Reserve Name (alphabetical order)	Proposed Development/ Work to occur within the Reserve	Priority Rating for Work
8	Vitasovich Esplanade	• Retain existing path. • Provide seating with stream views. • Include public or community art throughout reserve in areas of high visibility. • Remove and manage weed growth. • Revegetate riparian margins and embankments with eco-sourced native planting. • Include specimen indigenous tree species. • Maintain connections or 'gateways' to adjacent Westfield shopping centre. • Ensure view corridors to stream and vegetation along stream. • Include interpretive signage.	High

4.0 REVEGETATION GUIDELINES

The revegetation of the Lower Oratia Stream reserves is a main feature of the restoration works, and ties in closely with Project Twin Streams. This section identifies the appropriate species as suggested by the Waitakere City Council planting guidelines. It should be kept in mind that as detailed flora and fauna assessments of these particular sites have not occurred as yet, the vegetation listed here is a guideline only. A definitive list should be compiled once this assessment has occurred.

From the ecosystems mapped in the 'Nature of Waitakere City' document, the Lower Oratia Stream lies in a warm lowland ecosystem. The predominant tree species is identified as Puriri (*Vitex lucens*), with the Kereru (Wood Pigeon) being the predominant bird species.

Under this classification, the stream flows through a number of sub-classifications including:

- Waitemata Lowland Forests – whose main characteristics include

free-draining fertile soils and gentle slopes; and

- Alluvial Flood-Zone Forests – whose main characteristics include free-draining, deep fertile soils on flood-prone valley floors.

'The forests of the lowlands have a characteristically broken, irregular and lower canopy due to mid-canopy trees being uncommon. This results in an abundance of tree ferns, small trees and shrubs, and reflects the hilly nature and low-nutrient status of the ancient weathered volcanic soils' (King 1996:11). On the Waitemata lowlands, due to the deep friable soils, broadleaf trees were common, with large glades of puriri (*Vitex lucens*), karaka (*Corynocarpus laevigatus*) and titoki (*Alectryon excelsus*). **Appendix D** gives guidelines for planting in the Oratia Catchment. **Appendix F** lists suggested plants species for planting in riparian zones. These plant guidelines include planting regimes for floodplains, moderate slopes and over-steepened slopes.



5.0 REFERENCE LIST

Auckland Regional Council (1999). *'Auckland Regional Policy Statement'*, Auckland Regional Council, Auckland.

Boffa Miskell (2004). *'Waitakere Native Freshwater Fish Monitoring Program: Fish Survey 2004'*, Boffa Miskell, Auckland.

Ecowater (2004). *'Draft Riparian Restoration Guidelines'*, Ecowater, Auckland.

Envirologic, Environmental and Resource Consultants (2003). *'Waitakere City Biodiversity Monitoring Programme: birds, lizards and frogs'*, Envirologic, Auckland.

Garriock, J., Sleeman, C. and Crane, S. for West Auckland Society (1991). *'A Pictorial History of West Auckland'*, Uniprint, Auckland.

Julian, A., Davis, A. and Tyrrell, M. (1998). *'Draft Report: Ecological Survey of Waitakere City Lowlands: Northwestern Portion of Tamaki Ecological District, Significant indigenous vegetation and significant habitats of indigenous fauna'*, Produced for Waitakere City Council, Auckland.

Kingett Mitchell and Associates Ltd (2001). *'Oratia/ Opanuku Stream Restoration Riparian Enhancement and Management Concept Study'*, Kingett Mitchell and Associates.

New Zealand Government (1991) *'Resource Management Act'*, New Zealand Government.

New Zealand Government (1977) *'Reserves Act'*, New Zealand Government.

Northcote-Bade, J. (ed). (1990). *'West Auckland Remembers'*, Uniprint, Auckland.

Scott, D. (1979). *'Fire on the Clay: Pakeha comes to West Auckland'*, Southern Cross Books, Auckland.

URS (2003). *'Project Twin Streams: Geotechnical Evaluation of the Lower Oratia Stream Corridor'*, URS, Auckland, New Zealand.

Waitakere City Council (2004). *'Oratia Catchment Planting Guidelines'*, from Waitakere City Council webpage.

Waitakere City Council (2002). *'Te Huru huri – Henderson Creek Corridor: Draft Reserve Management Plan'*, Waitakere City Council.

Waitakere City Council (1999). *'A Guide for Planting and Restoring the Nature of Waitakere City'*, Waitakere City Council.

Waitakere City Council (1999). *'Parks Strategy'*, Waitakere City Council.

Waitakere City Council (1999). *'Weed Strategy'*, Waitakere City Council.

Waitakere City Council (2003). *'Operative District Plan'*, Waitakere City Council.

Waitakere City Council (1996). *'Greenprint Waitakere'*, Waitakere City Council.

Waitakere City Council (1996). *'Safer Design for the Green Network: Design Guidelines'*, Waitakere City Council.

Wises (2003). *'Auckland Street Directory'*, Wises Maps, Auckland.



Appendix A

Schedule of Native and Exotic Weeds
found along the Lower Oratia Stream

Appendix B

Serwayne Place Landscape Concept Plan:
prepared for the Twin Streams Project.

Appendix C

Summary of Community
Consultation Information.

Appendix D

Oratia Catchment Planting
Guidelines Information Sheet

Appendix E

Historic maps and images of
the Lower Oratia Stream

Appendix F

Draft Riparian Restoration Guidelines