# Urban Forest Plan

## Hutt City, a city of thriving forests and flourishing trees

Adopted by Council 2009, went live 1 January 2010

DOC/10/28169

HUTT CITY
TE AWA KAIRANGI

# Table of Contents

# Forward

Our urban forest provides a wide range of benefits which are essential to the health and function of our city today and into the future.

It is our pleasure to present Council's first Urban Forest Plan. The City's Urban Forest is a great responsibility and, if we manage it well, will bring us and future residents tremendous benefits. As it exists today, the urban forest provides a wonderful foundation which can be enhanced over time in a strategic way.

Our urban forest provides us with vital services – climate control, habitat, biodiversity, soil conservation, water quality conservation, carbon sequestration, gas and nutrient cycling. Overseas studies also point out the importance of urban forests in terms of improved property values, community well being and recreation opportunities. The urban forest provides a seasonal indicator. Elements of our urban forest have important historical and cultural associations.

The document outlines the components of our urban forest and proposes methods for maintaining and improving the forest in order to offer the city greater benefit. By following this document we're on track to achieving a more sustainable forest where, even though our urban forest depends on human intervention, outputs far exceed inputs. We will manage the naturally occurring and planted trees to provide the City and Region with enhanced ecological, environmental, community and amenity benefits. No doubt we will learn things along the way and it will be necessary to revise this Plan in the future.

We thank those people that helped to prepare this plan; especially submitters who participated in the public consultation process in 2009. You have made a contribution to an important document that will guide Council for the next 20 years.

**Councillor Margaret Cousins**
**Chairperson Strategy and Policy Committee**

**David Ogden**
**Mayor**

# Introduction

> *"Trees are our link between earth and sky; symbolizing strength, protection and longevity, they are vital in maintaining the balance of climate and fragile ecosystems of our planet. Not only are trees the most majestic and the longest lived of plants on earth, they are the most crucial and the most beautiful, their presence as natural and reassuring as the land, the sea and the sky. Surely all of us at some stage of our lives have marvelled at the sight, the sound or simply the smell of a single tree, the beauty of the wood or the stillness of a forest."*
>
> *Petherick, 2006*

Compared to those living in most other urban centres in New Zealand, Hutt City residents still live pretty close to nature.

Residents hanging out washing in the Eastern Bays observe bellbirds. Maungaraki residents enjoy the massed chorus of cicadas in Belmont Regional Park. Volunteers in Hayward Scenic Reserve report extraordinary high numbers of land snails. Artists collect a variety of flaxes from suburban reserves for weaving. Experiences like this are occurring every day – in our City. The tangible benefits of the urban forest described here all have an underlying reliance on vegetation and habitats, many of which Council is responsible for. Even those components of the urban forest of which people are unaware affect their lives, for example the forest's contribution to oxygen supply, water quality and soil conservation.

This Plan describes the forest assets in this city and explains their significance and purpose. The Plan dwells on Hutt City Council's responsibilities but recognises that Hutt City Council is just one player involved in the management of vegetation and habitats within our territorial boundary, region and conservancy.

Clearly the City's Urban Forest, in its entirety, is valued and generates benefits locally and beyond. This Plan establishes the values associated with the Urban Forest and sets out principles and policies to guide the management of the Urban Forest. Council has plans for a thriving and flourishing future which will be enhanced by a well managed urban forest.

This Plan has been prepared with Council's asset management planning system in mind. Historically the City's urban forest has been managed without a policy or planning framework to guide lifespan, renewal and expansion. Trees, like pipes and roads, are a finite asset, and they are an important part of our community. Unlike pipes and roads, Hutt City residents are emotionally attached to our urban forest. Preparation of the Draft version of this Urban Forest Plan has identified a number of facts that will allow planning and decision making to be more strategic and objective than it has been in the past.

This Plan provides the basis for developing an Asset Management Plan where the vegetation Council is responsible for, including street trees, trees in urban parks, reserves, cemeteries and sports grounds as well as "natural areas" is recognised as a key component of our city.

# Summary

Consultation and advice from industry professionals has confirmed that the urban forest is a special and valued component of this City. Comments provided in the consultation process generally supported the visions, objectives and polices set out in the Draft Urban Forest Plan. Changes have been approved by our elected members and incorporated into this final document. This document represents the work and ideas of many.

Urban open space planning provides for multiple objectives. The more functions that a landscape provides the greater its worth to the system. This growing range of objectives is a challenge that Council faces.

The intention of this plan is to provide policy to guide decision making about vegetation management on land Council is responsible for. The vision will be achieved when Hutt City's urban forest reaches a point that optimally benefits inhabitants and enhances environmental sustainability. This will require dedication to uphold the integrity of the plan, negotiation, planning, budget commitment and patience.

This Urban Forest Plan sets out strategies for the city's natural areas, urban parks and street trees. There is a strong emphasis on providing connected native habitats and quality specimen trees. The task is challenging but the result will be well worthwhile.

As directed by Council, this Plan went live on 1 January 2010. This Plan is supported by a number of other lower level documents. They include:

- Operational Guide to the Urban Forest Plan 2011
- Planning for Street Trees – Ward Themes and Street Tree Master Plans – 2011
- Ward Theme for Central Ward – 2011
- Guidelines for Street Tree Planting Locations - 2011
- Preferred Species list - 2011

# Visions, Objectives and Policies

## VISION 1: NATURAL AREAS

A connected web of natural areas at a large scale, with (primarily) ecological motives and a focus on a high level of native ecosystem diversity, to support high native species diversity over the long term and with minimal intervention.

### Objective 1.1: Connectivity and Expansion

To establish ecological corridors between existing public open space to improve connectivity and to increase the ecological function of the linked sites, adding new key areas as opportunities arise.

1.1.1 Council discourages fragmentation of existing natural areas on the basis that it gradually erodes the function of natural areas. On the flip side, Council encourages actions that will improve the connectivity of natural areas.

1.1.2 Treat Council's existing public open spaces and the native habitats they contain as part of the foundation to base connectivity improvements on. DoC, GW and private property owners are also significant in terms of achieving ecological connectivity in and beyond Hutt City

1.1.3 Work alongside the Lower Hutt Branch of RNZF&BPS to achieve their dream of connecting large areas of public open space in Hutt City and beyond the HCC territorial boundary. This is likely to involve DoC, GWRC, PCC, UHCC and WCC and private property owners.

1.1.4 Expand and enhance Council's existing network of natural areas in line with Council's Reserve Land Acquisition/Disposal Policy.

### Objective 1.2: Restore and Recover

To improve native habitat condition and enhance ecological function of natural areas, with the long term aim of replicating pre-European habitats and ecology in natural areas to the extent that it is practical to achieve this, recognising the negative impacts on the natural structure and functions of forest ecosystems caused by pests and altered habitats.

1.2.1 Council recognises that sites that currently display limited natural qualities may have great potential to contribute to biodiversity values.

1.2.2 Council will work with other agencies to ensure that no threatened species are lost to the Wellington Hawke's Bay Conservancy.

1.2.3 Council will work with other agencies to ensure that the list of threatened species in the Wellington Hawke's Bay Conservancy does not grow.

1.2.4 Council will prioritise protection, conservation, restoration in sites where habitat is threatened nationally or in the Wellington Conservancy.

1.2.5 Natural processes will be accommodated during restoration.

1.2.6 Council recognises the impact of edge effect and will minimise and mitigate conditions and activities at the margins of natural areas and other lands that are detrimental.

1.2.7 Council will provide opportunities for local native plant propagation material (eco-sourced material to be collected by commercial and not for profit nurseries through a permit system, managed by the Parks and Gardens Division of Council. Management of the permit system will prioritise availability of material to meet HCC, GW and DoC requirements for propagation material to enhance habitats in Hutt City.

1.2.8 Council will specify the use of local native species, which have been propagated from genuine local material, for revegetation work in natural areas.

### Objective 1.3: Well Managed

To maximise long term ecological benefits with available resources in order to pass on thriving, flourishing, sustainable natural areas to future generations (Human and non-human).

1.3.1 Council will prioritise protection of HCC properties containing natural areas using provisions in the Reserves Act 1977.

1.3.2 Council (cooperating with Greater Wellington Regional Council) will control pest plants and pest animals to acceptable levels citywide and to levels that exceed acceptable standards in areas with high biodiversity values. Chemical pest control may be used. Potential and emerging pest plant threats will be managed prudently. Note that this policy is not limited to natural areas. It is relevant to urban parks, street trees and road reserves.

1.3.3 Council will work with other agencies and willing landowners to mange pest animals and grazing stock in and around areas of high ecological value and areas where high ecological values are likely to occur in the long term.

1.3.4 As non-local native plant species may interfere with local ecology through hybridisation or weediness, Council will take a cautious approach to plant selection to limit negative effects caused by new Council plantings. Council will continue to cooperate with GW and other land managers to administer this policy.

1.3.5 In 2011/12 Council will assess whether it is worthwhile for HCC to be involved in the government's emissions trading scheme after MfE release the LUCAS report. Any income generated by participating in this scheme will be applied to local biodiversity initiatives which are aligned with Council's Environmental Sustainability Strategy.

1.3.6 Council will discourage development which increases edge effect or is likely to result in habitat loss or species reduction/loss (particularly of threatened species) or will negatively affect areas with high (or potentially high) biodiversity values.

1.3.7 Council recognises that fire mitigation measures and pest control work are vital management tasks in natural areas.

1.3.8 Council will identify areas of high and potentially high biodiversity values, particularly on land it is responsible for.

1.3.9 Council will uphold policies related to natural areas in both Reserve Management Plans and the complementary Urban Forest Plan.

1.3.10 Council will not establish new stands of exotic forests for carbon credit or harvesting purposes on its land

### Objective 1.4: Community Contribution

1.4.1 Council will work with willing private landowners and other public land owners to improve and sustain native habitats and ecology where the private property can contribute to connectivity, public access or improved ecological values. relates to 1.3.1

1.4.2 Council will provide opportunities for residents to participate in planning, restoring, researching, monitoring, promoting and protecting natural areas by volunteering through the Parks and Gardens Division of Council.

1.4.3 Council will promote the importance and benefits of natural areas and provide opportunities for residents to learn about local habitats and species. This may involve participating in cooperative projects or events with other public agencies.

1.4.4 Council will promote the advantages of using local native plants in gardens, lifestyle blocks, farms and natural areas and it will lead by example.

1.4.5 Council will continue to provide people with access to some parts of some HCC managed natural areas for non-motorised, recreational, educational and research purposes.

1.4.6 Council will provide opportunities for residents and scientists to gather and harvest modest quantities of plentiful plant products from non-threatened species in habitats that are not threatened, through a permit system, managed by the Parks and Gardens Division.

### Objective 1.5: Knowledge

1.5.1 Council will investigate practical, affordable methods for determining the condition of natural areas which it is responsible for.

1.5.2 Council will establish a regular (probably 5 yearly) monitoring programme to assess quantity, condition and threats to natural areas.

1.5.3 Council will track its revegetation efforts and monitor the outcomes. This will include documentation of new plantings by date, site, species and quantity of plants, including plantings by both Council and community groups planting on land managed by Council.

## VISION 2: URBAN PARKS

Urban parks in Hutt City will host a range of large trees (native and exotic) which will make an outstanding and magnificent contribution to the local landscape, without creating unreasonable interference with the recreational requirements of the site, which are valued by users.

### Objective 1.6: Locally Meaningful

Use trees to make urban parks more attractive and interesting to encourage local outdoor activity and social interaction

1.6.1 Protect outstanding specimens and tell their stories. Give trees with historical and botanical significance special management consideration and consider adding them to the Notable Trees list in the District Plan.

1.6.2 Use the "gradient of naturalness" concept when planning new plantings in urban parks; this has particular relevance to urban reserves near the urban edges of the City.

1.6.3 Council accepts that urban parks, particularly urban reserves, offer opportunities to trial species considered to be suitable for areas nearby, say berms.

1.6.4 Council encourages the use of urban parks as venues to demonstrate thriving native and exotic plantings for residents interested in improving private gardens nearby, particularly those species which require few inputs (water, fertiliser, pesticide). In other words the priority will be to display species that perform well in our local conditions.

1.6.5 Council supports the use of plants to stimulate physical and imaginative outdoor play opportunities in reserves.

### Objective 1.7: Large, Magnificent, Outstanding

Consider Urban Parks as venues for host large (15m plus) species that are increasingly impractical to hoist on private properties as the city matures and infills. These trees provide important reference points and identity in neighbourhoods.

1.7.1 Provide large, good quality trees to compensate for the lack of large trees on private properties in urban areas.

1.7.2 Council accepts that poor specimens may be removed when it is apparent that they will not thrive and flourish or when they interfere unreasonably with activities occurring on the site legitimately. Removal of young or small trees that fail to thrive is a priority.

1.7.3 Council prioritises a good quality display of green evergreen and deciduous foliage with appropriate forms, scale, long term health without unreasonable maintenance requirements. Use of coloured foliage (other than green) and variegated foliage will be minimal.

1.7.4 Council agrees that it is necessary to generally outline the desired displays for each sports ground, urban reserve, horticultural park and cemetery site, in order to maximise the benefits.

### Objective 1.8: Planning (generally planting related)

To improve the content of trees in Urban Parks over a 20 year period in order to improve the appearance and use of the sites and the character of neighbourhoods.

1.8.1 Develop a master plan for a 20 year period, ending in 2030, for trees in sports grounds, urban reserve and cemeteries, which will be used for managing trees, identifying areas which require trees and planning new specimen tree plantings. Some sites warrant involving the community or neighbours in tree planning work.

1.8.2 In general the most suitable species for the site will be selected. Where there are choices, natives will be given special consideration. Where site conditions allow, favour native species in urban reserves, sports grounds and cemeteries.

1.8.3 Council accepts the principles of ecological sustainability and management and planning of vegetation, particularly trees, in urban parks will take these into account, particularly use of local native species, water use, chemical use and potential pest species.

1.8.4 Council acknowledges that species which are unsuitable for street trees might be appropriate specimens, in urban parks. A limited display of "novelty" or "quirky" species may add character to a site by providing unusual or contrasting colour, form, and flower so long as they are suited to the site conditions.

1.8.5 Council acknowledges that some urban parks may have potential to contribute to ecological connectivity.

### Objective 1.9: Knowledge

Improve Council's knowledge of the vegetation, particularly trees, in urban parks and use it in master plans.

1.9.1 Survey specimen trees in sports grounds, cemeteries, reserves and horticultural parks by December 2012 to use as a base for reserve management planning and site development and to inform the HCC Parks and Reserves Asset Management Plan.

1.9.2 Map the survey results and use the initial tree surveys as the base for 5 yearly inspections and reporting.

### Objective 1.10: Management

Use recognised arboricultural methods and industry best practice to manage trees in Hutt City's urban parks.

1.10.1 Council will review the 1994 Tree Maintenance Policy in 2011[1].

1.10.2 Council will emphasise excellent site selection/preparation, species selection, planting, inspection, maintenance and early tree care.

1.10.3 Council will consider protecting outstanding individual specimen trees in urban parks as part of any plan change to Chapter 14G of the District Plan – City of Lower Hutt.

1.10.4 Council (cooperating with Greater Wellington Regional Council) will control pest plants and pest animals to acceptable levels citywide and to levels that exceed acceptable standards in areas with high biodiversity values. Chemical pest control may be used. Potential and emerging pest plant threats will be managed prudently. Note that this policy is not limited to urban parks. It is relevant to natural areas, street trees and road reserves.

1.10.5 As non-local native plant species may interfere with local ecology through hybridisation or weediness, Council will take a cautious approach to plant selection to limit negative effects caused by new Council plantings. Council will continue to cooperate with GW and other land managers to administer this policy.

[1] The 1994 Tree Maintenance Policy was reviewed in 2010 and 2011 and on 26 July 2011 Council resolved to retire it. The Urban Forest Plan now guides tree planning and management in urban parks.

# VISION 3: STREET TREES

Hutt City will have good quality street trees which are valued by the community, are well managed and enhance the perception of relaxed, green, leafy suburbs and well treed streetscapes

### Objective 1.11: Quality

Council will improve the overall health, attraction, life expectancy, size and form of the street trees asset citywide.

1.11.1 Council will emphasise excellent site selection/preparation, species selection, planting, inspection, maintenance and early tree care.

1.11.2 Council will emphasise creating or restoring continuity of appropriate species along streets, or sections of streets.

1.11.3 Council will identify icon species in each ward or suburb and create more distinction between streets by using a more balanced range of high performing species in a coordinated way over the long term.

1.11.4 Council will establish criteria for features such as berms and service layout in new streets where trees are required.

1.11.5 Council recognises that poor quality trees are a liability and contribute negatively to the streetscape.

### Objective 1.12: Community

Council values the contribution made by quality street trees and will encourage and enable others to do the same.

1.12.1 Council will develop street tree master plans based on Ward Themes set for each Ward in the City. The street tree master planning process will provide the primary opportunity for the public to participate in street tree planning and will respond to the aspirations of local communities where these fall within the provisions of the Urban Forest Plan. The electrical lines provider (currently Wellington Electricity Lines Ltd), HCC Road and Traffic Division will be encouraged to participate in this planning.

1.12.2 Community Committees/Community Boards, alongside Council officers, will be required to adopt conceptual ward themes for street trees in accordance with the Visions and Objectives of the Urban Forest Plan.

1.12.3 Where similarly good tree management options exist consultation may be carried out in a street. Where one option satisfies the objectives of the Urban Forest Plan to a higher degree notification shall be provided to residents.

1.12.4 Council will consider the effect of shade and leaf litter when planning for new street trees, accepting that the benefits of well located and selected specimen trees outweigh the drawbacks. Future requirements to reduce unacceptable levels of shading by pruning will be limited or avoided by thorough planning.

1.12.5 Council will provide opportunities for the public to learn about the benefits street trees generate and to participate in some street tree decision making at ward and street levels.

1.12.6 In the street tree master planning process Council will investigate a “Trees for Neighbours” scheme in areas where street tree provision is constrained and where there are worthwhile opportunities on private properties.

1.12.7 Council will look at opportunities to include additional Notable Trees in the District Plan.

1.12.8 Council will review the 1994Tree Maintenance Policy in 2011. *This was completed in 2011 and Council resolved to replace the Tree Maintenance Policy with the Operational Guide to the Urban Forest Plan.*

1.12.9 Council will develop material for its website to assist local private property owners with vegetation choices.

### Objective 1.13: Well Managed

The city will be provided with street trees which are well managed and represent good value for money over the long term.

1.13.1 Council will comply with the requirements of the Electricity (hazards from trees) Regulations 2003.

1.13.2 Street trees will be managed in accordance with the provisions of the Urban Forest Plan.

1.13.3 Whereas they provide significant benefits, Council recognises that street trees sometimes damage infrastructure and private property. They sometimes irritate residents. Council will deal with these situations on a case by case basis, within practical limitations, giving particular consideration to the streetscape from a public perspective rather than the perspectives of individual residents.

1.13.4 Council will use the 2008/09 street tree survey as a base for 5 yearly surveying and reporting.

1.13.5 Council accepts that trees which fail to thrive or will require ongoing heavy pruning are candidates for remedial attention or removal. This may include removal of undesirable vegetation planted on berms by private property owners.

1.13.6 Emergency work on street trees will not require consultation or notification.

1.13.7 Council will adopt new street tree standards in the HCC Parks and Reserves Asset management Plan. Heavy crown reduction (topping) not desirable but is an option for short term management of street trees in special circumstances.

1.13.8 Council and the incumbent contractor will jointly review the tree contract, looking for opportunities to align operations more closely with the visions and objectives of the Urban Forest Plan

1.13.9 Officers will investigate and recommend adopting recognised arboricultural industry software to assist with planning and managing the street tree asset. Other organisations and tree contractors will be involved with this work.

1.13.10 Professional advice from the electrical lines provider (currently Wellington Electricity Lines Ltd), the tree contractor, engineers, an arborist, landscape architect and ecologist will be necessary to guide Council officers' recommendations from time to time.

1.13.11 Council will employ a City Arborist with a citywide strategic planning and management focus on street trees and urban parks from July 2010. The Arborist will commence street tree planning in 2010/2011 – 2 wards to receive Ward Theme plans annually, commencing with the Central Ward.

1.13.12 Council will establish a close and positive working relationship with Wellington Electricity and their contractors.

### Objective 1.14: Green, Leafy Suburbs

To provide street trees which contribute to suburban areas which are perceived as green and leafy, within the bounds of good industry practice.

1.14.1 By 2050 Council's streetscapes will be greatly improved, particularly those where pedestrian and cycle experiences are being encouraged.

1.14.2 Council prioritises a good quality display of green evergreen and deciduous foliage with appropriate typical or "natural" forms for the species as well as appropriate scale and good long term health without unreasonable maintenance requirements.

1.14.3 Council recognises that native species and local-native species reinforce local identity and support local ecology.

1.14.4 Council prioritises street trees where a good fit with other components of the streetscape can be achieved in a straightforward way. An absence of trees is appropriate in some locations.

1.14.5 Classic horticultural and landscape design principles will guide the development of the street tree master plan alongside requirements for road safety.

1.14.6 In the interest of retaining quality street trees, Council will work with willing neighbours to look at options for relocating services. This may involve cost sharing. The cost of this work implies that relocating services will only be a realistic option in special circumstances.

1.14.7 The street tree asset will be managed on a citywide basis, in accordance with the principles of asset management, with regard for specific issues that may be experienced locally. Approximate target numbers of trees per dwelling will be considered during street tree master planning.

# Stocktake

In Hutt City, trees and vegetation growing on public open space provide the majority of the City's urban forest. The main contributors are the Department of Conservation, Greater Wellington Regional Council and Hutt City Council. The bulk of the forest is within natural areas, beyond suburban development, and consists of mixed broadleaf/podocarp forest varying from regenerating scrub to mature forest.

Greater Wellington and the Department of Conservation make a significant contribution in other parts of the region/conservancy. Hutt City also benefits from the well vegetated areas in neighbouring territorial local authorities.

| Natural Areas | Trees in urban parks | Street Trees | Notable Trees |
|---|---|---|---|
| 4950ha owned or managed by HCC<br>2900ha managed by HCC | 2725 trees in reserves<br>sports grounds, cemeteries and horticultural parks trees quantity unknown at this stage | 12,106 street trees in total. Of these, 7,000 require removal by 2030.<br>47% growing under lines<br>Currently 17% require heavy ongoing pruning to clear lines | 105, on 53 sites |

# Vision for Hutt City

Hutt City's urban forest is vast and complex. This plan concentrates on vegetation within the urban forest. Producing a plan to guide its management is a massive and complex task. Information required to refine this document further will become available in the future, giving the section on natural areas more substance. Although officers hoped this plan would provide many solutions to issues involved in managing the urban forest, a great number of new queries have emerged. This plan will need to be revised if it is to remain useful to the community, Hutt City Council officers and our elected members.

## Overall Vision

A city which values the benefits created by quality urban forest components and strives to enhance and protect these for the long term benefit of flora, fauna and residents.

A flourishing urban forest, with a range of thriving species that are well suited to local conditions and site requirements, well managed in a sustainable and affordable way for long term benefits

## Natural areas

A connected web of natural areas at a large scale, with (primarily) ecological motives and a focus on a high level of ecosystem diversity which will support high species diversity and long term health

Treat Council's existing natural areas and the native habitats they contain as part of the foundation for contributing to the City's ecology (DoC and GW's estates being the other key parts)

Enhance natural areas to encourage sustainable structural and species diversity in natural areas, which replicate pre-European habitats and ecology in the long term

Work on a large scale, considering city-wide and regional factors

Enhance worthwhile, continuous multiple connections between existing natural areas

Avoid fragmentation of natural areas

Improve the native habitat condition and ecological condition of natural areas

Work with other public and private landowners to improve and sustain native habitat and ecology

## Urban parks

- Large tree species (exotic, native and locally native) which will make an outstanding and magnificent contribution to the local landscape, without creating unreasonable interference with the recreational requirements of the site which are valued by local residents

## Street trees

- High quality* street trees valued by the community which are well managed and require relatively modest cost or intervention to maintain and retain for the long term – primarily to enhance the perception of green, leafy suburbs

  ** high quality = good health, good form and 7 to 15m height and 5 to 12m spread. Note that other trees outside these parameters are also required but in the long term the majority of street trees will be within this range*

## Notable Trees

- The concepts promoted in the Urban Forest Plan will influence the District Plan Review and Plan Changes related to Notable Trees
- Provide the City with a collection of specially valued and outstanding notable trees* that can be enjoyed by the general public, whether as individual specimens or as a treed landscape

  * relates to Chapter 14G of District Plan, particularly to trees on private property
- Recognise that trees located on private properties can partially compensate for the absence of street trees in some situations. Some private trees that contribute positively to the streetscape may warrant protection.

# Principles for the future

## Thriving, flourishing, quality, magnificent

In summary, unless good quality is likely to result the City is better off removing specimen trees or not planting specimens. It's better to forfeit quantity in favour of quality and practicality. Providing quality trees isn't a matter of good luck. If we want them we have to plan to provide and retain them.

## Big is good

Benefits of natural areas and the ecological corridors or ecological islands connecting them are maximised by working at larger scales, and benefit a larger range of native species.

## Connectivity

Multiple, continuous, wide ecological corridors are better than fragmented narrow ones. Ecological connectivity is a strong focus of the Urban Forest Plan. A diverse range of "natural" native habitats supports high species diversity – this requires space. On the flip side, habitat loss promotes species decline.

Promote existing public open space as a foundation for a large, connected web of natural areas, with (primarily) ecological motives.

## Gain more knowledge

We need to know more about the content and condition of our natural areas. For example,

> Where are the opportunities to gain most benefits from improving connectivity? (ecological, water quality, recreational, community and other)
>
> What are the best ways to accommodate natural processes in the context of the urban forest?

We need to determine a straightforward, standardised and affordable method of measuring conservation success in Natural Areas (public and private land) so that the habitats can be managed most appropriately.

We need to investigate software that will assist with management of the urban forest, especially for street trees.

Develop plans that comply with the Urban Forest Plan which provide detail design and management guidelines for street trees Community.

Making decisions about the urban forest is frequently difficult because of the emotional attachment residents have to particular sites or trees. Despite this, Council has determined that decisions about its trees will be made objectively in accordance with the principles and objectives contained in the Urban Forest Plan.

Through clear communication and consultation, residents will become aware of how the urban forest is being managed and when they are able to participate in decision making about the forest.

Promote the benefits of the urban forest and encourage private property owners to enhance the urban forest on their own property.

Provide meaningful and worthwhile opportunities for the community to participate in the planning, management and improvement of the urban forest

Trees cast shade, drop leaves and interfere with views and a “buyer beware” approach is advocated by Council. In some situations residents report that shading from Council trees is problematic. Existing trees will be managed, using a variety of methods, to balance the amenity value of the streetscape with the requirements of individual residents. New plantings will be carefully planned to limit the number and severity of shade issues Council manages in the future. Council does not prioritise maintenance of panoramic views from dwellings.

## Funding

Through the Long Term Plan and Asset Management Planning process, establish a funding programme to achieve the requirements of this plan.

Plan and manage the asset to avoid significant annual fluctuations in required funding (capital and maintenance)

In the medium and long term, neither good quality nor affordability can be achieved if we carry on with the current street tree management regime. Some trees are worth managing for the long term but many more need removal in order to generate long term benefits that achieve quality and are affordable. If we’re not more assertive about managing poor quality specimens we will continue to pay more for an asset that is declining in quality.

# Open space framework

> *"Our whole world is shaped by trees. Nearly every one of us has a connection, perhaps subliminal, with a tree or trees which may have been with us since childhood. For many of us in the 'western world' trees fulfil a decorative role. In our gardens and our public spaces we see them as living monuments of unsurpassed beauty which we hold in great affection. We feel grateful for their shade, their calming presence, their inspiration and their companionship. In the wider landscape we understand their roles as nurturers of the soil, as home to animal and insect life..."*
>
> *Petherick, 2006*

The Urban Forest and the three types of settings (natural areas, urban parks and street trees) within it, is only one part of the Open Space concept. Open Space can also include, farmland, school grounds, historical sites, church grounds, golf courses, riverside areas and private gardens. Clearly trees and vegetation are an important component of Open Space. To date New Zealand has demonstrated a preference for green open space and has not emphasised provision of "grey spaces" (open space dominated by paving, artwork, monuments and structures).

Vegetation in Hutt City's open spaces is a valued commodity, of which we believe there is good quantity, particularly the quantity of "natural" area.

Natural areas offer a variety of habitats and reflect our temperate climate, altitude, arrangement of soils, rainfall and coastal location. In summary, beech forests tend to dominate less fertile slopes with podocarps and broadleaves dominating gullies. In Hutt City naturally occurring hard and black beech can be still be found on the slopes and ridges of Stokes Valley, Naenae, Waiwhetu, the Eastern Bays and Wainuiomata. Podocarps and Broadleaves are more prevalent low in the Hutt Valley, Stokes Valley and Wainuiomata and amongst the series of gullies that make up the Western Hills (Korokoro to Kelson). Obviously the quantity of forest would have been far greater in pre-European times.

In urban and suburban areas, the urban forest is made up of a mix of native and exotic species which perform a number of roles. Trees in the streetscape are especially visible and the public's views on these trees are varied. They are mostly exotic specimen trees. Balancing the requirement for quality trees on a citywide basis with the desires of individual residents is a challenge to Council. Residents frequently request tree removal and heavy pruning in order to relieve the effects of shade cast by street trees, leaves dropped by deciduous street trees and shrinking views.

This document is primarily concerned with public open space, particularly the sites Hutt City Council is responsible for managing. The Department of Conservation and Greater Wellington Regional Council also provide significant areas of public open space locally.

# Existing policies and mechanisms

In the interest of developing a meaningful plan, that takes the interest of other agencies into account, the following documents have been considered:

**Wellington Regional Strategy, Internationally Competitive Wellington, 2007**

This document sets out three community outcomes that relate to Hutt City's urban Forest. They are:

- Healthy Environment
- Quality Lifestyle
- Sense of Place

**Greater Wellington Regional Park Network Plan**

The Network Plan sets out the direction for managing the existing regional parks and provides a framework for addressing issues common to all regional parks. Section 2, Parts A and C relate to the management of vegetation in regional parks. The vegetation in Belmont Regional Park and East Harbour Regional Park makes up a substantial proportion of native vegetation in this City.

**District Plan**

The City of Lower Hutt Operative District Plan specifically protects remnant nikau in the City – Chapter 14G1.2 "Notable Trees have been identified and protected in the District Plan. They are recognised as being of significance to the community because of their historical, cultural, botanical, recreational or visual amenity values." City of Lower Hutt Operative District Plan

"As scarce remnants of the indigenous valley floor vegetation, the few remaining nikau palms have been recognised as significant tree species in the city". City of Lower Hutt Operative District Plan

Today nikau are fashionable and are valued as a useful amenity landscape species in their own right. Many would agree that they are an iconic species in the City. The reality is that the valley floor in 2009 is vastly different from that in which these remnants established themselves. Damp areas have been drained, waterways have been contained within artificial edges, efficient drains deprive soils of water and human settlement has resulted in fragmentation of the lowland coastal forest nikau would have contributed to and benefitted from.

Until 2003 remnant kahikatea were also specifically protected by Council's District Plan. Few specimens were documented and the extent of the remnant kahikatea was unknown. Again, the forest system and ground conditions that suited kahikatea have been lost as a result of modifications that suit European settlement.

Kahikatea and nikau are large, distinctive lowland coastal forest species typical of the Hutt Valley. The reality is that these species are only the tip of the iceberg. Many other local

native plant species, plus the fauna associated with them, have suffered as a result of human settlement.

The District Plan makes provision for Council to acquire land and protect vegetation or specimen trees (native and exotic) when subdivisions are carried out, Chapter 12.2.1.

### Hutt City Environmental Sustainability Strategy

Hutt City Council's Environmental Sustainability Strategy 2009-2014 comments on the importance of biodiversity in the City and sets targets. It outlines a concern for habitat and species loss and states that there is a need for gathering more information about Council's assets that contribute to biodiversity in order to more effectively and sustainably manage these assets.

### Hutt City Council Reserves Strategic Directions 2003

The Reserves Strategic Directions document is Council's high level policy document for guiding the development and management of the City's open spaces network. The document makes a number of statements about the urban forest. The key ones being:

> "provide high quality park facilities and services focussing on areas where there is greatest overall benefit for the city and its environment" – specifically refers to improving street trees and investigating greenway opportunities
>
> "recognise and preserve the essential elements of the city's landscape that give structure and contribute to its natural and cultural identity" – specifically refers to landscape and habitat protection and sustainability
>
> "develop stronger ties with the community to ensure more effective and efficient targeting of resources and greater ownership of reserve facilities"

### Hutt City Council Reserve Land Acquisition/Disposal Policy

This document establishes the process Council can use to review its existing reserve land and to ensure that the reserve it acquires is a vital part of the network.

### Hutt City Council Parks and Reserves Management Plan

The plan, which was updated in 2008, summarises Council's parks and reserves assets, sets out service level targets and forecasts expenditure required to maintain and develop the parks and reserves network. The plan devotes little attention to soft assets such as vegetation.

### Hutt City Council Operational Guide to the Urban Forest Plan 2011

This policy was adopted by Council in 2011. It guides day to day operational matters for street tree management and is based on the principles and objectives contained in the Urban Forest Plan. The guide emphasises the requirement to improve the overall quality of street trees citywide. It is a key document for Council officers and the contractor.

### Hutt City Council Tree Maintenance Policy 1994

This policy was reviewed in 2011 and, by way of Council resolution, was replaced with the Operational Guide to the Urban Forest Plan.

### Hutt City Council Reserve Management Plans

These plans are required by the Reserves Act 1977. In general, similar sites are grouped under one plan. The plans contain polices about managing vegetation on land Council manages as reserve.

# The Urban Forest as Taonga

Polynesian settlers arrived in New Zealand to discover unpopulated landscapes offering a rich variety of habitats. Abundant, but largely unfamiliar resources were available in the forests, waterways and around the coastline.

“In Maori tradition, the plants of Aotearoa are the children of Tanemahuta, the guardian and creator of the forests … The central concept in Maori reality is that of whakapapa ... Tane was responsible for creating all the plants, animals, birds and creatures of the forest, including people. Through the chain of creation and whakapapa, humans are intimately linked to all forms of life, including plants. These connections are embodied in the traditions, thoughts, behaviour and culture of Maori as part of their mauri, life force or essence.” Foster, 2008, Chapter 4

The forests of Aotearoa provided food and material for decoration, medical and industrial purposes, tools, containers, clothing, construction of shelters, weaving, dying and of course fuel for fires. The plant world of Aotearoa thus assumed a great importance, not just for survival, but for its role in Maori identity and culture”. Foster, 2008, Chapter 4. Harvesting of plant and animal material was governed by Maori lore and ritual.

Today Iwi are concerned about cultural and customary rights. Vegetation is an important ingredient for improving water quality and a healthy and plentiful source of kaimoana. “Tradditional uses of native plants and animals and the materials derived from them are important to maintain Maori culture and identity. When developing management systems customary use needs to be facilitated. It must take into account how we store knowledge about where resources are and how this is accessed by the Iwi with kaitakitanga over the area.” Greater Wellington Regional Parks Network Strategy

It is important that Council gains a thorough understanding of the way the Port Nicholson Block Settlement Trust and the Rununga value and use the urban forest. Their perspective is vital. Iwi recognise the land as their ancestors. “The land is mother, and therefore taonga. As the most junior of the ancestors, it is our role to respect and look after the elders which includes the forest, the rivers and the land. The extent to which we care for taonga, determines out own health. To look after Parks, which is our lifeblood, is to look after ourselves. These responsibilities as guardians (kaitiaki) include passing taonga (assets) to future generations.” Greater Wellington Regional Parks Network Strategy.

Tangata Whenua requirements for the future of the urban forest need to be considered. This may include harvesting resources, site improvements, species of special significance plus Maori involvement and influence in decision making related to the urban forest. Maori also see naming and interpretation as useful ways to educate and ensure Maori heritage is retained.

# The Urban Forest as a critical public investment

"… our forests look and feel special. They constitute a unique experience we cannot replicate elsewhere". Dawson and Lucas 2004.

In addition to their importance to Maori, some native plants have global importance because they act as remnants of ancient plant species that are extinct in the rest of the world.

"Of our 2500 native species of conifers, flowering plants and ferns, over 80% occur nowhere else in the world; our forests have evolved in complete isolation for many millions of years; they contain animals unique to New Zealand alone". Dawson and Lucas 2004

## Asset management

> *"Local Authorities manage significant infrastructural and community assets that are the means by which they deliver most of their critical quality-of-life services to their communities. It is essential that Local Authorities clearly demonstrate the intended use of assets to enable communities to see what services will be provided if those plans are implemented."*
>
> *Office of Auditor General, New Zealand*

Asset management planning involves collecting, analysing and reporting data on the utilisation, performance, lifecycle management and funding of assets. The idea is that physical works become more predictable and costs can be allocated at the right time. Council's LTCCP and the Parks and Gardens Asset Management Plan are geared to match community outcomes and levels of service. Typically New Zealand local authorities do not prioritise asset management planning for soft assets such as trees and forest. Historically the Urban Forest has not been a focus in the Parks and Gardens Asset Management Plan, primarily because there has been little data about quantity and condition. Information collected for this plan will improve this situation out of sight for Hutt City Council. A lifespan can be established with some accuracy, providing a base for a programme of new and replacement plantings. In natural areas more knowledge about the condition of the urban forest would help to target maintenance and restoration efforts.

Council's vegetation in open spaces is not capitalised or depreciated.

Surveying carried out as part of this plan in 2008 and 2009 has revealed some concerning statistics that will require tough asset management decisions to be made. For example, the fact that 47% of our street trees are growing under overhead lines (and are continuing to be planted under lines) is going to result in a significant increase to the cost of Council's Contract for Care and Maintenance of Street and Notable Trees by 2030. Under an Asset Management planning approach, works can be planned to gradually address the current forecast of rising costs and decreasing street tree quality.

The current street tree maintenance regime will become unaffordable. Over the next 20 years costs will increase as additional trees require line clearance and tree quality will decrease overall unless there is some change.

The objectives and policies in this Urban Forest Plan emphasise the Mayor and Councillors' desire for the City to benefit from a professional, whole street approach based on asset management planning principles.

As the city gradually expands in terms of population and the urban footprint, changes in the urban forest occur. Increasing population density results in increasing requirement for open space, of which trees are usually an important component. Urban forest planning provides a framework for conservation and development, engages key partners and stakeholders. "Green infrastructure is designed and planned as a critical public investment before development occurs". Erickson pg 38. This Urban Forest Plan is the Parks and Gardens Division's first attempt to look at the urban forest component of Council's open space planning more seriously. In time it will involve protection of open space based on a systematic evaluation of land-use decisions, particularly in areas of more rapid and intense urban growth. The Division will consider land development, built infrastructure planning, conservation values and conventional open space considerations, using existing Council policies such as the Reserves Acquisitions and Disposal Policy and the Reserves Strategic Directions plus the final version of this Urban Forest Plan. Special consideration will be given to vegetated or regenerating vegetation in areas where infill housing and greenfield development is most likely to occur. Note that achievements will rely on willing developers and surveyors as well as Council's desires.

As the City develops, the density will intensify. Population forecasts indicate that Avalon East, Epuni West and Waterloo West will be our most densely populated areas by 2031. While this density will be modest compared to many other cities internationally, is still necessary to consider how Council should respond in terms of public open space.

The membrane between natural areas and the edge of the urban areas will face increasing pressure. Without clear policy and strategic management, natural areas are likely to retreat. This is not desirable.

The Hutt City Council values the beauty and uniqueness of the New Zealand forest; the local native ecosystems, habitats and species. This is demonstrated by the comprehensive open space network pieced together by this Council and its predecessors. The legacy we have been handed is precious. With minor additions and alterations and good planning and maintenance it will continue to provide great benefit to the community (human and non-human).

# The Urban Forest as a functional network

Hutt City Council seeks an open space network that, like intricate puzzles, creates a whole that is greater than its parts.

Hutt City's open spaces must offer more than just space which is free of buildings. Acquiring, protecting, designing and managing open space that enhances ecology, soil conservation, water quality, a variety of habitats, recreation opportunities, cultural opportunities and amenity values is a tall order!

Council recognises that trees and vegetation offer far more than amenity value. Trees assist with mitigating storm water. Human health depends on the natural world and biodiversity. An array of essential services are delivered by ecosystems. "These include the purification of air and water, the decomposition of wastes, the recycling of nutrients on land and in the oceans, the pollination of crops and the regulation of climate". Melillo and Sala in Chivian Our existing open space network is substantial and largely delivers what the City's human population currently requires. Of course there is room for improvement and improvements and additional acquisitions occur every year.

Council recognises that the components of the urban forest make a positive contribution to the City. The components of the Urban Forest are:

- Natural Areas
- Urban Parks - horticultural parks, sports grounds, urban reserves and cemeteries
- Street Trees
- Protected Vegetation (notable trees in District Plan and trees/vegetation protected through the subdivision process)

In comparison to other New Zealand local authorities, Hutt City is responsible for a large quantity of natural area. Yes, there are some problems, but overall the urban forest is valued and valuable. Most of our natural areas are either protected by the Reserves Act 1977 or are in the process of being classified under the Act. A strategic approach will result in improved connectivity, large areas of undisturbed vegetation, native vegetation along watercourses, heterogeneous and well distributed natural areas and more locally native vegetation in the headwaters of catchments. Council can action some of these items. Council can progress others by advocating and influence others.

There are two big issues for street trees. A lack of quality specimens and lack of a professional, citywide asset management focus. Results of the 2008/09 street tree survey indicate that only 10% of street trees could be considered quality specimens and 60% of the total street tree stock need to be removed by 2030 because they will not develop into quality specimens.

The existing mix of street trees contains several species that do not thrive in Hutt City streets, for example Fraxinus ornus (Manna Ash), Betula Pendula (Silver Birch) and Prunus species (Flowering Cherry). To date, Council has not proactively removed poor specimens quickly enough. Not has it emphasised care of young trees.

# The Function of Vegetation in Hutt City

The City's spectrum of landscapes provides a variety of places and conditions where different kinds of forest can grow. Each landscape features its own type of forest. Clearly the character required by various components of the City's urban forest varies greatly and this influences the management of vegetation across the city's public open spaces.

| | Natural Areas | Urban Parks* | Horticultural Parks | Street Trees | Protected Trees |
|---|---|---|---|---|---|
| Chief qualities of landscapes (ideal) | Vegetation canopy dominated or expected to be dominated by local native species or regenerating local native species. Tracks are present. Generally lack buildings, roads. Beyond pest control fire mitigation and track maintenance, little maintenance and cultivation provided.<br><br>Provide habitat and food source for native fauna. Allows birds to travel and supports their breeding.<br><br>Contribute to soil conservation, air quality, carbon sequestration and water quality in catchment.<br><br>Provide an attractive bush backdrop which is associated with local identity and enhances the perception of green, leafy suburbs | Transition sites on the scale of total local native to almost total exotic. May be part of ecological corridor concept. Provide some habitat values. Moderate levels of maintenance provided with low levels of cultivation.<br>Enhancement using volunteers may be required to realise potential.<br>*includes sports grounds, urban reserves and cemeteries | Outstanding ornamental display of high quality native and exotic floral, foliage and turf features in an amenity setting.<br><br>Provides year round interest. | Rhythm, perception of regularity<br>Sense of place<br>Balance (visual)<br>Set up the perception of the street as a human orientated place rather than a vehicle dominated one | Mature or semi-mature specimen trees or clusters of trees which merit protection under the District Plan, Chapter 14G. |
| Considerations for vegetation choices | Local eco-sourced native seed grown material as first choice.<br><br>Select species that will thrive and reproduce naturally.<br><br>Include local native species will attract local native fauna. | Large specimens that cannot be hosted on 400m² lots. First choice (based on requirements such as form, shade, local conditions etc) to be local native, deferring to native or exotic as second choices – most sites will contain a mix | High levels of cultivation and maintenance acceptable, but responsible management of inputs.<br><br>Species the will thrive and display "natural" forms.<br><br>Layout and species selection need to fit with other functions of site, eg public events, playgrounds | Species and layout that provide an orderly, prominent and cultivated look, within constraints of existing services and are known to thrive in local conditions. Predominantly a display of foliage not flower. Attain heights of over 15m and achieve reasonably typical or natural forms for their species<br>Neighbouring properties. | Willing landowner, longevity, visibility to general public, level of maintenance required, rarity, contribution to streetscape, provenance or historical associations, health, form and size |

The factors listed below influence the type of vegetation best suited to particular sites:

- *Distance from coastal winds*
- *Presence and severity of frosts, ice and snow*
- *Steepness of slope*
- *Drainage*
- *Depth and Fertility of soil*
- *Rainfall*
- *State of the ecological community on site eg existing colonising species, need for habitat*
- *Likelihood of vandalism, and accidental damage by vehicles*
- *Need to cooperate with neighbours (limit shade, damage to services)*
- *Likely future development of sites*
- *Level of maintenance able to be applied*
- *Need to host specific plants ex-situ eg threatened plants propagated at Percy Scenic Reserves*
- *Existing species thriving in the local area/neighbourhood*
- *Knowledge of pre-European vegetation situation*
- *Need to establish local identity and character*
- *Fire resistance (for revegetation following gorse boundary control)*
- *Pests and diseases*
- *Likelihood of vegetation gaining status as a pest plant or spreading rapidly as an invasive weed would, therefore likely to need treatment as a weed*
- *Other constraints – overhead and underground services, designated public transport routes and over dimension routes*

The combination of factors influences the specific plants and type of forest that are likely to grow.

In natural areas “The species that find a habitat charitable, live together as a community. They must be able to survive in the habitat with other members of the community, both supporting and competing with each other in a self-sustaining community. Some members of the eco-system are vital to its survival, like beech trees in a beech forest … others may benefit from the system, but if they disappeared the system would continue to function” Cobb et al. In cultivated areas “self sustaining” is not an important consideration.

Local components of the urban forest are part of a city wide network, which in turn contribute to a larger regional or conservancy network. This approach is pragmatic given that species, ecosystems and water catchments cross territorial boundaries of Councils, particularly Upper Hutt and Hutt City.

Prior to European settlement landscapes, catchments and habitats were interconnected with species naturally found in the area. That connectivity has declined with human settlement, particularly European settlement.

Fragmentation of habitats or landscapes decreases the quantity and quality of natural areas available to native flora and fauna. Exotic Species, edge effect and increased human disturbance often result. These reduce the quality of the remaining habitat. Academic literature advises us that protecting isolated natural areas is not enough. Many, many pages of academic literature are dedicated to explaining that there must also be linkages in the

landscape to allow flora and fauna to move through human developments to areas of more suitable habitat. Connectivity is enormously important. Fortunately this City is well positioned to take up the challenge of improving connectivity between existing open spaces, particularly public ones. The primary motive for connecting open space is ecological. The second is recreational and this is covered in Council's 2009 plan "Making Tracks".

**Big is Good! We need large, interconnected open spaces at a city and region wide scale, motivated by the desire for ecological gains.**

Connectivity can enhance the population viability for species by increasing species migration rates to open spaces. It can also make additional foraging areas available and provide alternative refuges from predators and disturbances such as development, flood or fire. Connectivity opens up a wider mix of habitats (food and shelter) to species, which may have seasonal advantages.

Open-space corridors, ecological corridors, greenbelts and greenways are all terms used to generally describe the concept of connecting open spaces. It has been a hot topic for conservation planning over the past 10 years or so.

Meurk recognises that conservation depends on both ecological and socio-cultural factors.

"If people don't see something, it becomes irrelevant to them. That's been one of the problems with the polarisation of conservation of New Zealand – we relegate nature to distant mountainous national parks, which are wonderful but very remote from people." Meurk, 2011

Meurk and Hall 2006, suggest that the concept of forest patch configuration could be applied in urban areas to improve natural values. In Landcare's Urban Greening Manual, How to Put Nature into our Neighbourhoods, the idea of developing a "pattern of nested forest patches of various sizes" at 200m, 1km and 5km spacings and landscape connectivity is explained more simply. This work provides a lead for improving the value of the Urban Forest in Hutt City, particularly in natural areas and urban parks. The existing open space network provides a provides a solid starting point.

The Lower Hutt Branch of the Royal Forest and Bird Protection Society of New Zealand has developed a concept to improve connectivity between existing (large) public open spaces, using ecological corridors. A connected network of ridges, gullies and flat areas across a variety of habitats is required to achieve connectivity, Objective 1.1. This concept aligns very well with the main theme for Natural Areas in this plan, which was contemplated at a high level in Council's Reserves Strategic Directions. Council agrees that Forest and Bird's concept will be treated as the foundation for achieving connectivity. The current plan may need to be altered a little over time but the concept is sound. In summary, Forest and Bird propose:

1. Establishing connections between existing, large areas of public open space in order to gain ecological benefits. The existing sites in Hutt City which need to be linked are:
    - Belmont Regional Park
    - Hutt River corridor
    - Eastern Hills of Hutt Valley in Hutt City
    - East Harbour Regional Park, including Gollans Valley and Pencarrow Lakes

- Matiu Somes Island
- Wainuiomata Water Catchment
- Rimutaka Forest Park
  - Wainuiomata Valley
  - Turere Valley
  - Orongorongo Valley
  - Catchpool Valley

2. Establishing connections from sites within Hutt City to sites in other cities, for example:
   - Zealandia (Karori Wildlife Sanctuary)
   - Eastern Hills of Hutt Valley in Upper Hutt City
   - Pauatahanui Inlet
   - Otari Wilton Bush
   - Porirua Scenic Reserve
   - Redwood Bush in Tawa
   - Spicer Forest in Wellington City
   - Trelissick Park
   - Mirimar Penninsula
   - Outer Greenbelt in Wellington City

3. Legal Protection for ecological corridors

Council favours Reserves Act 1977 classification as the mechanism for protecting its reserve land. Other options are available to private property owners, for example Queen Elizabeth II National Trust open space covenants.

The resource consent process associated with subdivision provides Council with opportunities to acquire or protect areas of privately owned land and specimen trees. This is guided by the District Plan and the Resource Management Act.


Image provided by Lower Hutt Branch of RF&BPSNZ

Solid Green ribbons indicate conceptual connections (proposed)

Further to these points, Council acknowledges that there is opportunity to involve key private landowners in this scheme voluntarily to improve connectivity. Even greater benefits could be achieved in the long term if neighbouring territorial authorities adopted a similar proposal.

> *"There were an enormous number of waterfowl frequenting the shallows at the mouth of the river; cormorants, ducks, oyster catchers, plovers, sandpipers, curlew and red legged waders."*
>
> Charles Heaphy – surveyor 1847

Riparian ecosystems and landscapes are particularly important for both conservation and human use. Riparian areas in their natural states contain running water, moist and fertile soils and are associated with well developed vegetation in a dynamic environment. Riparian and wetland vegetation is vital to aquatic and terrestrial wildlife, which is typically most abundant and diverse in these habitats. Specialised flora and fauna are present in riparian and wetland areas.

Riparian and wetland area ideals:

- intercept materials, organic debris and nutrients from upstream
- moderate flow and influence water availability and magnitude of floods
- streamside vegetation slows water and reduces erosion
- streamside vegetation shades water and moderates temperature
- provide specialised habitats
- are attractive for human uses, disposal, watering stock, recreation

The territory described as Hutt City contained abundant and thriving waterways and wetlands prior to European settlement. Because riparian areas are attractive, human use often extends to the edge of streams and rivers. Historically the value of wetland has been overlooked and their values have been overridden by more important values such as creation of pasture or urban development. Sadly little remains of these natural riparian areas and wetlands and very little of what does remain is in good condition, facing a healthy future. Remnants of natural riparian or wetland habitats are usually fragmented, which diminishes their function.

These days, wetlands are seen as important habitats and conserving remaining wetlands is considered noble. In terms of the Urban Forest Plan, riparian areas warrant special consideration as a high priority for protection and restoration. Clearly upland vegetation and activities contribute to the survival (or demise) of riparian areas and these need to be considered as part of the riparian and wetland systems. The Waiwhetu Stream and Pencarrow Lakes are local examples of fragmented, modified areas which would benefit from restoration of their catchments.

# Profile and challenges of Hutt City's Urban Forest

New Zealand spans a broad range of latitudes and the nation's habitats, incorporate sub-Antarctic to tropical vegetation. Hutt City sits within the Wellington Conservancy area of the New Zealand Botanic Region. There is great variety of native ecosystems and habitats in the Conservancy and in our own city. Of the greatest interest to Council are gravel beaches, coastal rocky shores, lowland coastal forest, lowland wetlands and grey shrub communities. The vegetation types associated with these habitats are varied. Unfortunately many of these habitats are in poor condition.

Habitat loss → Species decline → Species loss

Across our City variations in topography, soils plus exposure to wind, sunlight and salt have affected the distribution of species, resulting in a variety of ecosystems. Clearly in post European times species distribution is also affected by human development, pests, grazing and possibly climate change.

**Hutt City facts**

| | |
|---|---|
| Wellington region | 8,140 km$^2$ or 813,005 hectares |
| Wellington conservancy | In the Wellington Conservancy the Department manages 184,000 ha administered as 322 separate land units, and one marine reserve. Only 2167 ha is held in marine reserve, with the balance (approx 182,000 ha) in land.<br>The largest areas are held as Conservation Parks (151,736 ha). |
| HCC territory | - Territorial 377 km$^2$ (37,700 ha)<br>- Urban 135 km$^2$ (13,500 ha)<br>37,998 ha. In total |
| Average rainfall | 1450 mm p.a.<br>Between 1350-1450 |
| Lat and long | 41.°S, 174.9 °E |
| Mean daily temperature | Jan = 21°C<br>July = 11°C |
| Sunshine hours | 1,900 – 2,000 hours of sunshine per year |
| Wind: | Predominant wind 50% of the time is from between the north and west –30% of the time it is from between the southeast and southwest.<br>Gustiness is a feature of storms. |

Hutt City's climate is described as temperate and is strongly influenced by our coastal surroundings.

A few local sites are representative of pre-European vegetation but a far greater number have been modified or degraded. Many are recovering from damage decades ago and are revegetating "naturally". Some of these forests contain habitats that are threatened and/or species that are threatened.

Hebe speciosa and Euphorbia glauca are a local natives frequently used in Council's coastal reserve plantings. Today, neither of these species survives locally in their preferred habitat naturally today. These species do well locally in amenity plantings and they contribute to our local character in a visual way.

The current commitment to threatened species and the interesting use of natives species in amenity plantings is largely an extension of Petone Borough Council interest in coastal species and work being carried out by Percy Scenic Reserve from the early 1980s through to local government amalgamation in 1989.

> *"Although coastal plants are hardy, over one third of Wellington's recently extinct species are plants of the coastal cliffs and beaches. Rabbits have contributed to their demise…A more recent threat to cliff plants has been the liberation of goats by coastal landowners …The depletion of palatable plants has accelerated and has been accompanied by erosion…One of the reasons so many of Wellington's coastal plants have fared so badly this century is that many of them have quite specific habitat preferences. Consolidate the loose shingle beaches and you lose the plants adapted for just those conditions. Build sea walls and you remove the means for creeping dune plants to spread along the foreshore."*
>
> Gabites,1993

# National contribution

**Percy Scenic Reserve**

Council has made a special commitment to local and national biodiversity at Percy Scenic Reserve, where the recovery, propagation and cultivation of threatened plant species are important operational functions.

Percy Scenic Reserve plays an important role in averting extinctions of plant species. Percy staff have been responsible for assisting the Department of Conservation with propagation and ex-situ cultivation of threatened plants from several conservancies in New Zealand. Percy Scenic Reserve holds a nationally significant potted alpine plant collection plus plant collections from various geographic areas of New Zealand. Some threatened species feature in these collections.

Percy Scenic Reserve holds and propagates a range of threatened species from various offshore islands. This represents a contribution to national biodiversity. It is a privilege for our City to work with the Department of Conservation and return these species to the wild in higher numbers. Normally a number of specimens will be held by Council, at Percy's or in other cultivated areas, as insurance against something disastrous happening to the wild, off shore population. Given the high levels of endemism, particularly for the sub Antarctic islands, this service demonstrates that Hutt City is making a global biodiversity contribution.

The Reserve Management Plan for Percy Scenic Reserve and Jubilee Park states that Council wishes the native botanical collections at Percy Scenic Reserve to be nationally significant.

The original Percy Scenic Reserve property, 1906, is one of New Zealand's first Scenic Reserves. The site has been extended by reservation of additional properties. Although we

got started early in our City, it wasn't really until the 1970's that the conservation movement began to convince the community that New Zealand's vegetation and habitats were special and their requirements needed to be balanced with urban development, farming operations, timber harvesting, draining and dumping. In Hutt City we've embraced the need for balance and we're now working towards environmental sustainability. We need to align the urban forest with current best practice for local authority asset management planning. This will be possible as more data about our forest assets is gathered and analysed. The current state of the street tree data represents a significant milestone.

## Regional contribution

Components of Council's existing open space network are part of a citywide network, which in turn, contributes to a larger regional network. Because species, ecosystems and water catchments cross territorial boundaries, Council is keen to work cooperatively with neighbouring local authorities and other land owners to provide webs of connected or closely spaced open space primarily motivated by the desire for ecological gain and habitat enhancement.

Hutt City Council works with Greater Wellington the Regional Council to enhance the ecological and recreational values and benefits of East Harbour Regional Park and Belmont Regional Park. Council is willing to 'trade' reserve land to ensure that properties are managed by the most appropriate agency. For example, ribbons of land surrounding the Pencarrow Lakes were owned by Council but have been handed to the Department of Conservation who have expertise in managing these sites and were already responsible for the interior of the Lakes.

Hutt City Council participates in the Open Spaces Workshop forum of the Wellington Regional. This group is involved in the coordination of open space at a regional scale.

## What was here

European explorers and settlers "with their background of deciduous oaks and beeches and evergreen pines, the New Zealand forest came as a complete surprise, appearing to them to be more tropical than temperate in character." Dawson and Lucas pg 7. Among the numerous individuals whose diaries, letters and reminiscences of 1840 to 1841 have been researched the common denominator in them was the reference to the vegetation of the valley.

> *"The grandeur of the forest which overshadowed these clear creeks, the luxuriance and entanglement of the underwood and the apparent richness of the soil, could nowhere be exceeded."*
>
> Jerningham Wakefield describing the Hutt Valley 1839

> *"The Hutt River was a narrow deep channel lined to its edge with kahikatea … many 75 feet to the first branch."*
>
> Ernst Dieffenbach 1843

> *"The forests were teeming with birds: tui, fly catcher, wren, sand lark, robin, bell bird, tit mouse, thrush, popkaea, riroriro, kokako, pukeko, pigeon, kaka, huia, bittern and weka".*

Charles Heaphy – surveyor 1847

*"Wood commenced about a mile from the sea, the intervening space being sandy flat with flax marsh."*

Charles Heaphy – surveyor 1847

In 1846 when Colonel Godfrey Mundy visited and later described his journey up the Hutt Valley, the forest was still impressive. "Right and left to a distance of fifty or sixty feet," he wrote while travelling up the Hutt Road, "the timber had been felled, and beyond this rolls the tall, tangled and impervious forest. Many of the trees were of majestic growth, and several – among others, the Kahikatera (kahikatea) – are very valuable as timber, for hard and durable qualities." (source unknown)

In one instance it is recorded that: "Brees (that is S.C. Brees) records that in 1847 there was a rata tree on a hilltop near the Hutt 56 feet in circumference …This is indicative of the great age of the forest which once covered the Valley." Hall, 1940

The two main types of forest present in our City were podocarp/broadleaf forest – mostly rimu, tawa on the Western Hills; with beech, both hard and black, on the eastern slopes and spurs. Kahikatea, tawa and totara were found on alluvial flats and black beech, tawa on the redeposited and alluvial terraces. Paraphrased from Bruce, 1957. Beech was present on the Eastern side of the harbour and on the slopes surrounding the swampy Wainuiomata Valley.

The vegetation scene in the Hutt Valley, Wainuiomata Valley and coastline of Wellington Harbour has altered massively since the arrival of European settlers.

**Cook Strait**

Note that the southern area of the City is influenced by coastal conditions, particularly salt laden winds associated with Cook Strait.

*"Windiness, combined with moderately high sunshine hours, also gives Wellington quite a high evaporation rate compared with the rest of the North Island. Coastal plants are constantly buffeted, but they are hardy enough. Springy divaricating shrubs, thick leaved taupata and tauhinu, flax and gorse dominate the fringes of Cook Strait,"*

*Gabites, 1993 pg 15*

"A particular feature of Wellington's vegetation is that high altitude species can be found on exposed coasts" Gabites pg 76. Gabites gives specific examples including: mountain flax (*Phormium cookianum*), Spaniard (A*ciphylla sqarossa*), woollyhead (Craspedia) and scabweed.

Our native plants are vulnerable to browsing by mammals, having evolved in isolation from them. As a result of browsing, habitat loss and modification following sand and gravel extraction and grazing by stock and pest animals, specialised coastal species such as sand coprosma (*Coprosma acerosa*) are scarce or lost in their natural habitats.

Today, Council allows the northern few kilometres of the Pencarrow Coast Road, gravel beach and escarpments to be grazed. Feral goats are also a problem in this area. This

threatens the survival or return of some native species. Gravel is harvested commercially from Fitzroy Bay.

Fire is a significant threat to our natural areas. Unlike some Australian or North American forests, New Zealand forests do not benefit from fire to stimulate habitat regeneration. Fire is not a natural component of the cycles in our local ecosystems. It is not considered necessary to manage the build up of fuels in native forests.

**Hybrids**

Breeding between species results in hybrids. Dawson and others recognise "natural hybridism as a feature of the New Zealand flora, in many cases involving species of widely different ecology".

Hybridising also occurs between local native species and non-local native species and cultivars. Sawyer and de Lange, in Spellerberg, discuss indiscriminate planting of pohutukawa and state that "If not contained, this will soon seriously alter the purity of these stands of northern rata. Around Wellington Harbour, hybrids may pose a **t**hreat to the long term survival of northern rate. This is because northern rata has already been reduced to small relict populations in this area, as a consequence of human settlement." Use of horticultural varieties and cultivars in other species such as kowhai, manuka may become problematic for Council as it attempts to replicate pre-European vegetation in natural areas, where it is practical. The issue is that a risk to endemic flora translates as a risk to local ecology and biodiversity. The extent of this hybridising problem has not been assessed in Hutt City to date. The practicalities of managing this problem (if warranted) would be complex.

# History of clearance

> *"Although initial impressions of the southern coast from Cook's ship Resolution in 1773 had been of "dreary, blackish, barren mountains, of a great height, almost wholly destitute of woods and shrubs…', the first Europeans to venture within the harbour found hillsides heavy with forest and fine stands of rimu, kahikatea, totara and pukatea extending as far as they could see up the Hutt Valley… Almost immediately it was attacked with axe and match".*
>
> Gabites, 1993 pg 10

Forests of New Zealand were cleared for two primary reasons:

1. to fell timber and sell it (domestic and export markets) commercially

2. to open up land for farming and settlement by clear felling and burning.

Following the settlement of Maori around 1300AD and Europeans around 1770AD, New Zealand's vegetation and ecosystems have been modified and greatly reduced, firstly by fire and introduced animals, and later also by timber extraction and land clearing (primarily for agriculture).

Gabites pg 51 speculates that many emergent mature canopy specimens, such as kahikatea, matai, miro, totara and rimu "would have been 800 years old when European Settlers first cast their timber- hungry eyes over them."

European settlement from say 1825, involved the establishment of farms. In general, it appears that the bush was seen as an obstacle which needed to be overcome. Most settlers had a British background and battled the New Zealand bush to create pasture reminiscent of centuries old English farmland in order to support lifestyles they were familiar with at home.

> *"Europeans first imagined New Zealand as "a garden and a pasture in which the best elements of British society might grow into an ideal nation'".*
>
> Park,1995

Settlement in the Hutt Valley involved timber extraction, road building, drainage, flood control, importation of cattle, development of grazing land and new towns and later industrial activity and reclamation, as well as quarrying and landfills.

Further attempts to recreate European conditions resulted in importation of deer, rabbits and possums, which quickly became pests. Like deer, exotic plants were also imported and this Council has been ungrateful for the settlers' contributions of gorse, blackberry and later Darwin's barberry, snake feather, sycamore and old man's beard.

Today, nationally, native forest covers around 23% of total land area. Keep this in perspective. We're relatively well off ion Hutt City. Other local authorities have such a low proportion of native forest we'd almost consider them deprived.

The bulk of forest clearance in New Zealand was accomplished between 1850 and 1900 in remote areas, difficult conditions and without machines. Gabites, 1993 explains that "settlement and forest clearance spread more or less at the same rate as roading. The Hutt Valley forests were felled early on in New Zealand colonial timber industry history. "The road up the Hutt Valley had reached Taita by 1843 and Upper Hutt a year later". Gabites, 1993 "Maori land-owners in the Porirua Basin and the Hutt Valley reluctant to part with their land were alienated by military action 1846." Gabites, 1993 This enabled dense native forest to be cleared and converted to pasture.

Unfortunately since the impressive forest in the Hutt Valley offered "the most lucrative timbers, on the easiest and most fertile land, they were first to be felled." Gabites, 1993 In the urban area of our City the remnants of this forest are gone. Bartons Bush in Upper Hutt is really the only sample of publicly accessible pre-European podocarp/broadleaf forest left in the Hutt Valley. The Wainuiomata Water catchment, which is not normally available to the general public, "is still a splendid stand of podocarp/broadleaved forest". Gabites,1993.

Lower in the Hutt Valley, the 1855 earthquake uplifted land as a result of movement along the Wairarapa fault and assisted the settlers attempting to drain land.

> *"By 1870 most of the forest in the Hutt Valley had been cleared from flat land. The railway was put through a few years later and any remaining totara was used for the posts and fence rails either side of the line".*
>
> Gabites,1993

By 1900 most of the land on the Wellington Peninsula and Hutt Valley was being grazed.

> *"So, in thirty energetic years, Wellington's new inhabitants, charged with the zeal and fervour of establishing a new life in the colonies, had recreated a brave little English landscape."*
>
> Gabites,1993

One of New Zealand's first Scenic Reserves was established in 1906 - part of Percy Scenic Reserve.

Once vegetation had been stripped from the Hutt Valley and its hillsides "the Hutt River shallowed and widened and flooding became more frequent. Commercial development of the valley proceeded only after expensive river control measures." Gabites, 1993 Managed exotic forestry was introduced to Wellington's Town belt between 1922 and 144 as well as significant number as pohutukawa along streets and coastlines. Presumably earlier residents thought this was such a good idea and replicated in what is now Hutt City. Council records indicate that pohutukawa were planted in Cuba Street, Alicetown for amenity purposes in 1913.

By the late 1920s (and later) exotic plantations were established on public land in our City, for example, Galbraiths Gully, Ferry Road and Sunny Grove. These were poorly managed by the local authorities and have been or will be felled leaving a wake of community frustration and inadequate income to cover the cost of harvest and revegetating sites.

Until the mid 1980s gorse and scrub fires occurred frequently on the Eastern Hills. In the last 10 years the number and severity of scrub fires has reduced markedly.

With little assistance beyond fire mitigation and pest plant and animal control, native revegetation is occurring naturally and is making good progress. Most gullies are filled with scrub and in some a native canopy has formed. Where gorse forms the canopy, there appear to be good quantities of native seedlings below although hard and black beech (Nothofagus truncata and N. solandri) may be under represented. Transformation from gorse, to native scrub to secondary growth and eventually to mature canopy species and emergents will steadily occur so long as land is protected from development, pests are managed and fire is mitigated and minimised by rapid intervention.

# Natural Areas

## Benefits of natural areas

> *"The protection and design of open space is increasingly critical for human health, environmental integrity, and community cohesion … ".*
>
> Erickson

In Hutt City the natural areas within our Urban Forest are a valued, and valuable asset. They are a vital component of the City's open space network which provides abundant benefits to our community. Benefits generated by natural areas include:

- Provide a range of habitats and host various mosses, ferns, lichens, fungi, invertebrates, microbes, birds, insects, frogs and bats
- Contribute significantly to air quality, water quality and viability of catchments
- Aid retention of water in catchments and assist in moderating peak and low flows
- Aid soil conservation and are the source of some soil components
- Provide a barrier to urban sprawl, defining the extent of urban areas
- Contribute to connectivity by acting as a green corridor or an ecological corridor, allowing species to move across the landscape, a connected series of public open spaces is better than fragmented or isolated sites
- Can function as a venue for a mix of activities, including conservation, recreation, cultural
- Provide scenic vistas and are attractive in their own rights – functionality aside
- Contribute to ecology and environmental processes outside the City's territorial boundary, including carbon sequestration

### Forests as a carbon sink

Plants capture approximately 5% of the solar energy that reaches the Earth and use photosynthesis to supply all the energy supporting life on Earth.

> *"When trees or animals die, the processes of decay attack and decompose what was once living matter, returning to the air and soil all of the elements from which they were made. These are all carbon-based life forms and the cycling of carbon in the environment is of worldwide significance. Forests lock up vast quantities of carbon in their living structures."*
>
> Cobb

Council's Environmental Sustainability Strategy, B13 on page 19, commits Council to investigating "the emissions trading scheme, its implications, and the biodiversity and financial implications it presents Council, with the intention that any revenue be applied to biodiversity initiatives". The government carbon emission trading scheme relates to the Kyoto Protocol and may be of interest to Council. Council is responsible for very little exotic forestry. There may be an opportunity to participate in the scheme, using our native forest areas. This will be determined when the Ministry for the Environment releases their Land Use and Carbon Analysis System (LUCAS study).

**Values of some forests in Hutt City**

The Wainuiomata Catchment in the Wainuiomata/Orongorongo Water Collection Area is considered one of the most ecologically important ecosystems in the region. It contains the largest area of original, unlogged Podocarp forest in the lower North Island and is the type of lowland forest that would have been seen in the Hutt Valley prior to European settlement. There is now a mainland island project underway in the area, where intensive pest control has been applied over 1,200ha since 2005. A native robin release is proposed for the site n autumn 2010.

The forest in the Eastbourne Hills contains one of the richest orchid floras for any area of equivalent size in the Wellington Region – 33 species have been recorded to date. The forest is also home to the largest stand of terrestrial northern rata in the region (the majority of northern rata in the Rimutaka and Tararua Ranges are epiphytic). A 350ha mainland island site has been in place since 2006 and robins were released into the area in April 2008. The care group MIRO is the main driver of this project. They are supported by Greater Wellington Regional Council.

Korokoro Bush is another important area ecologically. It contains the only large stand of rimu-rata/tawa-kohekohe forest in the southwest of the Wellington region. The care group, Korokoro Environmental Group (KEG), has recently started monitoring rats in the area to check the effectiveness of the current pest control regime.

In Natural Areas Hutt City's urban forest communities include:

| Forest Type | Habitat | Example of local site | Dominant canopy species | Key native colonising species |
|---|---|---|---|---|
| Coastal Vegetation | Gravel/Shingle Beaches | Fitzroy Bay | Disphyma<br>*Muehlenbeckia astonii* | |
| | Cliffs and escarpments | *Pencarrow Coast Road* | | |
| | Coastal Dunelands | Dry and mobile sandy beaches (fore dune), eg Petone Beach | Pingau<br>Spinifex | Spinifex |
| | Coastal shrublands | Baring Head | *Coprosma propinqua*<br>manuka<br>*Olearia solandri* | |
| Lowland Coastal Wetlands | | Pencarrow Lakes: Lake Kohangatera and Lake Kohangapiripiri | Raupo<br>kuta | marsh ribbonwood<br>manuka<br>Cabbage tree<br>native broom |
| Lowland Coastal Forest (sheltered) | Podocarp/Broadleaf Forest | Percy Gully and top of Cheviot Road, Lowry Bay | kohekohe<br>nikau<br>tawa<br>pukatea<br>tawa<br>hinau<br>rimu | ngaio<br>taupata<br>black maire<br>white maire<br>tiitoki<br>rewarewa<br>kanuka |
| Lowland Forest (exposed) | Podocarp/Broadleaf | | Oleria panniculata<br>ngaio | taupata<br>mahoe<br>kawakawa<br>5 finger |

| Forest Type | Habitat | Example of local site | Dominant canopy species | Key native colonising species |
|---|---|---|---|---|
| Inland Forest | Podocarp/Broadleaf Forest<br>Fertile, moist | Wainuiomata<br>Water Catchment, Belmont Regional Park, upper Korokoro Stream<br><br>*Altitude restrictions*<br>*Below 400m tawa, kamahi*<br>*Below 550m northern rata, rimu, hinau, kamahi* | rimu<br>kahikatea<br>northern rata<br>matai<br>kamahi<br>miro<br>tawa<br>titoki<br>hinau<br>totara (on raised terraces) | Tawa<br>Mahoe<br>Titoki<br>Kamahi<br>Manuka<br>Kanuka |
| | Beech Forest<br>Shallow dry, leached, clay-rich hillsides up to 200m | Williams Park<br>Hayward Scenic Reserve<br>Stokes Valley Road | hard beech<br>black beech | Manuka, esp after fire then low mixed broadleaf forest |
| Inland lowland Swamp Forest | | Mohaka Street and Waiu Street, Wainuiomata | kahikatea | |

It is difficult to summarise and match habitats with species. So many factors contribute towards ideal habitat for each species. Also, individuals populate the margins (and beyond) of their ideal conditions. The general idea is that the combination of conditions such as humidity, salt laden wind, exposure to wind, sunlight and moisture, along with altitude, soil fertility vary, creating different habitats. These habitats are populated by species best able to survive in them. Many are specifically adapted to survive in a particular microclimate in a single habitat.

Council recognises that the urban forest, particularly natural areas, is made up of more than just trees. Also present in the urban forest are ferns, fungi, liverworts, grasses, sedges, microbes, lichens, birds, insects, bacteria, invertebrate species etc. Many exotic species are present in natural areas. However, for the purposes of this plan, local native species in natural areas take priority. The exception would be historical plantings with known provenance that may be managed as an exception.

The Wainuiomata Water Catchment is a significant piece of unlogged forest in the Lower North Island. It is owned and managed by Greater Wellington the Regional Council as a mainland island as well as a water catchment.

The fact that a site is not in premium condition currently is not necessarily an indicator that the site is less valuable than another. It may merely be that revegetation processes still have a way to go. Key sites like the Eastern Hills of the Hutt Valley between Stokes Valley and Waiwhetu are valuable now because of the potential they have to contribute to the urban forest over the long term. Patiently managing pests and fire will eventually bring tremendous benefits to the City in terms of ecology, connectivity, soil conservation, air quality and water quality. The obvious issue with the current (gorsey) level of presentation is only temporary.

In terms of botanical knowledge, Hutt City's location is fortunate. Today we benefit from being near the head office of the Department of Conservation, Te Papa, IRL and Victoria University. The Lower Hutt Branch of the Royal Forest and Bird Protection Society of New Zealand and the Wellington Botanical Society are active and Hutt City Council, Wellington City Council, Porirua City Council and Greater Wellington the Regional Council are developing closer working relationships. Council's contractor, Downer New Zealand Limited is a key player in the management of the City's natural areas. In addition, a number of highly regarded ecology, landscape, arboriculture and horticulture experts live and provide services locally.

## What's special?

New Zealand forests are complex communities of plants and animals. New Zealand's native plants reflect "ancient elements, while others are regarded as recent developments." Foster

Botanists recognise that "many native plants have ties to plant families in both the northern and southern hemispheres, some of which reflect the country's Gondwana origins." Foster. There is a significant Australian and sub-Antarctic element to our native flora. Our forests also contain tropical influences and the presence of epiphytic species, vines and climbing plants provides local evidence of this.

In our city native conifer species such as totara, rimu, kahikatea, matai and miro established on fertile alluvial river terraces, where they gained the benefit of nutrient enriched

floodwaters. A range of native conifers were well represented locally prior to European settlement. We value them for their pyramidal form, their timber and because they can achieve incredible age and size.

Beech's ancestors covered the southern supercontinent of Gondwana well over 100 million years ago. Hard beech and black beech are still present along the Eastern Hills of the Hutt Valley (Stokes Valley to Eastbourne) and in the Wainuiomata Valley.

Some plants that were once in New Zealand are no longer here because they were unable to survive or adapt during periods of glaciation.

Native plants established and evolved in the unique climatic and geological conditions of the Wellington Conservancy, so are well adapted to grow here. Unfortunately many proved to be poorly adapted to compete with grazing, land clearing, invasive weeds, fire and pest animals.

> *"The list of plant species that have disappeared or are threatened in the Wellington Region makes sombre reading. Some losses have been so rapid that we can hardly grasp the fact". Gabites, 1993*

## Issues in natural areas

In 2001, Rob Small, an Australasian parks industry leader, predicted for the industry that:

> *"Undoubtedly the key issue for the next 10 years will be emerging credibility and emphasis given to environmental issues. In our areas the impact of issues such as managing biodiversity in natural reserves will assume increasing importance. The consideration of environmental matters will come as the country (and the globe) begins to articulate concerns such as green house gases, water and air quality and the principle that we can't survive by being driven by the economic bottom line alone, to the detriment of our environmental capital".*
>
> Small

Although the Hutt Valley and Wainuiomata Valley and the hills surrounding them are vastly different in appearance from 1840, they are steadily revegetating and may eventually represent pre-European vegetation in places where site conditions are relatively unmodified. Alterations to catchments, streams and rivers have impacted on function, however growing appreciation and concern for the City's natural environment and increased knowledge about ecological restoration places Council in a positive position.

Introduced species compete with native species. Pest plants, pest animals, fire and urban growth present challenges to Council's management of natural areas.

The mature plant communities which were present prior to pre-European settlement have been massively reduced. For some species, the fragmentation of their habitats has spread surviving male and female specimens too far apart to breed. It is important to analyse the local situation carefully prior to deciding whether to alter the status quo. This work should begin with:

1. Investigation of Beech Forest restoration potential if left and if assisted; and
2. Investigating whether the proximity of habitat and food sources is adequate for native birds to thrive and breed abundantly and recommend practical initiatives –

this may have implications for the development and management of Council's Urban Parks as well as Natural Areas

Species such as black beech and hard beech may not regenerate well left to their own devices. It is uncertain whether the available seed source along the Eastern Hills will be adequate to approximately replicate near original patterns of beech species in natural areas. While Council is very interested in regaining some pre-European vegetation patterns in natural areas, the most important requirements are vigour, diversity, presence of local native species and the process of succession occurring naturally to allow canopy species to emerge and thrive.

Note that the premise that "Big is Good" applies to natural areas. The whole of any natural system is more than the sum of its soils, vegetation, climate etc. The synergy of parts of the forest increase as size of sites increase. Problems of exposure to wind, light and weed invasion (edge effect) decrease as site size increases. Adding land at boundaries or improving connections to existing lands nearby effectively (not literally) increases the size of sites. Colin Meurk, a scientist with Landcare Research at Lincoln, had developed design considerations for natural areas, including guidelines for size and separation distances. This work could be incorporated into a master plan for connectivity of natural areas.

Given the quantity of land and its spatial layout in this city, connectivity is a strong focus of this Urban Forest Plan. Treating the existing publicly owned natural areas as a skeleton and concentrating on connecting what we've already got is a practical approach. Some restoration and strategic land acquisitions would also benefit ecological and recreational functions in natural areas. While trees in urban parks and street trees can play a small role in connecting natural areas, their contribution is limited because specimen trees, particularly exotic species, do not really constitute habitat.

The young regrowth we witness locally does not necessarily resemble pre-European vegetation. Identifying the type of vegetation that would have been present and working out how to achieve that again will be challenging. Apart from pest and fire management, the most important thing at this time is to make a genuine, fully considered attempt to re-establish vegetation that approximately replicates pre-European vegetation patterns in natural areas. Lack of trying for fear of getting it partially wrong is a wasted opportunity. Hutt City Council will favour practicality over a pure approach to revegetation.

The use of locally sourced native plants and seeds is important. Sawyer and De Lange support this concept strongly in their chapter in Spellerberg, 2004. For example locally, it is inappropriate to introduce southern rata to our natural areas in order to extend the rata flowering season. Southern rata is not part of our local landscapes and introducing it may interfere with our local native ecology. Equally Council would not plant spinifex sourced from the coast of West Auckland. Seed would be collected from plants known to be local, although they may be propagated elsewhere.

Horticultural cultivars and non-local native species will (or may already be) hybridising with local native species such as northern rata, cabbage trees, kowhai and manuka. This may interfere with biodiversity. Given the number of non-local native such as pohutukawa used by Council as street trees and the number of native cultivars in domestic gardens, this will be tricky to manage. It may not even be practical, particularly in the short term, and perhaps the most that can be achieved it to mitigate ongoing detrimental effects by applying good management techniques.

Lowland wetlands are precious and host a specialised range of flora in and around them. The number of lowland wetlands in our city has declined to around 4. Either in full, or in part, these 4 wetlands sit on public land and are managed as reserve by GW, DoC and HCC. The Pencarrow Lakes host a range of threatened plant species. The Pencarrow Lakes, Waiu Street wetland and Mohaka Street wetland and their surroundings and catchments warrant special attention.

Incomplete knowledge and little local research means that some restoration attempts will need to be treated as experimental. This may provide an opportunity to work with academic institutions and volunteers. We need to know more about the condition of our natural areas so that we can determine the best methods for achieving pre-European vegetation.

Monitoring the coverage and condition of vegetation has historically been overlooked by Council in its management of natural areas. There is plenty of scope for improvement.

We need to promote the value of “scrappy looking” species such as manuka and Kanuka and the plants of coastal our native grey shrublands. We’re lucky to have them. They are part of the forest system.

Meterosiderous cultivar, Elizabeth Street Petone. Will it produce seed and interfere with local ecology?

## Themes

The concept of connectivity is already embedded in Council’s Reserves Strategic Directions and the Policy and Guidelines for Reserves Acquisition and Disposal. There are opportunities to encourage habitat protection on private property, for example assisting land owners to set up new covenants oriented towards protecting vegetation. Although important, especially in the case of threatened species, the welfare of the habitat or site is generally of more importance than the welfare of individual specimens.

Draining, urban development and soil importation/exportation all interfere with the ability to replicate pre-European habitats. Given this limitation, options for locally appropriate native restoration exist and will be favoured by Council. There are opportunities to apply this thinking on Council land that is being restored and on some subdivision sites.

Council is committed to carrying out fire mitigation and pest plant and animal control in order to enhance the opportunities for local native species in natural areas. In some sites this will include "management" of non-local native species such as karo, *Muehlenbeckia australis*, pohutukawa, and puriri. Karaka also warrants management in some areas, although it is considered to be native. Council's pest plant and animal management targets a range of species. Some of the Council's most significant sites, such as Percy Scenic Reserve, receive more attention than others. For example, karaka will be managed at Percy Scenic Reserve on the basis that they interfere with local native regeneration processes. In most other sites it is desirable, but impractical, to manage karaka. Council has previously resolved that chemical methods of pest control are acceptable.

Council will keep a watching brief on possible problem species, for example puriri and pohutukawa in natural areas, and this may lead to control of some species. Hutt City Council works with other agencies to predict emerging pest plant species that may interfere with local native biodiversity.

Beyond pest animal surveys, there is little data available to indicate whether the natural areas managed by Council are in good condition. It would be worthwhile exploring some simple methods for assessing the condition of natural areas and tracking the results. Further to this, another worthwhile task could involve investigating the concept of carrying out gap analysis (or similar) of the proximity, habitat and food sources available to local native birds and could include urban parks and street trees.

# Urban Parks

**How we've got what we've got**

The New Zealand colony was subject to the policies of the British Empire and certain social, economic and legislative characteristics were installed in the new New Zealand society. One of these was the settlers' desire for lush, gardens with trees and flowers, typical of Victorian gardens in England.

A number of private gardens performed the function of today's horticultural parks from the late 1800s until the 1940s. Sites owned by Ludlam, Molesworth, Mrs Ross and the Percy family were open to the public regularly. "…the Hutt was still and increasingly so the place you took visitors to tea away from the smoky city, to wander around the gardens without peer in the province, perhaps in the colony, possibly in the southern hemisphere." McGill 1998

For the purposes of this plan, Urban Parks refers to Council's horticultural parks, urban reserves, sports grounds and cemeteries. With the exception of horticultural parks, vegetation in urban parks is more a feature of the site, rather than the purpose of the site.

Natural habitats and conditions in Hutt City have been extensively modified as a result of the City's development. The current environment offers valley floor residents a sense of safety and control over natural forces. The natural form and behaviour of water in today's Hutt Valley has largely been lost since European settlement. Sites vary in terms of climate, soils, moisture, pest and disease, wind, public use (and abuse). These days river engineering and plentiful reticulated water make it possible to cultivate a wide range of species and this provides a significant "benefit" to landowners, including Council. There is increasing consideration given to the sustainability of Council's water use on its open spaces and this relates to Urban Parks and street trees.

Many of Council's horticultural parks emphasise amenity horticultural displays, much the same as they have for decades. Specimens are grouped in beds amongst high quality turf; the expectation being that the public will promenade around the site, taking pleasure from leisurely enjoying the primarily exotic horticultural displays.

In the six horticultural parks listed below the vegetation (turf, annuals, shrubs, trees etc) provide the main interest although the sites are used for non-horticultural activities such as physical recreation.

They usually contain some non-horticultural features for example playgrounds. Hutt City's horticultural parks include:

Mitchell Park

Riddiford and Civic Gardens, Central Hutt

Garden of Remembrance, Petone

Speldhurst Park, Stokes Valley

Belmont Rhododendron Dell, Belmont Domain

Ballinger and Makaro Gardens, Eastbourne

In general vegetation in horticultural parks are highly cultivated, while vegetation in other urban reserves is maintained to lower standards. In sports grounds the quality of the turf is critical. Council acknowledges that the function and appearance of horticultural parks is likely to change over time.

Internationally, the expectations of horticultural parks are changing and horticultural displays are increasingly managed alongside other functions, particularly recreational activity and public education. A horticultural park commissioned today would certainly have a wider range of functions than gardeners had in mind when Hutt City's existing horticultural parks were established. Given that the range of horticultural parks is unlikely to alter much during the life of this plan, it is reasonable to treat horticultural parks slightly differently in terms of their contribution to our urban forest.

Other urban parks contain vegetation but the grounds are provided for other purposes, generally recreation and relief in the suburban landscape to contrast with development. Clearly cemeteries have a specialised function and the vegetation at Council's cemeteries is intended to establish an atmosphere which enhances the functional provision of sites for interments and is welcoming for those visiting graves.

Examples of other Urban Parks include:

Antrim Crescent Reserve, Wainuiomata

Avalon Park, Avalon

Hikoikoi Reserve, Petone

HW Shortt Park, Eastbourne

London Road Playground, Korokoro

Maungaraki Green Space, Maungaraki

Rotary Park, Wainuiomata

Te Whiti Park, Waiwhetu

Tom James Park, Stokes Valley

Wesleyan Cemetery, Alicetown

Williams Park, Days Bay

"A few nikau palms can still be seen in the centre of Lower Hutt. Countless 19th Century travellers said of the forests they saw in New Zealand the "elegant nikau palms give them quite a tropical aspect". Alfred Ludlam certainly thought so. Taking over Francis Molesworth's estate when he returned to England in 1845, Ludlam began a garden and kept the nikau as centrepieces. When he died, in 1877, James McNabb bought the land and turned Ludlam's venture into public gardens. By the 1890s 'the nikaus, ferns palm trees, rata and other representatives of the New Zealand Forest were 'the most pleasing features' of 'a favourite resort'. Some of the nikau that spread their fronds over Victorian rose beds managed to survive the gardens' subdivision into house lots in the 1940s, when the campaign to have Ludlam's vision preserved for the nation failed." Park 1995 pg 81

NOTE that around the time Ludlam's gardens were being proposed as a reserve, the Crown decided to acquire the estate of the Percy brothers for scenic reserve purposes. Ludlam's reserve proposal was unsuccessful.

## Benefits of vegetation in urban parks

"Access to nature, whether it is in the form of bona fide natural areas or in bits or views of nature, impacts psychological, as well as social functioning. Greater access to green views and green environments yields better cognitive functioning; more proactive, more effective patterns of life functioning; more self-discipline and more impulse control; greater mental health overall; and greater resilience in response to stressful life events. Less access to nature is linked to exacerbated attention deficit/hyperactivity disorder symptoms, more sadness and higher rates of clinical depression. People with less access to nature are more prone to stress and anxiety, as reflected not only individuals' self-report but also measures of pulse rate, blood pressure, and stress-related patterns of nervous system and endocrine system anxiety, as well as physician-diagnosed anxiety disorders.

The impacts of parks and green environments on human health extend beyond social and psychological health outcomes to include physical health outcomes. Greener environments enhance recovery from surgery, enable and support higher levels of physical activity, improve immune system functioning, help diabetics achieve healthier blood glucose levels, and improve functional health status and independent living skills among older adults. By contrast, environments with less green are associated with greater rates of childhood obesity; higher rates of 15 out of 24 categories of physician-diagnosed diseases, including cardiovascular diseases; and higher rates of mortality in younger and older adults. Most important, all of these studies take into account the role that income might play in an apparent link between access to nature and physical health outcomes. While it is true that richer people tend to have both greater access to nature and better physical health outcomes, the comparisons here show that people *of the same socioeconomic status* who have greater access to nature have better physical health outcomes." Kuo for National Recreation and Parks Association 2010

Vegetation in urban parks provides an established feel and creates a unique identity for the site and possibly the neighbourhood. Vegetation provides shade and shelter to urban park users. Vegetation can define areas and humanise the scale of a vast site. Vegetation can provide both interesting living features and can be a backdrop to other features or activities in urban parks. Frontages of urban parks can provide tree planting sites which may negate the need for street trees. Trees and other vegetation at the entrance to an urban park can be more welcoming and encourage visitation

In terms of vegetation, urban reserves and sports grounds provide opportunities for:

- Trialling species for other sites
- A limited display of ornamental or "novelty" specimens to add character to a site eg monkey puzzle tree, handkerchief tree and cork oaks.
- Displaying large and very large specimens (over 15m) that cannot practically be hosted on private properties. This is particularly important in areas where section sizes are small, say below 400m², and areas where private gardens are poorly vegetated.

- Demonstrating native and exotic species that do well in local areas
- Enhancing biodiversity by contributing to the concept of connectivity set out under Natural areas, Objective 1.1.
- Including trees that already feature (and thrive) in the local area, for example Ash in Naenae in order to strengthen the presence of a species and contribute to the horticultural theme or character of that area
- Seasonal display of autumn foliage, including the experience of observing, collecting and messing about in fallen leaves.
- Areas for imaginative play in “natural” settings

## Issues in urban parks

Vitamin G might not be a phrase we hear much but it refers to the green environment and the belief that it plays an important role in human health and wellbeing. There is an increasing appreciation for the value of vegetation and contact with nature. As Hutt City’s population density increases we can’t afford to be without good amounts of good quality open space. Trees and vegetation are important components of open space in our city.

“Trees are the most important scenic features that can be added easily in almost every part of the land”, Mitchell and Coombes, 1999

In general the quality (size, form and health) of trees in urban parks is higher than the quality of street trees. This statement is based on 2008 and 2009 surveys of street trees, reserves and sports grounds. The cemeteries have benefitted from several rounds of felling and proactive tree maintenance over the past 15 years. Officers suspect that the quality of trees in horticultural parks would rate between good and high. Surveying trees in horticultural parks would determine quality.

With the exception of horticultural parks, there are many opportunities to display more large specimens in urban parks, particularly in sports grounds and urban reserves.

| | |
|---|---|
|  |  |
| Butler Street Reserve, Naenae – few specimen trees provided | Hewer Crescent Reserve, Naenae – few specimen trees provided |

With the exception of horticultural parks and cemeteries, officers generally believe that the quantity of trees in urban parks is unevenly distributed. There is a need to address overplanting on some sites, eg Walter Nash Park, and underplanting at others, eg Butler Street Reserve and Hewer Crescent Reserve.

Just as it is good to increase the use of natives, particularly local native species, where conditions are suitable, exotics also contribute significantly to the local identity and character of our urban areas. Over time increased use of native material may result in reduced expectation for lushness in favour of more local species, less inputs and higher quality.

The use of native species as street trees is limited. Many native species thrive as part of a cluster of vegetation in a forest situation. Exposed in a specimen situation, they tend to perform poorly.

## Themes

Council aims to provide residents and visitors with access to attractive vegetated settings and recreation opportunities in urban parks and thereby improve the character of the city, facilitate social interaction and encourage outdoor physical activity.

Based on the 2009/2010 reserve tree survey, Council needs to concentrate on developing a thriving and flourishing urban park tree asset. Each site warrants its own character and this will require planning. Council will undertake a strategic, but simple, master planning process for reserve and sports ground, trees using data from tree surveys. Developing a plan for specimen trees in urban parks will involve:

- Planting more of the “right” trees in the right places on reserves
- Heavy emphasis on providing quality specimen trees
- Nurture young trees.
- Prioritise removal of poor or struggling specimens when it is apparent they will not thrive and flourish. Do not let struggling specimens linger.

All things being equal, the intention is to move towards a situation where local native species are increasingly displayed for their horticultural and ecological merits throughout the urban area. This could be in the form of herbaceous, shrub and woody species.

Use of local native species is desirable because it contributes to a sense of place and helps to establish local character. Council’s general approach is not pure. Where there are choices and site conditions allow, local native species will be favoured but the overriding consideration is to look at the conditions and requirements of the site and select the right plant for the right place. The primary aim is to provide quality specimen trees (native or exotic).

There is an opportunity to apply a “gradient of naturalness” Erickson, to the urban form. The general concept is to identify urban hubs and accept that urban forest components in the hub and close to it can be exotic, showy and highly cultivated, while the urban forest furthest from the hubs will ideally consist of local native habitat genuinely representative of pre-European vegetation, receiving no cultivation and little maintenance. In other words “naturalness” will radiate away from hubs with increasing intensity. Somewhere between the hubs and the

natural areas highly cultivated landscapes will fade out, making way for less cultivated and more natural areas. Apart from natural areas, exotics could be part of the urban forest and of course local natives could be part of the urban forest at hubs. It makes sense to favour local native species, where practical, because they are part of our local identity and they are well suited to our local climates, not withstanding those sites that have been modified by drainage, excavation, infrastructure or soil loss.

From a human perspective, the gradient of naturalness concept would seem to provide something for everyone. Native purists would be satisfied at the periphery of the City and fans of horticultural fancy would be happiest at the hubs. The rest of us will find much to enjoy throughout the city.

At an operational level, Council will manage a range of pest plants with a range of methods and products. Management of weeds and pests will vary across sites according to site specific weed and pest issues. In urban parks trees species such as karo, sycamore and self sown prunus are problematic. They are undesirable because they seed prolifically and establish in neighbouring areas, including natural areas, where they interfere with natural biodiversity. In addition to pest trees, Council manages herbaceous weeds and turf weeds in urban parks.

Council's contracts and reserve management plans make provision for chemical control of pest plants and animals, manual weeding, trapping and felling to control pest plants. Methods and products will be carefully considered and correctly applied.

Council does not want to be responsible for introducing and cultivating plants that may become a problem in the future. Council will keep a watching brief on possible problem plant species and this may lead to control of some species. Where officers suspect that plant species may become weeds or pests alternative species will be specified for Urban Reserves.

# Street Trees

Trees in streets and urban parks are “essentially a symbolic forest it is also the most visible part of the urban forest …” US Department of Agriculture 1993.

Street trees are expected to flourish in highly modified sites, primarily orientated towards other purposes – traffic, roading, footpaths, grass, underground pipes/cables and overhead lines. Their management requires an expert and pragmatic approach in terms of planning, design and maintenance.

Hutt City is essentially an urban local authority, well known for its residential suburban areas. In terms of this plan, the basic premise is that trees are generally a beneficial and desirable component of urban areas, particularly streetscapes. Quality street trees are valued features in developed areas. They have a softening effect on the built environment and they play an important role in defining the City’s character. In addition, street trees can have historic, cultural or scientific significance. In order to make a worthwhile contribution, street tree management needs to balance the needs of street trees with human and infrastructure requirements. In this respect, the management of street trees varies greatly from the management of urban parks and natural areas.

The most established areas of our city contain good numbers of quality street trees. There are few opportunities to provide additional trees in these areas. Younger suburbs and those with higher levels of deprivation and less valuable properties contain fewer street trees and there are a number of opportunities to provide additional street trees in these areas.

In our seasonally gusty climate many trees are challenged. The public expectation for large trees and a large range of trees often cannot be met because of these constraints. On the other hand there are a number of residents who do not see the value of street trees, particularly near their property.

The Urban Forest Plan sets out visions objectives and policies that will gradually change the existing street tree asset. In 2008 and 2009 Council officers in the Parks and Gardens Division thoroughly surveyed Council’s street trees. Council now holds a wide range of detailed and accurate street tree statistics. Analysis of this information influenced the objectives and policies in the Urban Forest Plan. The survey conclusively defined the size and condition of the street tree asset. Over 80 issues were identified. In summary, these related to tree planting, tree management and tree maintenance.

The big concern is lack of quality[2] specimens across the street tree asset. Improving the quality of street trees in Hutt City depends on a change of mindset. Council officers, elected members and the public need to take a more holistic and long term approach to planning and managing the street tree asset. The objectives and policies for street trees in the Urban Forest Plan have been developed with the intention of establishing a new approach with an emphasis on proving leafy, green suburbs containing quality street trees.

It is possible to address some of the street tree issues identified in the survey and implement some of the Urban Forest Plan objectives and polices without additional funding from 1 January 2010. Some simple and quick changes will resolve several issues while others will

[2] A quality street tree is one that is 7 to 15m tall and is in good health and displays good form

need to be rolled out gradually. Implementing other some street tree objectives, particularly street tree master planning will require additional resources.

Council's 2007 Parks and Reserves Asset Management Plan (AMP) sets out Activity Standards for Street Trees. These were set prior to surveying and need to be adjusted, following the adoption of this Urban Forest Plan in 2010.

The annual operating budget for street trees is $544,000[3] excluding gst[4]. This figure includes the Parks and Gardens Division's operating budgets for street trees, which includes the contract cost for street trees. Hutt City's population, based on 2006 census data, is 97,701.

If the current regime for planting and maintaining trees under lines continues, by 2030 the annual maintenance contract could theoretically increase by $181,000 (or 30%) just to cope with line clearance.

The table sets new targets which Council will measure itself against in the future. It is likely that some of the targets will need to be amended before 2030 but as at 2010 they appear to be realistic so long as additional staff resource can be allocated to implementing the urban forest plan, particularly to street trees.

[3] Based on 2011/12 operational budgets

[4] This figure is taken from the 2011/12 annual operating budgets and excludes Parks and Gardens. It includes the annual contract cost for street trees. It excludes overhead costs (Operating & Employee Costs plus Support Costs) and Notable Tree cost of $16,000.

| | Activity Standard from 2007 AMP | Current situation | Target |
|---|---|---|---|
| Operational Cost of Street Trees | $4 per resident annually | $5.57 per resident annually (average)<br>$45 per street tree annually(average) | $5.57 per resident annually (average)<br>$45 per street tree annually(average) |
| Quantity of Street Trees | 100 per 1000 residents | 120 per 100 residents<br>12,106 total | 120 to 140 per 1000 residents<br>12,000 to 14,000 total approximately by 2030 |
| Quantity of new Street Trees | 60 new trees annually | 64 mostly replacement but some new | 350 per annum 2010 to 2030, beyond that, 135 annually based on 12,106 asset size |
| Quantity of Street Trees per dwelling | Not determined | 1 tree per 2.9 dwellings | 1 tree per 2.4 to 2.9 dwellings or 25% to 75% of dwellings in a street have a street tree outside them. |
| Quantity of Street Trees | Not determined | 12,106 | between 12,000 and 14,000 by 2030 |
| Estimated useful life | Not determined | 73 years | 90 years (or better) by 2030 generally |
| Quality | Not determined | 9% of street trees in good health, good form and 7 to 15m height currently | 60% of street trees in good health, good form and 7 to 15m in height by 2050 |
| Height | Not determined | 28% of total Street Tree asset at 7 to 15m currently | 70% of total Street Tree asset at height of 7 to 15m by 2050 |
| Balance of species | Not determined | 5 main species comprise 47% of total Street Trees | Citywide no one species to make up more than 7.5 to 10% of total number of street trees and no single genera make up more than 25% of total street trees by 2050. |
| Age spread | Not determined | 6% of Street Trees older than 70 years | 20% of Street Trees older than 70 years by 2050, with younger trees spread more evenly across 10 year periods |
| Street Trees under lines | Not determined | 47% | Under 25% and continuing to reduce |
| Street Trees (already planted prior to winter 2010) requiring ongoing heavy pruning from lines | Not determined | 17% | Under 15% by 2030* |
| Quantity of new trees planted in winter 2010 and beyond, which will require planned ongoing heavy pruning to clear lines by 1m | Not determined | some | Under 1% of new street tree plantings annually, only in exceptional circumstances under 400V lines |
| Cost of line clearance | Not determined | Estimated to be 30% of contract | Less than 30% of total contract budget for street tree maintenance |

## My, haven't you grown?

Just like cars, trees need maintenance, servicing and inspections. Trees also have effects on their environment and this sometimes includes blocking drains, dropping leaves, damaging kerbs, lifting footpaths. Trees can interfere with underground and overhead services, affecting the reliability of electricity and telecommunication services.

Well formed mature pohutukawa in sensible locations make a tremendous positive contribution to the character of many neighbourhoods in Hutt City. Many residents believe that that the benefits provided by these trees generally outweigh drawbacks such as shade. Not all residents share this belief.

Trees are a bit like icebergs. The visible portion of a tree is roughly proportional to the underground portion of a tree. As a general rule, the extent of root growth is normally around three times the canopy spread. This has implications for underground services, paths, footpaths and berms.

As trees gain height, crowns expand, roots reach wider the scope for interference grows. Generally speaking, quality trees are more worthwhile than smaller trees but providing them needs to be balanced with the reasonable requirements of neighbours and the function of the road reserve. The aim is to minimise the cost of damage caused by trees in road reserves but to some extent damage is inevitable in some sites.

# Benefits of street trees

Hutt City Council's Long Term Plan 2009 – 2019[5] indicates that residents want exceptional quality of life, a healthy environment and a rich, diverse sense of place; in other words a liveable city. Street trees and urban greening are key contributors to liveability. Street trees are ornamental but Council doesn't just plant them as decoration. They offer our city a complex range of more significant benefits, including:

- Psychologically, trees provide people with pleasure (uplifted spirits) and good feelings; they make outdoor recreation and commuting more pleasant and interesting
- Street trees improve the look of streetscapes, they soften the built environment and enhance identity, and they can create inviting streetscapes. Well managed street trees contribute to a high quality public realm which invites more people to use our city in a variety of ways. Street trees can create settings that help attract businesses and residents.
- Street trees assist with muffling the noise of traffic
- Some street trees provide symbolic links with the past – they have heritage values
- Environmental values, trees contribute through climate control, air pollution control, shade, wind shelter, noise pollution control plus soil and water quality conservation
- Mature street trees provide a more human scale in the built environment
- Street trees and mature trees on private properties can improve property values.
- Mature trees give an established look to the landscape and create character and significant landmarks
- Street trees can connect public open spaces and can delineate desirable walking and cycling routes (particularly recreational ones)
- Street trees can have historic, cultural or scientific significance
- Provide food sources to birds and insects – they can contribution to biodiversity and ecological connectivity albeit in a minor way
- Mitigating the effect of storm water

These bullet points have been adapted from World Forestry Center et al, 1993

In addition to the benefits listed here, many other benefits have been attributed to street trees.

Clearly street trees have value (financial and non-financial). In Hutt City the benefits set out above are fairly well recognised although not so easily measured.

It is possible to place a dollar value on specimen trees using various tree appraisal methods. The primary method for estimating the financial value of a specimen tree in New Zealand is the STEM method[6]. STEM evaluations consider many factors, including species, age, form,

[5] Hutt City Council Long Term Plan pages 23, 25 and 30
[6] The District Plan – City of Lower Hutt currently uses the New Zealand Institute of Horticulture method for specimen tree assessments

health, longevity, historical provenance and rarity. This is not to say that the value of a tree boils down to its financial value, but STEM does allow the value of individual specimens to be assessed in a fairly objective way. It can be applied to exotic and native species but is really geared towards specimens in amenity situations.

It is possible to measure the value of trees, including the level of energy savings, air quality improvement and carbon sequestration using specialised software and quantitative tree information. Officers are not aware of any New Zealand local authorities currently involved in this type of measuring. The methods have been developed in California and appear to be used mainly in North America and are sensitive to location, climate and species. Dr Greg McPherson, Center from Urban Forest Research, Davis California is well known for his work in the specialised field of assessing benefits generated by urban forests.

## Issues with street trees

Four issues particularly need to be considered.

1. Quality of street trees is a big issue in Hutt City. The proportion of street trees that are not (or are unlikely to develop into) quality specimens is inacceptable. There are many contributing factors, including trees co-existing with infrastructure, poor site selection, inadequate care of young trees[7]

2. The current management and planting regime is unaffordable and, if tree quality is not improved, will not represent good value for money

3. Coherent planning and design for the street tree asset citywide has been lacking, largely as a result of limited staff resources and a strong focus on customer satisfaction and a focus on individual trees.

4. The anticipated residential growth will predominantly occur as infill housing in existing residential areas in the Central Ward. This is likely to result in some people living closer to large trees, while others will consciously avoid planting large trees on small sections in favour of sunlight and less interference from trees.

Street trees have five basic needs – adequate soil, adequate space, suitable climate, air and sunlight. Trees rely on a natural balance between these factors to achieve optimum growth. When the supply of a tree's basic needs diminish the long term results may result in limited growth poor health, poor form or shorter life. Unfortunately many of our street trees have been planted without adequate consideration of a tree's basic needs or the "right tree, right place" concept.

The right tree in the right place has a higher chance of flourishing, while limiting interference with the built environment and ongoing costs. Selection of species is critical and the primary consideration is assessing the site and choosing a tree to suit the conditions (natural and man-made).

Street trees generate a lot of requests and complaints. The realities of managing trees in public places (especially the concept of limited useful life) are poorly understood by many members of the public.

[7] Trees that have been planted 3 years or less

Prudent long term decision making about the overall street tree asset has been compromised by Council's tree maintenance policy[8], which requires consultation and aims for consensus amongst neighbours. By adopting this Urban Forest Plan Council has agreed to focus on improving the quality of street trees based on professional tree management and the principles of asset management planning.

**Quality issues**

> *"The strength with which the tree grows, known as vigor, must remain high enough to prevent attack by disease-causing agents such as bacteria, fungi and insects."*
>
> US Department of Agriculture 1993

Recent surveying indicates that some street trees are performing well. Many lack quality and a few are simply liabilities.

Of 12,106 street trees only 9% are considered to be good quality (good form, good health and 7 to 15m height). This statistic is very concerning, especially because the number of good quality specimens is likely to decrease over the next 20 years as a result of pruning to clear canopies away from overhead lines and comply with the Electricity (hazards from trees) Regulations 2003.

Underground and overhead works increase the chance of the tree being harmed and losing quality and so can changes on the surface, such as converting grass berms to concrete.

Prior to 2010 street tree management did not emphasise the importance of early tree care. This has affected the quality of existing street trees negatively. Inspection, formative pruning and removal of poor specimens will improve the quality and vigour of today's young trees, as they progress towards maturity. Better care of young trees is likely to result in well formed specimens which develop into strong, mature trees.

This vandalised 2008 planting warrants prompt removal, to avoid a poor mature specimen

[8] On 26 July 2011 Council adopted the Operational Guide for Street Trees, making the Tree Maintenance Policy redundant.

Beyond a tree's first two or three years in the ground, Council should avoid unsustainable tree maintenance practises. This includes species and sites that will require ongoing irrigation.

In this City wind often challenges the form of street trees. Specimen trees do not gain shelter from the trees surrounding them as they would in their natural habitats. Prevailing winds can shape tree crowns into atypical, weak specimens and unfortunately there is plenty of evidence of this locally. Few native trees will thrive as street trees.

Inadequate formative pruning of young trees can affect form and in turn this may affect health and longevity

**Trees co-existing with infrastructure**

Our street trees are an important component in Hutt City's urban forest. Street trees require special management because they are expected to thrive in the urban environment - amongst pavement, with limited access to soil, limited water, in compacted ground, with the surface sealed, with passing vehicles, in the shade of buildings, amongst overhead and underground services as well as alongside neighbours. These tough conditions and constrained growing space require practical strategies for hosting trees in our streetscapes.

Trees can damage infrastructure (underground, surface and overhead). Damage from tree roots requires Council to relay sections of lifted footpaths, kerbs and damaged roads and pipes. Although this is not ideal for the tree or Council's budget, it is very important that Council provides quality surfaces. Damage to the surface of sealed roads will compromise the subsurface, resulting in expensive repairs. Damage to sewer, storm water and water pipes is inconvenient but it is part of the cost of having trees in the urban area. Raised and broken sections of footpaths are a trip hazard for pedestrians.

The bulk of this damage is related to mature and semi-mature trees planted in berms that are too small for the species planted there. Some of the problem relates to elderly pipes but it is generally exacerbated by tree roots. Modern plastic pipes withstand more encroachment from tree roots but eventually they will succumb and fail. Damage to tree roots may have greater impact on the long term health of trees than pruning the crown to cope with overhead lines. Officers find that underground issues are far less controversial to deal with than those concerning the above ground portion of the tree. Tree roots can damage public

infrastructure and disrupt services. They also interfere with the function of pipes servicing private properties. Maintaining underground assets and services is likely to have an impact on the health of trees.

Council is required to comply with the clearance requirements for vehicles and footpaths as well as those set out in the Electricity (hazards from trees) Regulations 2003. In summary, trees are required to be pruned down to clear overhead lines and up to clear trees away from footpaths and roads. Council treats its responsibilities under the Tree Regulations very seriously. However, with good planning and adequate berms, there is plenty of scope to provide many good quality street trees in Hutt City.

Council allocates $35,000 annually for repairs related to damage caused by trees, mainly raised footpaths, damaged vehicle crossing and kerb repairs that have been damaged by the roots of trees. [9]

Making the right choices about the location, species and management of existing and new street trees allows street trees to have significant impact at street level, while limiting interference with other functions of the street and unreasonable nuisance (significant shading and overhang) to neighbours. This is a challenge as the number of species, site considerations and variety of community response is huge. The current situation requires Council to work with existing trees that were not planted with infrastructure in mind.

Council's position is that it is unwise to provide or retain street trees in sites where they will have to "compete" with infrastructure.

**Underground services**

As soils are compacted, soil structure loses integrity. This affects water and air movement through the soil and hinders root growth. Foot and vehicle traffic contribute towards soil compaction and in the long term may contribute to death or decline of mature trees.


Vehicles contribute to soil compaction

[9] In 2011/12 Hall Crescent, Freyberg Street and Tyndall Street are being treated in order to reduce the risk of pedestrians tripping. This is a result of trees outgrowing the berm. A mixture of felling and road alternations will occur.

Good soil, with plenty of air space in it is critical. The quality of the berm and/or tree pit in which a street tree is planted is vital to its ability to thrive.

> *"The root zone is where half of the plant lives. Therefore the root climate is as important as the aerial climate".*
>
> Reg Lewthwaite in Treadwell, 2000

People add a variety of pressures that adversely affect the health of trees. It is now widely acknowledged that, for most species, the greatest proportion of tree roots will grow in the top 1.5m (approximately) of the soil. Therefore deeply installed underground services are not expected to be affected and services within this zone should be installed in shared ducts and/or impervious materials. Many services are laid at approximately 400mm deep.

Over time tree roots of some species can interfere with underground services (water, sewer, storm water, electricity, telecommunications and gas). Techniques that may minimize interference include:

- Select species that best fit the available space
- Install planting hole liners, root guard, deflection barriers etc to inhibit shallow root development
- Avoid tree planting where there is inadequate space

The New Zealand Standard related to drains is NZS 4404:2004. It sets out the requirements for separating trees from sumps.

Trees are easily disturbed by construction, road works, work on the electricity and telecommunication infrastructure, soil compaction, chemicals, air pollution, changes to water and nutrient supply, improper tree maintenance, and requirements for underground and overhead services. Buildings, garages and shop fronts located against the outer edge of the road reserve are also a consideration.

**Overhead lines**

Local residents frequently complain about trees being pruned to accommodate overhead lines.

> *"Trees and overhead lines have been getting in each other's way ever since the first utility pole was erected along a tree lined street … It should come as no surprise, that the public has long complained about the seeming insensitivity to trees displayed by utility pruning programs. At the same time, utility arborists have legitimate objections about common tree planting practices in utility rights-of-way. Both trees and overhead lines have a legitimate place in human communities."*
>
> US Department of Agriculture, 1993

Hutt City is not unique. Most local authorities have the same problems when it comes to street trees and overhead services. Inappropriate species have been planted under lines, and inadequate provision has been made to adjust the lines to accommodate "oversize" trees well. Equally, street tree managers have not been proactive about removing trees from under lines even when the trees will not respond well to line clearance.

Local V pruning of pohutukawa to accommodate 400V lines


Liquidambar pruning in Gisborne to clear lines

Wellington Electricity Lines Limited is responsible for maintaining safe and reliable electrical services to its customers. Their role is to distribute electricity along a network of lines. Trees growing amongst the electrical lines can interrupt supply and threaten public safety. In accordance with the Electricity (hazards from trees) Regulations 2003 Council cooperates with Wellington Electricity in order to provide street trees and electrical lines in streets.

Trees which allow people to climb in the crown and touch overhead lines are a serious concern to Council. However, Council can normally reduce this risk by pruning as part of general operational management and by planting in sensible locations. Council will progressively address inappropriate trees growing below lines and will avoid planting new trees under 11kv lines. In exceptional circumstances planting under 240v and 400v lines may occasionally take place where, at maturity, the tree will not require ongoing pruning to achieve clearance 1m below the lines.

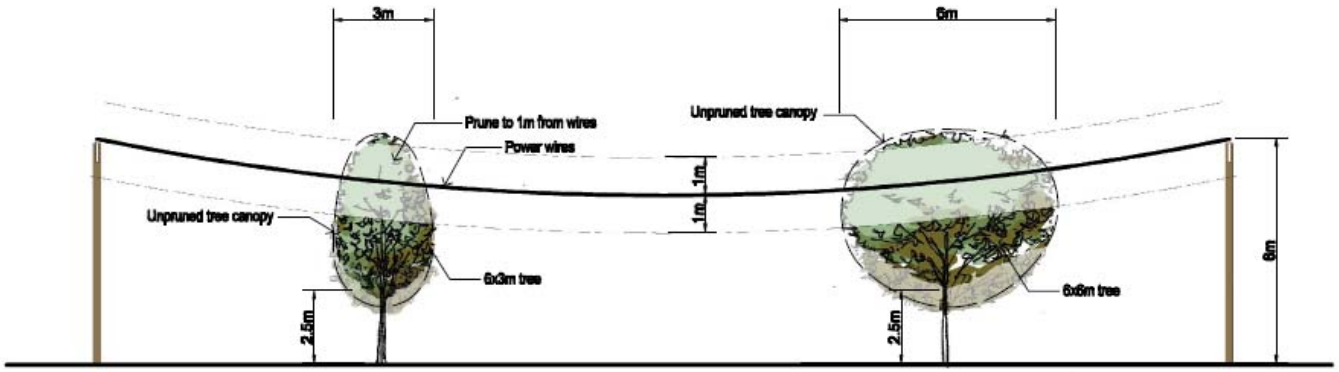



Figure 1

2 forms of small tree in a typical residential road with overhead services

The white "window" indicates the extent of pruning required to comply with the Electricity (hazards from trees) Regulations 2003.

The opportunities to grow quality specimen trees under overhead lines long term are limited. Small tree species that will "fit" under lines are unlikely to provide sufficient bulk or scale in relation to their surroundings. Small trees have little presence amongst buildings and the overall streetscape. Further to this, the requirement to crown lift for road and footpath clearance means little canopy is left and small trees struggle to achieve good form.

Compared to trees that are not growing under overhead lines, maintaining trees under lines is more costly and the chances of a quality specimen developing are lower. In all but exceptions situations, Council avoids planting under overhead lines.

Approximately 47%or 5,640 of street trees in Hutt City are growing under overhead lines. 17% or 2,040 of our street trees currently require heavy ongoing pruning to comply with clearance requirements. The annual cost of clearance to comply with the Electricity Regulations and road and footpath requirements is estimated to be approximately $134,000 or 31% of the total contract cost for the inspection and operational maintenance of street trees in 2011/12.

Theoretically 3631 street trees growing under overhead lines will require heavy ongoing line clearance in the future. The reality is that some trees are likely to be removed before they ever reach the lines because they will fail to thrive[10].

Assuming that 2780 additional street trees require ongoing heavy pruning to clear electricity lines by 2030 the operational cost of is likely to increase by approximately $181,000 annually[11] unless there is significant change to the way street trees are planned and managed.

[10] Assumption is that only 85% of 5689 trees growing under lines will survive until 2030 and require ongoing clearance.
[11] Based on 2010 estimates of $65/tree for annual maintenance of tree requiring heavy ongoing line clearance.

The increase in cost is a serious issue but the bigger concern is that Council will be paying more to provide an asset that is decreasing in quality as a result of their "natural" form being altered to accommodate lines. Many trees that require heavy ongoing pruning to clear overhead lines will not exhibit good form.

Line clearance accounts for approximately 31% of street tree contract costs annually – photo supplied by Downer NZ Ltd

V pruning to fit trees around overhead lines is not ideal but it is recognised as acceptable practise by the arboricultural industry.

V pruning is really designed to be used on juvenile or semi-mature deciduous trees. The idea is to prune and create a V shape in the crown which will allow lines to pass over or through the crown. Subsequent pruning is carried out to encourage the crown for form over the V, leaving a "tunnel" which the lines pass through. Arborists then maintain the "tunnel" around the lines. In the long term trees may regain attractive form. The likelihood of achieving a quality specimen following V pruning varies according to species as does the speed of recovery. In Hutt City pohutukawa is the species most frequently V pruned.

For street trees growing into lines, where undergrounding is not realistic, the long term solutions include:

a) continue heavy ongoing pruning involving canopy reduction, shaping and V pruning of select trees in a select street where quality trees are very likely to result; or

b) where quality specimen trees are unlikely to result, remove the tree from under overhead lines and concentrate on retaining other trees and consider planting sections of the street where there are no overhead lines; or

c) remove tree and do not follow up with replacement planting, possibly supplying trees to neighbours to supplement front gardens or private properties.

If quality is unlikely to result Council's position is that removal is normally a better option than retaining and maintaining a poor quality tree. In some special circumstances (eg little other mature vegetation locally), retaining a tree of marginal quality may be warranted in the short term in order to contribute to the local landscape.

There are some good local examples of V pruned trees which have recovered well and the new branch structure has formed well around the lines, disguising lines and contributing well to the streetscape. This usually involved species that grow to heights of at least 7m in local conditions. There are several pohutukawa in Ariki Street, Boulcott that are good examples.

Local pohutukawa which has recovered reasonably well from V pruning

Where street trees are greater than 7m in height, the prospects of growing a quality tree are greatly improved. The crown is larger and sits at a height that may encompass the lines and disguise the tunnel (containing the lines) within the crown.

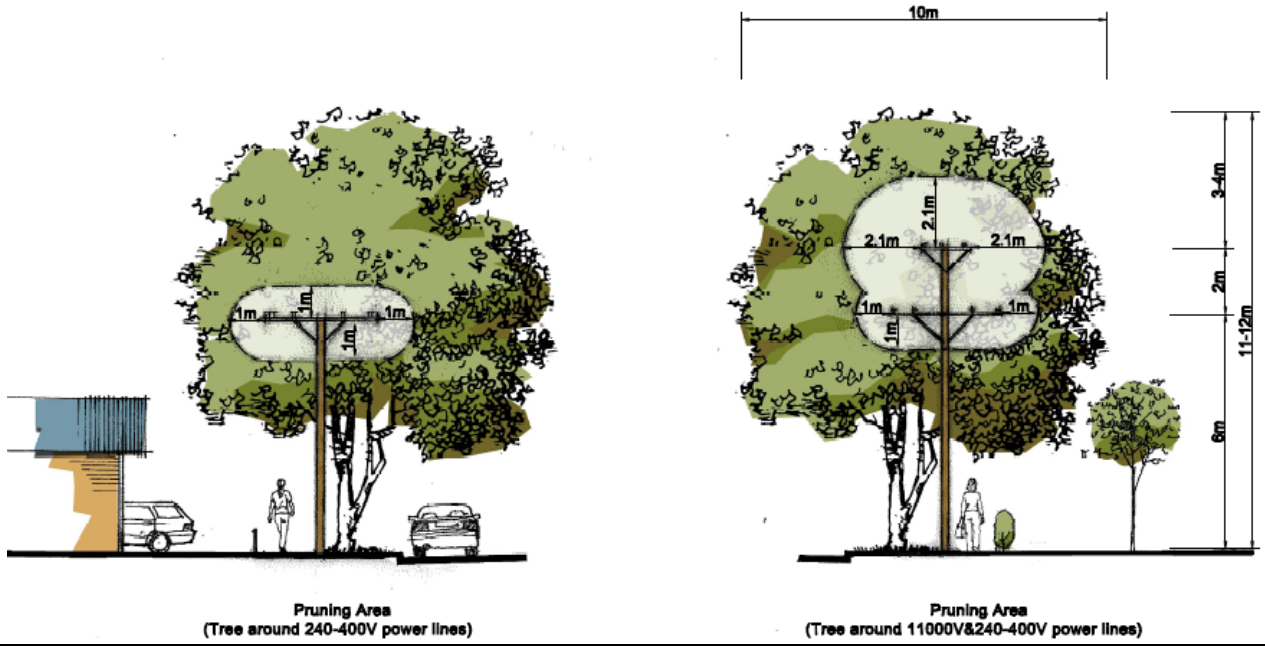



Figure 2

Street Tree pruning requirement for trees near overhead electricity lines

There are some well formed, healthy street trees planted under lines which have not reached the lines yet. Their future needs to be considered. If funding were available it is possible to

retain the “natural” form of some of these trees by considering site options, including relocating overhead lines.

Local ngaio which represents good form and health for its age. The canopy of this tree will be amongst the lines within 5 years and likely solution (based on current practise) is V pruning or felling.

Trees in this kind of situation would make a worthwhile contribution to the streetscape if overhead services could be rearranged.

Some trees will, or do already, make such good contributions to the street that they may be candidates for rearranging services, for example undergrounding or relocating overhead lines.

In terms of street tree management, it is usually preferable for electrical lines to be located underground in ducts under the road centreline. Council’s opinion is that both street trees and overhead lines are essential in our city. Clearly it isn’t always practical for them to co-exist. Unfortunately V pruning creates a tunnel through the canopy of trees and makes it challenging to cultivate quality trees. Council frequently receives complaints following “V pruning” in mature trees. V pruning does appear to be a brutal approach. Council’s contracts make provision for it to occur.

The cost of undergrounding existing electricity services is upwards of $10,000 per span between poles. In 2010 Wellington Electricity Lines Limited outlined some of the approximate costs associated with undergrounding:

| | |
|---|---|
| **400V lines** | approximate cost per span (40m), $250 per metre - $10,000 per span<br>If pole each end of the undergrounded span requires replacement - $5,000 per pole |
| **11,000V lines** | approximate cost per span (40m), $350 per metre - $14,000 |
| **Road reinstatement** | approximately $12,0000 for residential road (40M) and $16,000 for main road |
| **Berm sub in lieu of pole sub** | approximate cost of relocation and new facility $40,000 |

| | |
|---|---|
| **Additional Costs** | Install new pillars at every second house $3,000 per pillar ($1500 per house)<br><br>Underground domestic services from overhead to underground $800 to $100 per house |

**Road and Footpaths**

The basic function of road reserves is obviously utilitarian. Road reserves are primarily areas dedicated to providing facilities for vehicles, cyclists and pedestrians. Road reserves host drains, electricity lines/equipment and telecommunication lines/equipment. Outside the area dedicated to vehicles and services, it may also be possible to provide a safe and pleasant place for residents to walk, exercise, talk to neighbours and generally enjoy the amenity values.

In the road reserve, vehicles are normally the top priority. Council must balance the desire for street trees with other infrastructural and neighbourhood needs. It is a practical reality that provision for street trees needs to be aligned with City's roading hierarchy.

Streets contain bollards, signs, service poles, overhead and underground services, communication boxes, electricity transformers, car parks, street lighting, traffic lights etc.

Local street tree, which was planted in 2008, after the pole was installed. The solar powered speed sign was installed in 2009. The tree will eventually interfere with street lighting, the sign and overhead lines.

Clearly placement of trees needs careful consideration and some components of the streetscape may need to be rearranged in order to create a good place for a tree. If this can't happen or if the tree won't thrive or will interfere with existing services or surfaces, it probably indicates a need to rethink the species or site. It's just not practical to provide trees in some locations.

Buckled surfaces create trip hazards and compromise the longevity of the footpaths and roads. Planting time offers the best opportunity to prevent conflict between trees and pavement, or at least delaying, this type of damage.

Footpath and kerb in Freyberg Street damaged by tree, photographed 2011

Local kerb and footpath renovation using material which accommodates some further expansion of root structure

Street trees normally require pruning to clear foliage and limbs away from pedestrians and vehicles. The species, width and layout of the road reserve and the position of trees in the road reserve all influence the pruning that will be required.

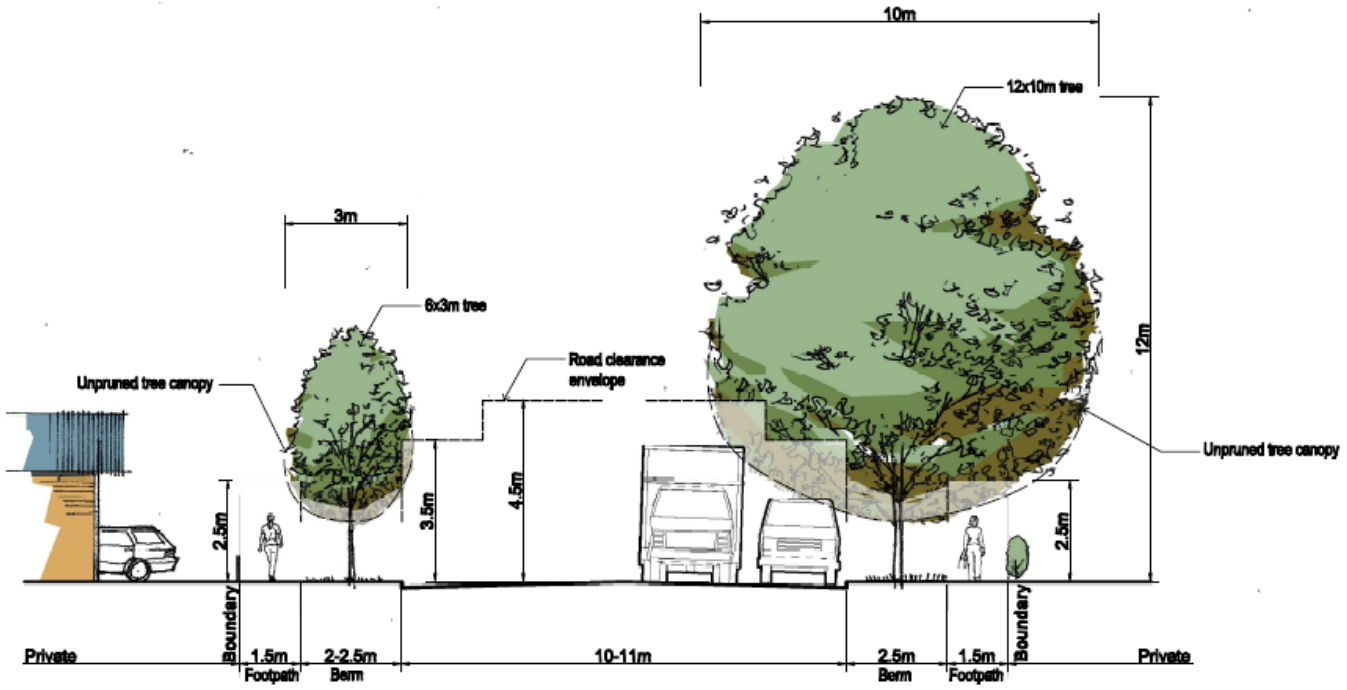



Figure 3

Small and large tree in typical residential road illustrating clearance required for vehicles and footpaths

**Planning and Design**

Walking along or past a tree lined street is pleasant, some would say welcoming. Using Ward Themes as guidance, Council will develop street tree master plans for phasing tree removal, replacement and new plantings as well as special options for specific trees which do or will contribute significantly to local streetscapes if they do not have to compete with infrastructure. The advice of experts will be a leading consideration but there will be opportunities for residents to participate in the street tree planning process for streets where there are two or more equally valid options. Council will concentrate its efforts on:

- Cease use of poorly performing species and favour species suited to site conditions which will meet the criteria for quality street trees[12]
- Remove poorly performing trees and trees that are unlikely to develop into quality specimens
- phase out street trees which require heavy ongoing pruning when a quality specimen is unlikely to result
- find bespoke solutions for situations where street trees are interfering with infrastructure eg tree roots damaging footpaths

[12] A quality street tree is one that is 7 to 15m tall and is in good health and displays good form

- prioritise street tree improvements to popular walking and cycling routes and routes that link key community facilities, eg schools, parks, sports grounds, pools, transport and shopping hubs, working in with Council's Road and Traffic Division

Prior to 2010 the street tree asset was being managed in an ad hoc style. The main reason for this is probably that a long term overall design or objective had not been developed. In 2010 Council recognised that a more strategic approach was required and adopted this Urban Forest Plan. It establishes the orderly arrangement of the street tree asset in terms of policy, funding, attention to large scale problems.

Decreasing section sizes provides fewer opportunities for large trees on private property and more vehicle crossings and dwellings in neighbourhoods reduce sensible locations for street trees. Population density is greatest in the Central Ward in Hutt City. 2006 census forecasts indicate the population in this are is likely to intensify further and by 2031 the most densely populated areas of the city will be Avalon South, Epuni West and Waterloo West. It seems likely that most new dwellings in this area will be a result of infill subdivision.

Residential development of 3 or more dwelling houses on any site is a Restricted Discretionary Activity under 4A 2.3 of the District Plan from 1 December 2011. As section sizes decrease towards 300m² and 400m² in General Residential and Higher Density Residential Activity areas it will become more difficult to retain large trees on private properties in these areas[13]. The resource consent process associated with subdivision provides Council with some opportunity to protect vegetation and specimen trees on private properties but overall street trees, trees on urban reserves and trees on larger private properties will have an increasingly important role.

Council views street trees as an important element in the streetscape and the fabric of the urban area. Species are selected on the basis that quality street trees help suburban areas to be attractive, inviting, restful, relaxing, green, leafy places. Council has agreed that a high proportion of mature trees in the 7 to 15m height category will provide adequate bulk and height in the streetscape to make a positive contribution. Trees above and below this range will feature in the streetscape but in smaller numbers. Trees above 15m are likely to require sites larger than most berms offer. They may also interfere unreasonably with residents' enjoyment of their own properties. Trees lower than 7m are unlikely to make enough contribution to the streetscape to be worthwhile. Requirements to clear vegetation from roads and footpaths and overhead lines favour trees above 7m.

Many of our street trees are being pruned to achieve clearance from footpaths and roads as well as overhead lines. The diagram below illustrates that the scope for providing attractive street trees under overhead lines is limited, particularly for small species.

[13] As at 1 December 2011 Chapter 4A 2.3 of the District Plan – City of Lower Hutt made provision to treat residential development of 3 or more dwelling houses on any site as Restricted Discretionary Activity and this could increase population density.

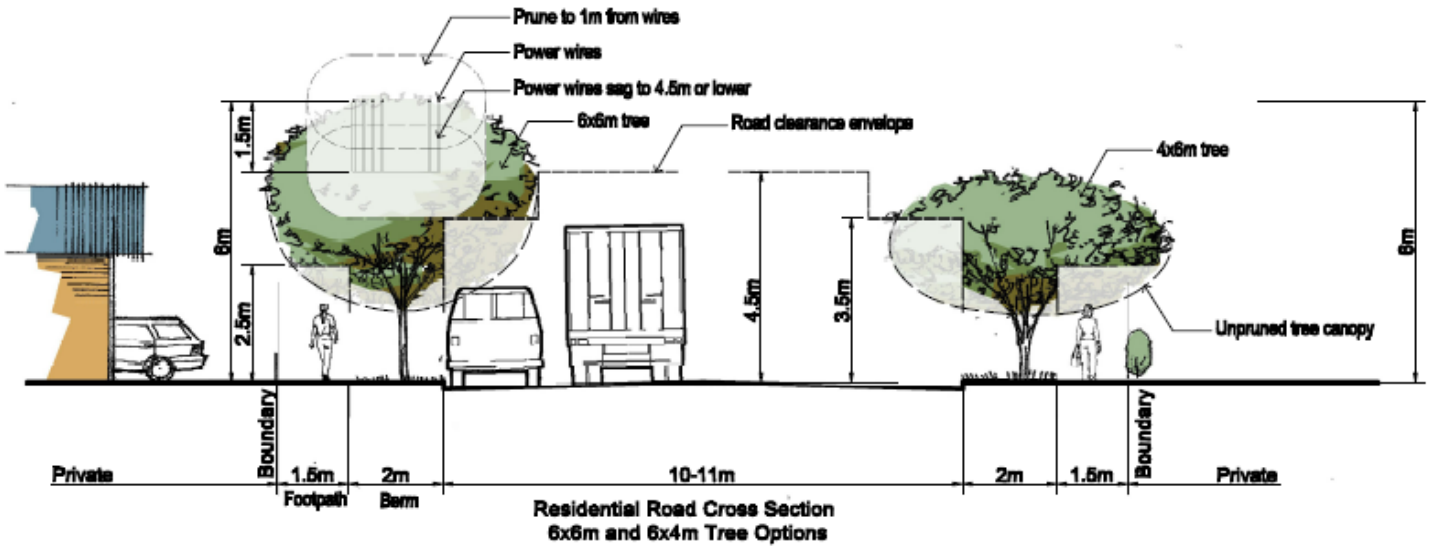



Figure 4

Pruning required where overhead and vehicle clearance is required

Berm[14] size is often the limiting factor at a site where tree planting is being considered. In Hutt City berms range from narrower than 1m to wider than 3m in width. 58% of our berms are wider than 2m. Some streets, particularly in our hill suburbs and in rural areas, do not have berms.

In general, berms of less than 2m leave little opportunity for quality trees to establish. Berms of 2 to 3m offer good space for a range of large species that perform well locally. A pohutukawa requires a berm width of over 3m. 33% of our berms are 3m or wider.

It is not practical or necessary to grow street trees along every street. It is not normally desirable to provide a street tree in front of each property, in some cases a little goes a long way. It's about perception. Overdoing it is unnecessary and too demanding on future public resources. Clever use of corners and pockets along streets can give the perception of a well treed street without planting the entire street.

In some streets it may be possible to provide specimen trees in front gardens in order to provide quality vegetation which will contribute to the character of the street. If tree opportunities on the berm are limited this may be a practical way to give the perception of green, leafy streets. The height of these trees can vary more (below approximately 15m) because they will be set back from the street and the clearance requirements will have less effect.

Brookes and Crowe are well known English Garden Designers who have written extensively about garden design. Their material is really geared towards gardens, but the classic landscape design principles they refer to also apply to street trees. Professionals in the landscape and horticultural industry continue to refer to Bookes and Crowe.

[14] "Berm" refers to the grass verge between the road edge and footpath within the road reserve area

The following quote by Crowe, although over 40 years old, remains relevant:

> *"But there are many gardens today which have been spoilt by the introduction of purple, golden and glaucous blue foliage in the wrong place. The colours are not necessarily bad in themselves, but where trees for the green framework of the garden or the link between garden and country, a sudden spot of purple or gold destroys the composition just as surely as the appearance of a Georgian House would be spoiled if a small portion of the brickwork were painted bright green or blue to relieve the monotony of the old red brick. ... The function of a background is to harmonize the view; it must be restful and it must recede rather than jump forward to the eye."*
>
> Dame Sylvia Crowe, 1968

Both Brookes and Crowe emphasise the importance of landscape design achieving visual peace and restfulness with tones of green in order to fuse the surroundings and buildings with the soft landscape. Brookes advises using limited species and being careful with colour displays.

Glyn Church, a well known Taranaki based horticulturalist, claimed that:

> *"Foliage gives us shape and texture as well as colour. Foliage grows on you. When you start gardening you are impressed with big colourful flowers and, as time goes on, you become more intrigued by smaller and more subtle blooms. Finally you become fascinated by leaf shape and form. You know you have become a plant fanatic when you get excited about branches and trunks and the sunlight on bark and stems."*
>
> Glyn Church, 2002

Council has agreed that the street tree asset will predominantly rely on green foliage, form, size and good quality and that consideration of these features should lead species selection.

Care needs to be taken with the use of green, especially very dark green evergreen species to avoid a heavy atmosphere. Requirements for "hits of colour" can be met in private gardens and urban parks. As Crowe and Brookes have explained, use of eye catching colour isn't suitable for repeated use along a stretch of street. Autumn foliage display is a seasonal exception but trees would be planted for form, size and foliage in the first instance; the autumn foliage display is an added bonus from species such as liquidambar. Floral display, for example pohutukawa, is an added bonus from a species that contributes so much (in the right site) year round with its form, size and foliage

From 1 January 2010 Consideration of scale, form, balance, rhythm, texture, colour, location and likelihood of producing quality trees in the long term will are important considerations. The requirements of the neighbourhood will also add to the mix of considerations.

In 1993 the US Department of Agriculture stated that "While having similar maintenance considerations is a primary consideration in species selection, large-scale monocultures should be avoided". This statement is still relevant in our City. 45% of our street trees are comprised of only 5 species. If pest, disease or climate caused the death of just one of these species, say pohutukawa, this could result in the loss of 16% or 1984 individual street trees. Neighbourhoods in areas like Eastbourne, Waiwhetu, Waterloo and Woburn would suffer noticeably.

Council intends to create more distinction between streets by using a more balanced range of species in a coordinated way. A selection of species that perform well in each Ward will be developed and this will be used in the Ward Theme that each Community Committee or Community Board adopts.

Council's desire is to achieve typical or "natural" forms that are appropriate for species. The influence of wind locally is noticeable in many species, for example, liquidambar specimens growing locally often develop crowns that are far more round in shape than the more typical conical crowns in less windy climates. Locally we accept the rounded crown although it is not truly typical for liquidambar. At an operational level, the tree contractor is directed to achieve typical shapes for each species as part of the maintenance regime.

While Council and the tree contractor aim to achieve "natural" forms typical of the species, this is not always possible. For example, locally the crown of mature golden elms reach diameters in excess of 20m. Golden elms in a street tree situation require extensive ongoing pruning to manage the crown's wide growth habit and comply with road clearance requirements. The result is heavily pruned specimens with atypical forms.

Golden elm, heavily pruned street specimen under wires, 8x8x3m

Medium term prognosis – remove

Mature Golden Elm in park setting, 23x23x8m

Long term prognosis - retain

Council understands that a range of native, particularly local native, species that will perform well as street trees is limited. The range of exotic species that are known to perform well in streets is much wider. Where the site suits, native and local native tree specie could be favoured in street tree master plans. Council's desire is to improve the representation of local native species but this will not be at the expense of quality.

Ideally the same species should be used along both sides of the street, or blocks, to achieve visual balance, rhythm and continuity. The reality is that there are likely to be few streets where it is sensible to provide a textbook layout. Clearly the mixture of existing quality specimens is also an important consideration. Berm width, seasonal food requirements of wildlife, underground services and overhead services often require a compromise on this ideal and this is acceptable to Council. For example, incorporating kowhai and lacebark in a

street tree master plan could provide an attractive and practical way to improve food for birds in a neighbourhood for a longer period than a single species would allow.

In some areas of the City street trees compensate for underdeveloped private gardens and these areas warrant special consideration. Council may consider the concept of enhancing private landscapes in some areas so that the combined effect of street trees and/or trees on private properties enhances the character of the neighbourhood and streetscape.

278 (30%) of streets in the city do not have street trees. Not all streets require street trees. Not every property in a street needs a street tree outside it. It is not always practical (or necessary) to provide a balanced layout of street trees along the entire length and on both sides of a street. The aim is to give the perception that the street is leafy, green and pleasant. The space between trees will depend on the site and size of species. Large trees can be spaced further apart. Planting smaller trees at the same spacing may appear stingy and give an inadequate effect.

Unlike many other New Zealand cities, most parts of our City have, or will eventually have, a nearby, backdrop of native bush. Because of the large quantity of bush visible from suburban areas, there is less need for street trees.

Tree planting should take into account view corridors from the City to the Hills. These corridors are important in terms of sense of place and new street trees could inadvertently interfere with some view corridors. Where it is impractical to provide street trees, views of vegetated hills may compensate partially. Bush views contribute to the perception of green, leafy suburbs.

In some streets, where character is required, it may be possible to gain this by providing art in public places. Trees provide a strong vertical element to the landscape but they struggle in some locations. Tall sculptures may fulfil a need for a vertical element as well as enhancing a distinctive identity and “sense of place”. This approach has been adopted along the Petone Foreshore and several tall, slim pieces were installed between 2000 and 2006. There is little public art available in suburban areas and provision in the central city is light.

Lighting trees as night time features needs to be considered carefully. Lighting large, healthy, well formed street trees can produce a spectacular night time display in key areas. On the other hand trees can reduce the benefit of street lighting for vehicles and pedestrians.

A more intelligent approach to tree selection is required in order to create and maintain the maximum amount of benefits (visual, climatic, character setting) while balancing the operational costs and long term requirements of the City. There is an obligation to provide current and future ratepayers with quality street trees and few street tree problems.

Tree selection needs to be based on: the site (including underground and overhead circumstances), design considerations, maintenance considerations. Consider paving with surfaces other than asphalt and concrete when footpaths are renovated to cater for tree growth, eg cobblestones.

Ward Themes and Street Tree Master Plans will:

- investigate opportunities to improve interfaces and entrances with urban parks with street tree planning.
- Look for opportunities to create a non-competitive “understory” beneath and around trees to buffer environmental effects
- Develop a long–range tree replacement or rotation plan and budget
- Look for sustainable, long term options eg no need for irrigation beyond say first 2 years in the ground, low susceptibility to pest and disease attack, potential for the tree to remain on site until senescence
- Identify a few icon species for each ward, covering small, medium and large tree options
- Prioritise design that avoids interference with infrastructure

**Trees living with wind**

It is important that the effect of wind at a site is considered as part of street tree management and planning. Wind makes a significant contribution towards the lack of quality in our current street tree asset.

Strong, gusty winds are a feature of our local climate and this is demonstrated by the form and health of some street trees in many areas of Hutt City. Some species cope with wind successfully, while others manage to survive and adapt to accommodate the wind but do not thrive. Plane trees, prunus and most deciduous trees are not tolerant of wind conditions in local streets. Liquidamabars do no normally display the typical, conical shaped crown. Locally, they develop a rounded crown as a response to local wind conditions, for example Tennyson Street, Avalon.

With the exception of the urban area of Wainuiomata, street trees in southern areas of the City are exposed from salt laden winds - predominantly in winter.

Exposed street trees are subject to extreme wind conditions from time to time. Trees are able to produce adaptive growth responses to climatic conditions such as wind. Wind stresses are one of the catalysts for specific growth processes often referred to as reaction wood. This reaction wood can develop in both trunks and branches, with some trees responding better than others. Reaction wood develops with incremental growth of trees to ensure stability and support of the canopy from juvenile stage to maturity. The larger the tree and more exposed the site, the greater the development of reaction wood to improve the structural integrity.

Fortunately for trees, Hutt City is low-rise. Unlike higher cities, for example Sydney, our city is dominated by 1 or 2 storey buildings. Currently few of our street trees face the problem of significant shading, or wind velocities accelerated by clusters of tall buildings. They do however; face usual street tree constraints such as harsh climate conditions and limited space.

Street trees are classed as ‘open grown’ trees (as opposed to trees grown in stands or forests). To maintain stability and vitality most street tree species should grow with a high live crown ration. This is the amount of foliage canopy in relation to the height of the tree. 50 to 80% is the ideal range, depending on species. The comments that a tree should be pruned because it is “too big” will often involve the removal of an unreasonable amount of canopy which can undermine the health and stability of a tree.

The growth characteristics and physiological development of different species can make some trees more prone to limb failure, pathogens and decay. As a general rule trees that grow fast have poor defences and are more prone to pathogens and decay. Examples of species growing locally are poplar, willow and alder. Slow growing species tend to allocate a higher proportion of resources to defences, have stronger branch attachments and greater structural strength, for example some oaks, some elms, some ash and pohutukawa.

### Fruit trees as street trees

During consultation on the Draft Urban Forest Plan officers were asked about the possibility of using fruit trees as street trees. By adopting this Urban Forest Plan Council has accepted that, although the concept of establishing fruit trees along city streets sounds attractive, there are unfortunately many practical reasons why Council avoids using them as street trees. Four compelling reasons for not attempting to use fruit trees in berms are:

1. Most commercial fruit trees are not of an appropriate size or form for street trees. They are unlikely o achieve quality.
2. Fruit trees used as street trees would be excessively expensive to develop and maintain as a result of varieties being developed with fruit production as a priority.
3. The Hutt Valley climate does not favour fruit tree establishment and performance, particularly in road reserve
4. Fruit trees will not support and develop biological diversity within our city. They would occupy spaces that could support more useful specimens.

In general, Council will not use fruit trees as street trees. Where it can be established that a fruit tree is likely to achieve quality, it may be considered but its productive ability will not influence the selection. The reality is that pear, apple, citrus, stone fruit are not street tree options in our city. It may be possible to use a limited range of nut trees.

Council’s view is that private gardens offer superior conditions for growing fruit trees.

### Public response to street tree management

Most people appreciate the value of trees and like (or would like) having them in their street. Until 2010 inaction was gradually complicating the management of Hutt City’s street trees. Big issues, like declining quality and increasing number of trees requiring line clearance were not being addressed.

Appropriately resolving tree issues, particularly along large sections of a street, will create controversy because many people have a strong emotional attachment to the trees in their street. On the other hand there are likely to be some people without this attachment who view the situation objectively.

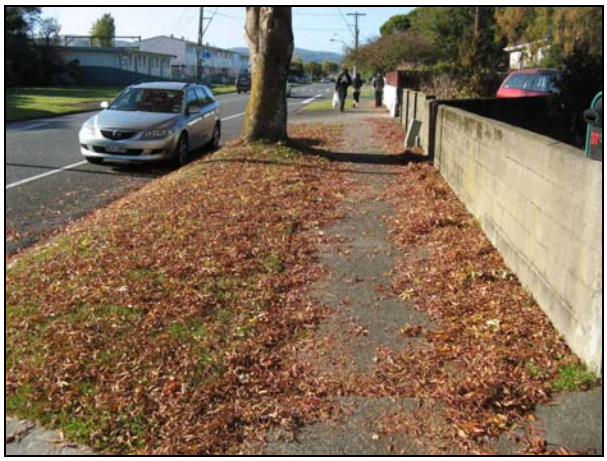
Not everyone appreciates or wants street trees.


Cartoon from Taylor, 1976

It is more difficult for the general public to consider local tree matters with the same level of objectivity than they would for renewing an aging water main. In other words, the community liaison involved in managing a street of mature trees, which are problematic, is likely to be much less straightforward than renewing a water main in the same street because people tend to respond emotionally to tree issues. This is where an experienced and qualified arborist would make a lot of difference to the management of Council's street trees.

If the number of quality[15] trees sits at approximately 7,200 (increase of 5,988) by 2030 it is likely that neighbours' complaints about leaf litter on road reserve and private properties will increase.

[15] A quality street tree is one that is 7 to 15m tall and is in good health and displays good form



Leaf litter. An attractive seasonal indicator to some, an ongoing irritation to others.

Leaf litter is generated by evergreen species year round. However it is the sudden, seasonal drop of leaf litter from deciduous trees than is a frequent source of complaint. Leaf litter can be a problem but Council accepts that the problem is easily outweighed by the benefits generated by trees. This is unhelpful to those individual property owners dealing with leaf litter annually but at a city-wide level is acceptable.

7,200 quality trees = 60% of 12,000 trees (future target)

1212 quality trees = 10% of 12,106 trees (current situation)

**Public response**

Council can improve the way it communicates the value of our street trees and the benefits they bring to our community. We can also provide better information about what Council is trying to achieve with street trees. This will help people to understand the way we manage street trees and Council's priorities for street trees.

Improving the quality of our street trees on a whole street basis is a very important objective of the Urban Forest Plan. One of the ways this will be achieved is by managing street trees with a focus on the principles of asset management. This requires expert technical and professional input. In streets where there are a number of valid options it is desirable for Council officers to work with residents to develop a street tree master plan.

It is important to determine who should be involved and who should make the decisions. Residents, Community Committee members, Community Board members, Councillors, contractors, consultants, Council officers all have roles to play in the development of Ward Themes and Street Tree Master Plans[16].

Some street tree decisions are made by officers or the contractor and simply require notification. This involves providing neighbours with information about proposed works and timing. Other street tree decisions warrant consultation and/or negotiation with neighbours. Where there are choices, Council will normally favour consultation as part of the Street Tree Master Planning process.

[16] Council adopted the Process for Ward Themes and Street Tree Master Plans on 26 July 2011 to guide street tree planning and confirm decision making responsibilities

The Urban Forest Plan's long term focus on providing quality street trees following an asset management planning approach will simplify many decisions. From 1 January 2010 there will be less consultation on the future of individual trees and more consideration of expert advice, for example arborists, engineers, landscape architects. A whole street perspective will prevail.

**Management**

As a result of the 2008/09 street tree survey Council now has an electronic record of all of street trees. It is currently held on an Excel spreadsheet by the Parks and Gardens Division of Council. Data from the spreadsheet can be mapped.

Records of street tree maintenance are held in the RAMMS (Roading Asset Maintenance Management System) and Council's tree contractor, Downer New Zealand Limited, updates the data as part of their operational work.

In the near future the tree contractor will use hand held technology to record and update maintenance records on site. This will enhance the contractor's reporting.

If funds were available, the first choice in managing many existing mature trees to achieve quality (height, form and health) would be to consider undergrounding or relocating overhead services. In some streets a strip of good quality trees may be so valued that Council and the service provider are willing to consider relocating the overhead service underground. In other streets options may include:

- Removal of trees from line side of street so that the line/tree conflict is removed
- Retention of trees and acceptance of V pruning practice

Council will take a cautious approach to tree selection. Where there is a suspicion that a species has potential to become a pest species Council will avoid selecting it. Council does not want to be responsible for introducing or spreading plant species into streetscapes, which then migrate into private property or public open spaces, particularly natural areas. As Council develops Street Tree Master Plans problematic species will be phased out. Council's preference is to remove existing problematic species rather than maintain them.

Species which are currently considered problematic include sycamore, karaka, poplar and Eugenia smithii. There are others.

Council has high numbers of a few species of street trees. This is a risk to Council. Council will reduce the risk of losing large numbers of street trees to pest and disease by limiting the number of any one species and genera.

Prior to 2011operational management of Street Trees was carried out in accordance with Council's 1994 Tree Maintenance Policy. The Tree Maintenance Policy had a strong customer service focus and set out how Council would respond to issues concerning individual trees. The Urban Forest Plan, with its long term focus on whole streets, tree quality and overall asset management planning was not reflected in the Tree Maintenance Policy[17].

[17] Council adopted the Operational Guide to the Urban Forest Plan on 26 July 2011, making the Tree Maintenance Policy redundant.

Street trees are a significant asset and this significance needs to be recognised in the planning and management of the asset. The street tree asset has historically sat with general horticultural functions rather than being treated as a discrete and specialised asset and this warrants consideration. A qualified arborist, dedicated to street trees and trees in urban parks city-wide would offer great benefits to current and future residents.

## Theme

Council views street trees as an important element in the streetscape and the fabric of the urban area. Species are selected on the basis that quality street trees help make suburban areas attractive, inviting, restful, relaxing, green, leafy places. The interaction of the built environment (particularly the residential areas) needs to be taken into account – scale (a sense of proportion to the surroundings), shading, views, overhanging limbs and the proximity of dwellings in relation to street trees.

Council has agreed that a high proportion of mature trees in the 7 to 15m height category will provide adequate bulk and height in the streetscape to make a positive contribution. Trees above and below this range will feature in the streetscape but in smaller numbers. Requirements to clear vegetation from roads and footpaths and overhead lines favour trees above 7m.

Trees above 15m are likely to require sites larger than most berms offer. They may also interfere unreasonably with residents' enjoyment of their own properties. Trees lower than 7m are unlikely to make enough contribution to the streetscape to be worthwhile.

In some streets it may be possible to provide specimen trees in front gardens in order to provide quality vegetation which will contribute to the character of the street. If tree opportunities on the berm are limited this may be a practical way to give the perception of green, leafy streets. The height of these trees can vary more (below approximately 15m) because they will be set back from the street and the clearance requirements will have less effect.

**Key Strategies for Street Tree management**

- Realign street tree management from a focus on customer service and individual trees to a professional approach based on the principles of asset management and sound landscape design, emphasising the need to consider whole streets
- Comply with the requirements of the Electricity (hazards from trees) Regulations 2003.
- Limit risk of street tree loss to pest and disease
- Avoid planting under overhead 400V and 11,000V overhead electrical lines
- Promote the benefits of providing quality trees[18] and promote the concept that it is better not to have a street tree than to have one of poor quality
- Improve the speed of phasing out poor quality specimens and specimens that are unlikely to develop into quality specimens
- Allocate new funding for a qualified and experienced arborist to implement street tree components of the Urban Forest Plan Develop
- Develop a preferred species list and guidelines for street tree planting locations at officer level and plant new street trees in accordance with them[19], prioritise a green foliage display
- Trial the street tree master planning process in Karamu Street, Eastbourne - acknowledge that for many streets, there is no simple answer and unique solutions will be needed[20]
- Develop Ward Themes, starting with the Central Ward[21], and follow up by developing and implementing Street Tree Master Plans for individual streets (or sections of long streets) using the newly developed preferred species list and guidelines for street tree planting locations

## Contribution from other property owners

Where private properties provide (or could provide) specimen trees facing streets, Council needs to consider whether there is a need for street trees. It may be more practical to provide specimen trees private property. Alternatively it may make more sense not to plant or retain street trees in order to allow large specimen trees in private properties to flourish and benefit the neighbourhood. Vegetation on private property makes a tremendous contribution to the character of neighbourhoods in Hutt City. As a general rule our most established and valuable residential areas of the City also contain good numbers of mature specimen trees. Hutt City's District Plan recognises the value of this mature vegetation.

[18] A quality street tree is one that is 7 to 15m tall and is in good health and displays good form
[19] Preferred Species List and Guidelines for Street Tree Planting Locations were completed in 2011
[20] The Street Tree Master Planning process was trialled in Karamu Street, Eastbourne and in January 2011 resulted in physical works (including 11 mature pohutukawa being felled)
[21] Central Ward Theme was adopted by the Central Community Committee on 21 November 2011

Modest front fences allow private vegetation to contribute to the streetscape. In the General Residential Activity Area of the District Plan, there is provision for 2m high front fences. Because most properties do not have front fences to this height the public are able to view and enjoy the effect of many front gardens.

Perhaps this street tree, planted in 2008, is not required. The garden behind makes a good contribution to the character of this street and the overhead wires above will inevitably mean higher maintenance costs and a poor quality specimen

Central city streets like Woburn Road and Knights Road do not contain street trees and yet the perception is that the neighbourhood is green and leafy[22]. This kind of effect could be copied in other streets where it is impractical to plant in the road reserve. Some argue that this is not a very secure solution because, with the exception of protected specimens, private property owners could fell the trees. They suggest that any revision of the assessment method for selecting Notable Trees for the District Plan consider a trees' contribution to the streetscape as a factor. One submitter to the Draft Urban Forest Plan specifically noted that reliance of private trees to soften the built environment is not ideal.

Some private property owners value the tree outside their place so much that they may be willing to contribute towards the cost of undergrounding or relocating services to allow the tree to thrive, possibly avoiding the need for felling. Council is interested in cooperating with these residents. In most circumstances the cost of altering services is prohibitive and Council could only participate in a service relocation scheme in exceptional circumstances. Currently there is no specific budget for this work, however it may be possible to satisfy a small number of modest requests from existing operational budgets.

Relocating services underground does not eliminate trees and services interfering with them but it does improve the form of the above ground portion of trees.

[22] Chapter 4B of the District Plan – City of Lower Hutt contains rules for the Special Residential Activity Area. This covers areas of Central Lower Hutt, Military Road, Hathaway Road and Lowry Bay and sets a minimum lot size of 700m². One of the objectives under 4B is to protect special amenity values, including mature vegetation.

# Community participation

*"Protecting the full diversity of Wellington's flora relies heavily on the knowledge of a small number of people who have recognised the problems and gone out of their way to avert extinctions."*

Gabites, 1993

Hutt City is very fortunate. Many of these experts are residents in our City. Their knowledge is tremendously valuable to Council. Council must continue to encourage these people to contribute their knowledge and participate in the planning, management and promotion of Council's urban forest.

## Conservation movement

*"Almost half of our native birds have become extinct." Dawson , 2004*

The government and acclimatisation societies introduced a variety of mammals to New Zealand. Many of these species thrived in New Zealand's forests. Certainly by 1945 to 1955, when the Forest Service surveyed indigenous forests, it was well known that introduced mammals were causing extensive damage to forests.

"By the end of the 1960s there was a worldwide expansion in the appeal of environmental concern and conservation aims" Fleet This was reflected in New Zealand society too and "Many people became more interested in the dwindling remnants of native forests and their associated fauna." Fleet

*"Conservation efforts have shifted in recent years. The focus has moved from the conservation of species to the conservation of habitats and then to the conservation of ecosystems. Current efforts are aimed at the conservation of biodiversity, which incorporates species, habitats and ecosystems."*

Clover and Botherway in Spellberg et al

Today, the Lower Hutt Branch of the Royal Forest and Bird Protection Society of New Zealand is the most influential conservation group in our City. Forest and Bird members have assisted with producing sections of this document. Their volunteers are active in the field, carrying out practical project work on sites and also lobby and advocate for conservation matters.

Examples of other local groups involved in conservation include:

Eastbourne Dunes Protection Group

East Harbour Environmental Association

Friends of Belmont Regional Park

Friends of Waiwhetu Hayward Scenic Reserve

Korokoro Environmental Group

Mainland Island Restoration Organisation (MIRO)

Friends of Petone Beach

Rimutaka Forest Park Charitable Trust

## Volunteer opportunities

In Hutt City the opportunities for community participation are most prevalent in Natural Areas. In terms of physical "work" Horticultural Parks and Street trees are less able to cater for volunteer contributions. Horticultural parks tend to be well vegetated and there is little new work taking place. Technical work alongside the road tends to dominate street tree maintenance. Residents also volunteer by reporting problems with trees and watering trees over summer. Revegetation and pest control carried out by volunteers in natural areas makes a significant contribution. This work is managed by the Volunteer Coordinator in the Parks and Gardens Division of Council.

Community planting assists with generating community identity, cooperation and may provide a catalyst for increased social connection in neighbourhoods. It may also demonstrate a neighbourhood's support and commitment to the planting and may reduce loss or damage caused by theft or vandalism.

Organisations like the Rimutaka Forest Park Charitable Trust, Inc. provide opportunities to learn about the structure and function of forest, shrubland and stream ecosystems.

## Private land owners

In Hutt City many land owners demonstrate high levels of ecological commitment.

Queen Elizabeth Trust open space covenants apply to 4 properties in our city and protect small areas of habitat between Stokes Valley and Eastbourne[23].

Clearly flora and fauna do not take any notice of Hutt City's territorial boundary and it will be increasingly important to work with landowners (private and other public agencies) on pest management and revegetation initiatives,

Perhaps it is worthwhile considering whether Council has a role to play in influencing what private property owners do with their own (unprotected trees). At this time officers are inclined to respond by saying that they are unable to deal with all the tree issues on Council land currently and they could not provide a good service to private landowners too. In time this may change and if Council appoints a City Arborist the first step in assisting other landowners might be offering a low key advisory service to schools, golf courses, churches and the hospital. These organisations manage larger properties, which often host (or could host) trees capable of contributing significantly to the city's urban landscape.

As a strategic response, in line with Street Trees asset planning, a City Arborist could work with key private property owners. Where trees are required in a neighbourhood, but the street is unsuitable, the front gardens of some private properties may provide an alternative location for well chosen and well located specimens which will add to the streetscape.

Where a private property is well treed, particularly in the front garden, it may be unnecessary or superfluous for Council to plant street trees on the adjacent berm.

[23] In 2011 acquired and classified as Scenic Reserve under Section 19(1)(a) of the Reserves Act 1977 one of these covenanted areas (17 Horoeka Street, Stokes Valley).

Council should remove the street tree. It is a poor quality specimen, requires heavy ongoing pruning and the tree inside the fence is superior.

Surveying in 2008 and 2009 indicates that 9% (1116) of street trees were probably planted by neighbours or are being maintained by neighbours. Education is required in order to maximise the benefits neighbours can offer trees. Contributions such as a few buckets of water through the summer and reporting problems are valued by Council.

Crude pruning, likely to be done by neighbours

Inappropriate berm planting by neighbours

There are opportunities for Council to:

- Encourage neighbours of street trees to take on a little “ownership’ for the tree outside their place. This could include a little summer watering or even just reporting problems to Council
- Discourage neighbours from planting their own material in the berm without prior approval from Council, the landowner
- Discourage neighbours from line trimming around the base of trees and bumping them with lawnmowers
- Discourage neighbours from pruning street trees. Their rates are paying for the tree contractor. Let the contractor’s qualified and capable staff take responsibility for pruning

## Protected Trees

The assessment method for assessing trees for protection under the District Plan takes historical elements into consideration. Many trees protected by the District Plan under Chapter 14G have known provenance. Protecting trees with historical values is one way of retaining a link with the past. Currently the stories associated with the protected trees are not promoted, nor are they easily available. Because Council is picking up the cost of maintaining protected trees, it ought to find a way to inform residents (not just the owners of the protected trees) of the special qualities or history of protected trees.

Note that the cost of annual inspections and the associated operational maintenance work on notable trees (those protected by Chapter 14G District Plan – City of Lower Hutt) is covered by Council. Protecting a tree usually limits the development opportunities on the property and this may have a negative effect on property value.

In reference to tree protection as part of property development, the US Department of Agriculture consider “The tree should survive in the new landscape for a considerable length of time to warrant the cost and effort of protection.” Further to this they note that “Young vigorous, healthy trees are the best candidates for protection, because they grow new tissue quickly and adapt readily to new environments. However it is large, old trees that are most often the focus of preservation.” The likelihood of trees surviving in good condition needs to be considered when the combination of tree protection and development is likely. “Roots can extend far beyond the dripline[24], as much as two or three times the diameter of the crown.” US Department of Agriculture, 1993.

In general, outstanding trees on private properties that offer benefit to the general public, from the street or another public viewing point, should be assessed more favourably than those trees that the public will not benefit from.

In 2008 arborist assessments of Hutt City’s notable trees estimated that life expectancy of most of those trees was 20 to 30 years, some even longer.

[24] The “dripline” is the area directly located under the perimeter of the tree canopy.

Changes to Council's District Plan tree rules occurred as a result of enactment of the Resource Management (Simplifying and Streamlining) Amendment Act 2009. The changes apply to several Activity Areas in the District Plan and affect the nikau palm tree protection rules and the vegetation clearance rules from the District Plan[25]. Council is now required to replace blanket tree protection rules with lists of "significant trees" which have been assessed and the locations plotted.

Changes to the Chapter 14G of the District Plan – City of Lower Hutt will require a plan change and this will involve an extensive public consultation process. Changes to the RMA are a motivation for Council to consider the list of Notable Trees in the District Plan. It may be possible for Council to identify additional specimen trees and areas of bush and protect them within the District Plan.

The Urban Forest Plan advocates for the protection of additional trees within the District Plan. The Urban Forest Plan could provide some guidance for developing assessment criteria related to notable trees. The Urban Forest Plan, being the lower level document, may be able to feed into the District Plan. In addition to the notable tree protection criteria outlined by the New Zealand Institute of Horticulture (NZIS), new criteria could be considered. For example:

- Is the vegetation an important source of seed for propagation?
- Does the presence of the tree contribute to the neighbourhood or land/streetscape in a way that cannot practically be simulated by street trees?
- Does the tree make an outstanding visible contribution to the city or is it out of the general public's view?
- Does the tree perform a street tree like function, effectively enhancing the streetscape?
- Is there a reasonably high level of risk that the tree will suffer pest or disease attack which will significantly affect its life expectancy or quality?
- Is the vegetation a pest plant or is it likely to be considered as one in the future?

At this time the New Zealand Standard Tree Evaluation Method (STEM) is considered to be more useful than the NZIH method used in the District Plan. The District Plan should nominate STEM as the preferred tree assessment method as part of any future plan change proposal.

In order to prepare for any proposed plan change to Chapter 14G, officers in the Environmental Policy Division and Parks and Gardens Divisions should take advice from a qualified and experienced arborist. This advice would be required to:

a) set up and trial the STEM method, including the additional 5 criteria set out in the bullet points above; and

b) investigate District Plan opportunities to identify potential specimens for protection.

[25] In 2011 Council resolved to adopt a new method of protecting nikau palms and it targets individual trees on the valley floor for protection.

# Professional Participation

"When it comes to trees, everyone thinks they're a *@^&#%^ expert!" (local arborist, pers. comm.)

Engineers plan and supervise road works. There are choices about the way road works are done but local residents don't expect to participate in decisions about ordinary maintenance and renewal of local utility assets like pipes and roads. Somehow residents see management of the urban tree assets differently. In some sites there are opportunities where residents can make meaningful contributions to tree matters. At other sites community participation is time consuming and makes little (or even poor) long term contribution to the quality of the city's trees. It requires reporting back and often is the cause of deferring decisions about long term management of trees.

Tree management is a specialised field. Qualified arborists are a standard feature of most large local authorities. Prior to local government amalgamation and prior to contracting out parks operations, Lower Hutt City Council employed an arborist.

As the tenth largest local authority[26] in New Zealand, Hutt City Council's heavy reliance on contractors for arboricultural advice is unusual. Occasional tree reports are sought from qualified arborists working as consultants. Ongoing maintenance work is contracted out to Downer New Zealand Limited, who employ a number of arborists in operational roles. Downer staff are often the face of Council's tree planting and maintenance activities. Most of their contract work is directed at street trees. Downer staff are capable and responsive.

Our urban forest needs a plan, particularly the street trees. Without a plan and a clear idea of what the street tree asset is supposed to provide, tree decisions are more difficult and less consistent. Since the late 1980s part of Council's tree management role has been involving local residents with the decision making process for many local tree issues. This has involved individual specimen trees, whole treed streets or sections of treed streets and stands of trees in natural areas. In the experience of current and previous officers, this results in decisions being made on the basis of emotion, rather than practicality or long term benefit or cost to Council. It constrains the sensible and timely management of the street tree asset. Dealing with individual trees is not providing satisfactory results. A whole street approach will be more effective and it will prove more options for residents and Council.

If the themes in this plan are adopted there will more commitment to planning, managing, planting and removing street trees in order to achieve a city that is well treed with good quality trees in sensible locations. A new, more strategic, management approach will be required and this is likely to provide less opportunity for resident participation in decision making on straight forward tree matters.

Officers believe a new approach is justified in order to achieve a better tree asset in the long term. However, this won't alter the strong emotional connections residents have with trees in their neighbourhood. Making decisions more independently and advising residents of these decisions will be a challenge for Council. It already is but it may get worse, particularly over the next few years, if the proposed programme is implemented.

[26] statement made prior to launch of Auckland Council on 1 November 2010

Officers believe that approximately 6,000 street trees need to be removed by 2030 in order to achieve the street trees set out in this Urban Forest Plan. This will be offset by approximately 6,000 new trees.

Implementing this plan will require greater resource than Council currently employs. Council currently dedicates .6 of a full time employee (approximately) to carry out asset management functions associated with trees (predominantly street trees). This equates to .61% of the full time equivalent staff in the Parks and Gardens Division and the overheads associated with this work are approximately $84,000 annually[27]. It is anticipated that a full time equivalent staffing unit would be required to undertake a variety of tasks identified in this Plan, including:

- Emphasising a professional, whole of street, asset management approach
- develop themes for wards and street tree master plans incorporating, as necessary, a variety of disciplines and including professional design and arboricultural input and advice from infrastructural engineers and residents
- communicate the visions in this plan to elected members, including Community Committees and Community Boards, residents associations and other organisations
- implement street tree master plans
- increase the number of annual plantings from 60 to 350 trees with attention to detail
- develop a relationship with the providers of overhead and underground services
- work with the Road and Traffic Division to establish berm standards and to contribute to Council projects which involve trees
- arrange for trees to be contract grown and trial new species
- promote the benefits of trees in the urban area and encourage and advise other key property owners interested in trees
- distinguish tree matters that require consultation from those that require notification and coordinate accordingly
- respond to requests for service about street trees and trees in urban parks in accordance with the themes set in this plan
- review this plan in 5 years with the aim of refining the document to reflect the practical situation
- alongside other Council officers, work with the Street Tree Maintenance contractor (currently Downer New Zealand Ltd) to fulfil contract requirements and further develop the partnership philosophy adopted by Council and the contractor

[27] Overheads include a portion (6.1%) of the Parks and Gardens Divisional Operating and Employees costs (the administration costs for the Division) plus Parks and Gardens Support Costs (excluding Finance Costs and Depreciation)

# Bibliography


Bradshaw, A., Hunt, B. and Walmsley, T. (1995) *Trees in the Urban Landscape, Principles and Practice.* London: E and FN Spon.

Brockie, Bob. (1997) *City Nature, a guide to the plants and animals of New Zealand's cities and towns.* Auckland: Penguin Books (NZ) Ltd.

Brookes, John. (1969) *Room Outside: a plan for the garden.* London: Thames and Hudson.

Capon, Brian. (2001) *Botany for Gardeners.* Hawthorne, Australia: Bloomings Books.

Chivian, Eric and Bernstein, Aaron. (2009) *Sustaining Life, how human health depends on biodiversity*. New York City: Oxford University Press, Inc. Chapter 3

Church, Glyn. (2002) *Trees and Shrubs for Foliage.* Auckland: David Bateman Limited.

Cobb, John with Trustees of the New Zealand Native Forests Restoration Trust. (1992)

*The Living Forests of New Zealand.* Auckland: David Bateman Ltd, in association with New Zealand Native Forest Restoration Trust.

Crowe, Sylvia. (1981) *Garden Design, second edition.* Chichester, England: Packard Publishing Limited. pages 90 to 113

Dawson, John. (1988) *Forest Vines to Snow Tussocks, the story of New Zealand plants*. Wellington: Victoria University Press.

Dawson, John and Lucas, Rob. (1993) *Lifestyles of New Zealand Forest Plants*. Wellington: Victoria University Press.

Dawson, John and Lucas, Rob. (2004) *Nature Guide to the New Zealand Forest*. Auckland: Random House New Zealand

Ellsworth, John C. (2009) Wildfire in Yellowstone Then and Now. *Landscape Architecture April 2009:* 74-79

Erickson, Donna. (2006) *MetroGreen: Connecting Open Space in North American Cities.* Washington, DC, United States of America: Island Press.

Fleet, Harriet. (1984) *New Zealand's Forests*. Auckland: Heinemann Publishers.

Fleet, Harriet. (1986) *The Concise Natural History of New Zealand*. Auckland: Heinemann Publishers.

Foster, Tony. (2008) Plant Heritage New Zealand, Te Whakapapa o nga Rakau Interpreting the Special features of Native Plants. Rosedale. Penguin Group (NZ)

Gabites, Isobel. (1993) *Wellington's Living Cloak. A guide to the natural plant communities*. Wellington: Victoria University Press.

Given, David. (2004) *Going Native – making use of New Zealand plants*. Christchurch: Canterbury University Press. Chapters 14 and 15

Hall, L. (1940) *Lower Hutt Past and Present.* Lower Hutt

Hellmund, Paul Cawood, and Smith, Daniel Somers. (2006). *Designing Greenways: Sustainable Landscapes for Nature and People.* Washington, DC, United States of America: Island Press.

Kenneally, JM and BM. (1983) *Past Days in Lower Hutt and Petone.* Wellington: Colonial Associates

Kuo, Frances E., 2010 Research Series for National Parks and Recreation Association, Parks and Other Green Environments: Essential Components of a Healthy Human Habitat

Landcare Research, 2008, How to put nature into our neighbourhoods : application of Low Impact Urban Design and Development (LIUDD) principles, with a biodiversity focus, for New Zealand developers and homeowners / Maria Ignatieva … [et al.]. -- Lincoln, N.Z. : Manaaki Whenua Press, 2008. (Landcare Research Science series, ISSN (print) 1172-269X ; no. 35)

McGill, David. (1991) *Lower Hutt, the first garden city*. Publisher unknown

McPherson, Greg. A comparison of municipal forest benefits and costs in Modesto and Santa Monica, California, USA. *Urban Forestry and Urban Greening Vol 1, Issue 2, 2002, pages 61-74.*

McPherson, Greg. (2007). Urban Tree Planting and Greehouse Gas Reductions. Retrieved 30 August 2009 from http;//www.docstoc.com/docs/33577924/Urban-Tree-Planting-and-Greehouse-Gas-Reductions

Milner J. Edward. (1992) *The Tree Book – The indispensible guide to tree facts, crafts and lore.* London: Collins and Brown Limited, pages 149 to 176

Ministry for Environment, Retrieved 25 June, 2009, from http://www.mfe.govt.nz/issues/climate/lucas/

Ministry of Works and Development. (1983) Guidelines for Street Planting in Eastbourne. Wellington. Document produced for Eastbourne Borough Council

Mitchell, Alan and Coombes, Allen. (1999). *The Garden Tree: An illustrated guide to choosing, planting and caring for 500 garden trees.* London: Seven Dials, Cassell and Co. Pages 7 to 20

Meurk, Colin D. and Hall, M.J. Options for enhancing forest biodiversity across New Zealand's managed landscapes based on ecosystem modelling and spatial design. *New Zealand Journal of Ecology (2006) 30(1): 131-146.*

Meurk, Colin, Retrieved 9 January 2012, from http://www.listener.co.nz/commentary/nature-ground-zero/

Office of Auditor General, Retrieved 1 May, 2009, from http://www.oag.nz/local-govt/ltccp/part6.htm

Park, Geoff. (1995) *Nga Uruora, Ecology and history in a New Zealand Landscape.* Wellington: Victoria University Press.

Park, Geoff. (2006) *Theatre Country, Essays on landscape and Whenua*. Wellington: Victoria University Press.

Petherick, Tom. (2006) Trees That Shape the World. London: Quadrille Publishing Ltd.

Salafsky, N and Margoluis, R. Threat Reduction Assessment: a Practical and Cost-Effective Approach to Evaluating Conservation and Development Projects. *Conservation Biology Volume 13, No 4, August 1999*: 839-841.

Small, R (2001) untitled article. *New Zealand Leisure Manger, Winter 2001:* 5
Treadwell, N. (2000) Providing the Best . *Landscape New Zealand, January 2000:* 38-39-39.

Spellerberg, Ian F, and Given, David. (2004) *Going Native: Making use of New Zealand's plants.* Christchurch: Canterbury University Press.

Taylor, JO. (1976) *Tree Maintenance*. Canterbury, New Zealand: Lincoln College Press. Page 86

Wearing, S, Goodall, H., Byrne, D. and Kijas, J. (2008) Cultural Diversity in the social value of parkland: Networking Communities and Park Management. *Australian Parks and Leisure Volume 11, No. 2, Winter 2008:* 20-29

Wolf, K. (2007) City Trees and Property Values. *Arborist News, August 2007*

World Forestry Center in Portland, Oregon and Robin Morgan, Urban Forestry Consultant, (1993) *A Technical Guide to Urban and Community Forestry.* Publisher unknown

Lower Hutt Past and Present (author unidentified), (1941), Lower Hutt: Lower Hutt Borough Council.

**The Urban Forest Plan has been stored electronically**

**DOC/10/28169 within DIV/10/722 in PKR65-70-105 of Hutt City Council TRIM electronic record system**