Southgate, Paula (2007)

Cities and Biodiversity

Cities and biodiversity

Including case study:

Hamilton Halo project: Bringing back the Tui to Hamilton.

Kelloggs' Rural Leadership Programme 2007.

Project report

Councillor Paula Southgate.

Acknowledgements:

Thank you to the Hamilton Halo project team at Environment Waikato in particular Ben Paris (project leader) and Kevin Collins. It is a pleasure to work with you on this worthy project.

Thank you to the staff at Environment Waikato for helping me swim in a sea of vital information, constructive advice and making this project look great!

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Project description

The project has three related parts:

1. **A global perspective**: an overview, based on current global literature, of the importance of cities and the land around them in preserving and enhancing biodiversity worldwide.
2. **The New Zealand situation**: an investigation of some of the current thinking, research and practice to enhance biodiversity in urban areas around New Zealand and, the importance of rural areas around cities. The focus will be on the Waikato situation and includes a local case study.
   Local case study – Hamilton Halo project: a description of the development and launch of a significant project to increase the numbers of tui returning to Hamilton city. The Hamilton Halo project is a biosecurity and biodiversity action aimed at biodiversity outcomes in Hamilton city.
3. **Going forward**: suggestions (based on global experience and the New Zealand situation) for government and local communities to move closer towards meeting biodiversity goals in and around cities.

"The cities will determine the fate of the remaining biodiversity of our planet. The battle for life will be won or lost there".

Ahmed Djoghlaf – executive secretary of the UN convention on Biological Diversity.

Foreword

People living in urban areas, especially medium to large sized cities, such as Hamilton, have less opportunity to connect with 'the natural world' than people living in the rural areas. Although urban people leave the city from time to time to enjoy the 'great outdoors' around the wider region, biodiversity tends to have a low profile in urban areas. While urban people appreciate the 'beauty' of places and how it feels to be there, the value of natural ecosystems outside the city boundaries is not well understood.

The participants and guest speakers of the 2007 Kelloggs' Rural Leadership Programme highlighted a growing disconnection of urban people with issues happening in the rural areas. This included the understanding of the interconnectedness and importance of rural areas for the sustainability and long term well being of urban areas.

As a 2007 Kelloggs' scholar and an urban person who works with rural and environmental issues I recognized an opportunity to promote better understanding of peri-urban areas and rural fringes around the city and their importance to cities. However, in this study I wanted to retain a focus on urban biodiversity and getting urban people to better understand the values of the natural environment.

I began the project by reading about green spaces around cities and ways to create better urban biodiversity. The inter-connection of the two was evident. The global literature painted a bleak picture for biodiversity without the engagement and action of people living in cities.

I began to discuss these ideas at Environment Waikato and explore possibilities to support a biodiversity project with tangible outcomes for Hamilton city. I decided to add political support in developing a proposed biosecurity/biodiversity project to increase the survival of tui and consequently the numbers of tui visiting Hamilton city.

Early planning meetings for the 'Halo project' had indicated the need for 'political leadership' at a city level. I was excited by the project concept and decided to take up this role.

The Halo project is a wonderful opportunity for Hamilton city and the areas surrounding it. It will help build a foundation for improved urban biodiversity over time and strengthen biodiversity fragments, stepping stones and corridors within a 20 minute drive of the city. It also enables urban people to understand and appreciate the importance of protecting and enhancing land in the peri-urban areas and rural fringes.

There are some significant challenges ahead. Predominantly these relate to securing on going funding, creating better integration between complimentary biodiversity actions and, increasing and supporting community awareness and participation. City dwellers will have a pivotal role in turning the tide on the decreasing biodiversity within and near cities.

In this project I aim to highlight the obstacles and opportunities. My challenge as a Kelloggs' scholar is to provide information to assist community leaders to improve the understanding of, engagement and participation of urban people in improving New Zealand's biodiversity outcomes.

Councillor Paula Southgate

The case for biodiversity

Introduction

In the past decade the decline of biodiversity[1] on a global scale has forced nations to seriously re-focus discussion and planning around the protection and enhancement of the natural environment for the benefit of all living things on the planet. The quest to preserve the planet's biodiversity goes beyond saving rare animals and plants. It is at the heart of preserving the life giving resources vital to preserve human wellbeing into the future.

The solution is complex, urgent and requires the participation of all levels of society from governments to community volunteers. It requires deeper levels of understanding, sound policy drivers and on the ground activity by both people living in rural and urban areas.

People living in urban areas, especially medium to large sized cities, have less opportunity to connect with 'the natural world' than people living in the rural areas. Parks and green spaces can offer a sense of nature but city people are accustomed to aspects of the built environment (positive and negative) and the natural places around the city or in the wider environment are considered as completely separate entities. Urban people rarely fully understand the impact of cities on biodiversity nor the important role cities have in reversing the decline of biodiversity.

Fact!

200 years ago London was the only city with more than one million people living in it. Today across the globe there are more than 400 cities of at least that size.

Fact!

These cities only occupy 2% but are responsible for at least 75% of the resources consumed by the global population, including fossil fuels.

In-fill, high density housing replaces traditional homes with large gardens (Hamilton – Frankton).

[1] Biodiversity – short for "biological diversity", refers to the full diverse range of plants and animals and the places they live.

Biodiversity: a global issue

In 2002 at the World Summit on Sustainable Development in Johannesburg world leaders endorsed a target of achieving a significant reduction in the rate of biodiversity loss at the global, regional and national level by 2010.

In 2002 the UN Millennium Ecosystem Assessment report warned that over the last 50 years humans have been destroying the earth's resources at a faster rate than ever before. This report was called for by United Nations Secretary-General, Kofi Annan, to assess the effects of changes to the world's ecosystems.[2] The aim was to provide robust science to lead planning and action for the sustainable use of natural resources. The report opens with a 'stark warning' about the unsustainable nature of human activity.

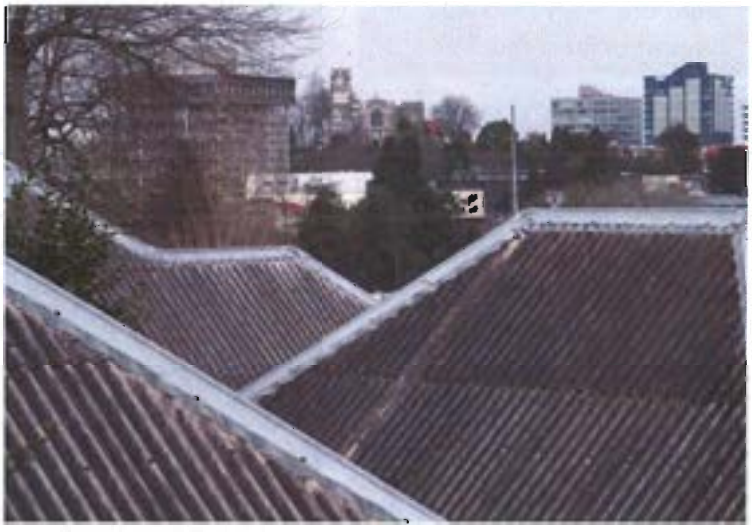
"The provision of food, fresh water, energy and materials to a growing population has come at considerable cost to the complex system of plants, animals and biological processes that make the planet habitable".[3]

Scientists agree that the planet's biodiversity loss demands urgent action, otherwise by the middle of this century about one fifth of the world's plant species may be doomed to disappear. Biodiversity is recognized by scientists, planners and growing numbers of politicians as vital for supporting ecosystem services[4] for life on earth. The planet's natural resources provide foods, medicines, resources for industry and protection for the world's climate and biosphere.

The conservation of and sustainable use of biodiversity can, however, strengthen ecosystem resilience and improve the ability of ecosystems to provide critical services in the face of increasing climatic pressures. Biodiversity is important to maintain ecosystem viability in the long term.[5]

"As biodiversity is degraded human society becomes more vulnerable because options for change are diminished. Biodiversity can be seen therefore as 'life insurance policy for life itself".

UNEP and UN-HABITAT – Ecosystem and Biodiversity: The Role of Cities Sept 2005.



Trees among roof's: Cities need to provide space for nature. (Hamilton – from Environment Waikato).

[2] Ecosystem – communities of living things (plants, animals, insects) that interact together as an ecological unit.

[3] Millennium Ecosystem Assessment 2002 – United Nations.

[4] Ecosystem services – the services such as food, fuel, timber provided by natural ecosystem resources such as plant material, minerals or water.

[5] UNED/CED/Cities/1/2/Rev.1.

Cities and biodiversity – the implications

Sustainable urbanization emerged as a key issue at the World Earth Summit in Rio de Janiro, due to the disturbingly clear evidence of the negative impacts of urban growth on the social and environmental wellbeing of both cities and the lands that surround them.

The current situation

Studies of the 'ecological footprint'[6] of cities show that cities affect a geographic area vastly greater than their own surface area. This ecological footprint has a direct impact on biodiversity loss which is often not well understood.

> "A city's ecological footprint contributes significantly to biodiversity loss, both locally and at a global level."
>
> *UNEP and UN-HABITAT – Ecosystem and Biodiversity: The Role of Cities Sept 2005.*

Protecting biodiversity values in urban areas and the land around them is a challenge due to the increased pressures of human presence and activity. Threats to biodiversity include: the removal, reduction and fragmentation of green or natural spaces for habitat; environmental pests such as weeds, feral cats, rats and ferrets; increased pressure from recreational activity and urban infrastructure projects including roads.[7]

Cities provide some benefits to those who live there over those in rural areas. These benefits arise from concentrated populations and local production levels. These include services such as transport and sewerage, water reticulation and access to social services and choices of housing.

Cities also benefit from increased rural demand for urban goods and services and added value derived from agricultural product. Cities help increase productiveness and competitiveness and, can allow for thriving trading centres outside the city boundaries. One example might be 'sleepy little fishing villages' becoming commercial hubs for fresh produce.

"Cities are also engines of rural development. They provide many opportunities for investment which not only support urban development but also contribute to rural development and strong urban-rural linkages".[8]

The importance of green space within and around cities as a significant 'living land asset' is well accepted globally. We rely on it and the natural processes associated with it for resources such as timber, water, food, fibre and employment. It is also a *'major source of photosynthetic regeneration'* and can be the 'lungs of the city'. It allows for the conservation of biodiversity, purifies pollutants and sustains the ecological environment of both the city and surrounds. In peri-urban[9] areas of cities the benefits of agriculture and horticulture are now also being recognised as sources of amenity and open space that can also contribute to wealth and conservation.[10]

6 Ecological Footprint – area of land needed to produce populations or individual person's resources (food, shelter, water etc) and absorb their wastes.

7 www.dse.vic.gov.au (updated on 11/12/2006).

8 State of the worlds cities 2006/7 – The Millennium Development, Goals and Urban Sustainability, 30 years of shaping the Habitat agenda.

9 Peri-Urban – land areas at the rural/urban interface usually on the fringe of urban or rural residential areas.

10 Benefits of green space: Greening our cities and surrounds – David Adlous (Australian Parks and Leisure – Summer 2006.

Green infrastructure[11] helps to maintain natural ecosystems, including clean air and water, reduces wildlife habitat fragmentation, pollution and other threats to biodiversity. However, urbanization can also bring about irreversible changes in consumption of water, energy and land. Urban sprawl can have direct consequences for the surrounding rural area. Cities rely on surrounding ecosystems for goods and services whilst growing at the expense of nearby agricultural lands. This can lead to the degradation of wetlands, forests and other habitats and ultimately a loss of biological diversity.

"Subdivision of agricultural land, particularly in peri-urban areas, has become a contentious issue in all Australian states with Queensland, Victoria and South Australia recently introducing legislation to protect prime land".

"In managed landscapes, the increasing expansion of urban centres, the growing development of agriculture and the continued harvesting of forests all contribute to changes in landscapes values. This affects biodiversity and natural habitat in complex ways. Species that rely on certain amounts of space or food sources may not be able to tolerate rates or types of change". [12]

Interestingly, despite increasing pressures, land in the urban areas and on the fringe of urban development can have similar biodiversity and conservation values to rural landscapes. Also small remnants of green space and natural habitat in cities can be highly valued by the local community. They are important in providing urban dwellers with a direct link to the natural heritage of an area and can assist to develop a 'sense of place' in urban environments.

"Several biodiversity challenges that are specific to cities (and, to a large extent, land within their jurisdiction) such as the provision of green spaces and urban protected areas, appropriate urban infrastructure, sustainable transportation, better air quality, adequate waste management and minimized industrial pollution are becoming the most urgent issues on a local, national regional and international scale."[13]

"Disproportionate growth of the world's urban population could result in further loss of many forms of life on Earth, warn experts in the sciences of climate and biodiversity."

www.citymayors.com/environment/biodiversity.html.

[11] Green Infrastructure – ecologically considerate infrastructure such as permeable paving, rain gardens, solar heating.

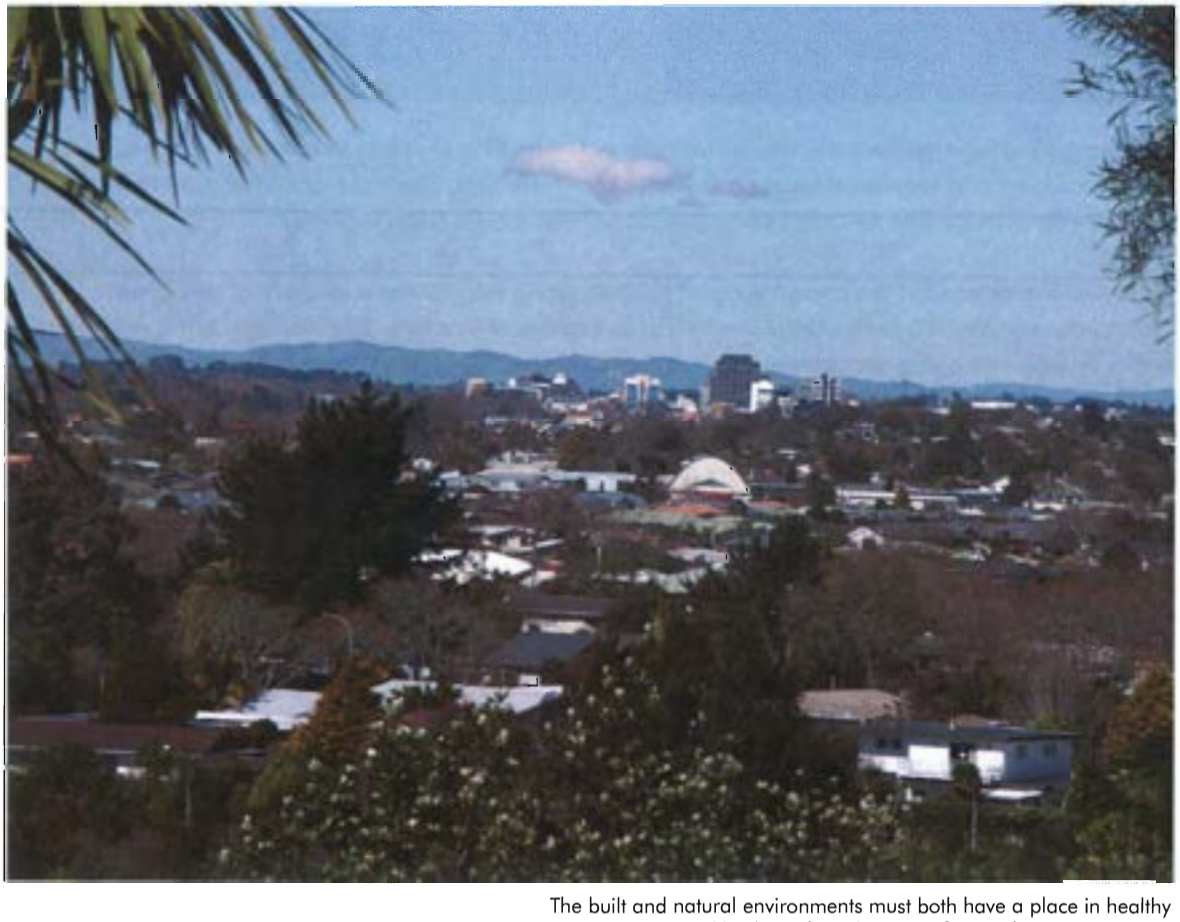
[12] www.dse.vic.gov.au (updated on 11/12/2006).

[13] UNED/CED/Cities/1/2/Rev.1.

International studies indicate that there is a serious failure to incorporate environmental concerns into planning and on the ground action in our communities. Aside from irreversible impacts on the natural resources this can result in over urbanization, poor air and water quality, resource restrictions for industries and even the development of slums.

Further growth in urban populations, which is fully expected, may also have serious implications for climate change but will also result in further loss of many forms of life on earth. For these reasons those living in cities need to incorporate the protection of biodiversity all aspects of the modern urban lifestyle.

Many cities have begun to do just that and increasingly better quality information is emerging on the tools and actions required to stem the tide of destruction of the very resources we need for our future survival.



The built and natural environments must both have a place in healthy cities (Hamilton city – view from Pukete water tower).

The way forward

The first step for cities is to recognize their role in biodiversity protection and to commit real resources and efforts to the problem.

Cities have to consider the impacts of their activities beyond their territory, on the surrounding natural and agricultural ecosystems. Sound urban planning helps to maintain natural ecosystems, including clean air and water; reduces wildlife habitat fragmentation, pollution and other threats to biodiversity.[14]

Curitaba, in Brazil, is one example of a city with proactive urban planning towards a 'green city'. This includes a network of parks, green spaces and forests.

Brazilian architect Jaimie Lerner believes that:

"Urbanization and ecology can co-exist but demands increasingly active participation from all the stakeholders, including public and private sectors and the public."

Fact!

In 2002 at the World Summit on Sustainable Development in Johannesburg, world leaders endorsed the target of achieving a significant reduction in the rate of biodiversity loss by 2010.

However, international literature suggests that policy makers at the local and national level are failing to devise and execute environmentally sound policies because they are not closely in touch with the scientific community.

"Good design of subdivision and development in peri-urban areas which is sensitive to the natural values and attributes can make a considerable difference".

Managing Change in Paradise: Sustainable Development in Peri-Urban Areas; Parliamentary Commissioner for the Environment, New Zealand (June 2001)

"Understanding how to accommodate sustainably both people and nature in cities is a challenge for urban ecologists and requires a focus on key scientific challenges. There are also important linkages within the rural fringe (the so-called peri-urban zone) that require fuller evaluation."

Urban ecologists support the preservation of habitats along with 'green engineering' and green infrastructure so that the built habitat maximizes its ecological function. This includes, but is not limited to, the incorporation of green spaces, roof gardens, roosting boxes and permeable paving and well vegetated urban run-off zones.[15]

In addition to scientists, land-use planners and policy makers have a critical role to play in promoting sustainable biodiversity and its biodiversity components. Also it is important to have the engagement and buy in of other stakeholders including developers and managers of local infrastructure, local authorities and the general public. This will include sound and innovative development both in and around cities that is sensitive to and values the local natural values.

Review of international planning and management approaches suggests that the essential elements of a new response to biodiversity protection include: leadership, integrated planning, community partnership, research, resource inventories and prioritization backed up with action on the ground.

[14] UNED/CED/Cities/1/2/Rev.1.

[15] J. Sadler, University of Birmingham 2006 www.edinburgh.ceh.ac.uk.

The State government of Victoria, Australia has set up significant management protocols which focus on biodiversity. These include:

1. to assist local government, developers, communities and urban infrastructure developers to protect and manage sites of significance;
2. to promote and facilitate urban community involvement in the stewardship of biodiversity values;
3. to focus resources on the more ecologically viable remnants.[16]

The American Planning Association[17] states that it is necessary to achieve sound partnerships across all sectors of the community. An integrated, city and regional-wide approach to the planning and management of vegetation in and around the cities is considered essential to secure environmental, economic and social benefits for people living in cities.

"Leaders of society and management need to demonstrate financial security, remove any negative environmental impacts and conform to the communities expectations. All disciplines must work together."

There is a need to "Encourage public, private and non-profit cooperation to achieve a new level of partnership to preserve and enhance ecological integrity over the short and long term - important for the sense of stewardship and expanded understanding of the long-term implications of daily decisions and the benefits of conservation".

This would include: water and land conservation, including farmland preservation, soil and wetlands conservation and brownfield remediation and re-development. All development – including re-development, infill development and new construction in urbanizing areas – should plan for biodiversity and incorporate green infrastructure. All levels of government should work with non-profit organizations, businesses and citizens to designate green infrastructure policies and carry them out. An inventory of natural processes and ecosystems is viewed as an essential part of the pre-planning.

It would also be important to prioritize places for protection and enhancement where intensive pest control could allow for biodiversity to flourish. Sound urban planning could include; planting native forest 'stepping stones' or continuous streamside, road or rail side vegetation to allow animals to move between larger forest patches. It may also involve slowing in the conversion rate of agricultural and non-urbanized land to urban-type land uses and the protection of wetlands.

Urban streams/stormwater management can enhance the natural habitat in residential areas (North Hamilton).

[16] www.dse.vic.gov.au (updated on 11/12/2006).

[17] American Planning Association –www.planning.org.

Wetlands have an important role to play in water catchments (storage/flood protection), water filtration and biodiversity.

In the United Kingdom the Biodiversity Action Plan was published in 1994. It provided a new framework for conservation in the UK in response to the need to implement the local biodiversity component of agenda 21 arising from the 1992 Earth Summit (United Nations, Rio de Janiro).

In 1998 Devon County Council (UK) published a Biodiversity Plan. The priorities are:

1. To targets **priorities** which are identified in Biodiversity Action Plans
2. To focus on **enhancement** – rather than seeking to conserve only as much as possible of our present day wildlife – to replace past losses
3. To foster **partnership in action** – 'common agenda across a broad range of partners.'
4. To develop **political weight** – must have national, regional and local political backing.

The council also recognised an important strategic function in planning for economic, social and environmental wellbeing which 'must be translated into policies which promote the conservation of the natural environment'. The council also recognised the role of regulating the use of natural resources.[18]

Similarly the Dutch Ministry of Agriculture developed a "Local Action on Biodiversity" Plan which proposes:

1. A public declaration by the **city leadership.**
2. A report on **current state of resource** and its management within the area.
3. To develop a 10 year Biodiversity **Action Plan** and Framework (including commitments to annual implementation plans).
4. To gain **formal acceptance** of the plan and **communication** of the relevance of biodiversity for the regions development.
5. The **implementation** of five on the ground interventions by 2010.[19]

"Cities offer special opportunities for biodiversity protection. For the most part the lack of grazing animals and other threats can be useful in establishing threatened plants that are struggling in their natural habitats. Large populations provide opportunities for wide spread education about the environment and access to a good volunteer base. However, progress will require the strengthening of cooperation and partnerships between municipal and regional authorities. Integration between planning and actions across boundaries (in urban and peri-urban areas) is vital".[20]

"While biodiversity loss and damage to ecosystems are global issues, in practice it is local and national actions which have the potential to address the situation".

Ecosystems and Biodiversity, the role of Cities UNEP, UN Habitat (Sept 2005).

[19] ICLEI – www.countdown2010.net.

[20] Urban biodiversity patterns in New Zealand – B.D Clarkson, P.M Wehi, L.K Brabyn (2007).

Summary of suggested actions

It is clear that cities must respond quickly and effectively if they are to meet the goals of the Convention on Biological Diversity and take up their key role in efforts to preserve life on Earth. This will require linkages between all levels on government. Biodiversity issues must be included at a planning, action plan and formal work programme level. The predominant approaches can be summarised as:

- City, regional and national **political leadership**.
- Understanding and **involvement of stakeholders** at all levels.
- Wide ranging **partnerships** between stakeholders.
- The development of **policies** for conservation of natural resources.
- **Regulation** to protect natural resources.
- Strong ties with the **scientific community**.
- Identifying **priority sites** for protection or enhancement inside and around cities.
- Commitment and **action** – doing work to both conserve and enhance biodiversity.

Roading corridors are built over the natural environment but can provide excellent wildlife corridors if well planned and planted (Eastern Arterial Hamilton).

Biodiversity in New Zealand

Introduction

New Zealand is widely considered a beautiful country by both its residents and visitors. It has a diverse, broad array of attractive ecosystems from long white sandy beaches to snowy peaked mountains. With a low population, largely concentrated in the cities, and dominated by agriculture there is plenty of the 'great outdoors' to be enjoyed. Historically, New Zealand has also been able to capitalize on a perceived 'clean, green' image.

However, the threats to New Zealand's biodiversity are very real and concerning. New Zealand's isolation from other land masses has provided for unique and rare ecosystems that are now very vulnerable. The threats include the increase in the types and extent of pest incursions, intensified agriculture and land losses due to increased development especially, in urban and peri-urban areas.

Kahikatea stand in inner city bush remnant (Hamilton).

The path to biodiversity protection in New Zealand

> "More than one thousand of our known animal, plant and fungi species are at risk of extinction. If future trends continue, many populations of the kiwi, a symbol of our national identity, will also be effectively extinct within 20 years".
>
> *Our Environment – Newsletter of Christchurch City Council 2000.*

New Zealand attended the Rio Earth Summit in 1992. The decision to sign the Convention on Biological Diversity was ratified by the government in 1993. New Zealand had already begun efforts to respond to biodiversity loss. However, the State of the Environment Report (1997) described biodiversity decline as New Zealand's most 'pervasive environmental issue.' The report stated that:

"Nearly 1,000 animals, plants and fungi have been identified as threatened. One of the worst affected groups is our endemic land and freshwater birds, three quarters of which are now threatened".[21]

One thing that made New Zealanders begin to take notice was the fear that even the national icon bird, the kiwi, was under threat and as a worst case scenario could be lost for ever in less than 25 years.[22]

Over time, as human population increased in New Zealand so did the pressures on the environment. These pressures or threats were related to man's use of natural resources (human predation) and habitat[23] destruction. Threats included (and still do) increasing plant and animal pests, land use for settlements, roads and agriculture and also the effect of recreational activity. The cumulative effect of

[21] State of the Environment Report 1997 – Ministry for the Environment.

[22] Our Environment – Newsletter of Christchurch City Council. Issue 23, winter 2000.

[23] Habitat – the places where animals, insects, people and other organisms live.

all of these activities has been an important factor. By the late 90's the effect of all the 'little' losses over time was really becoming noticeable.

While New Zealand's unique environment and geographic isolation have a bearing on biodiversity, the threats outlined above closely resemble those experienced on a global scale. The most important of these causes in New Zealand have been identified as:

- habitat destruction/modification, through the removal, fragmentation and degradation of ecosystems,
- the effect of introduced pests and weeds on New Zealand's indigenous biodiversity.[24]

The New Zealand Biodiversity Strategy was launched in 2000 and backed with government funding of $187m across 20 programmes over 5 years. The aim of the strategy was to guide the work of government agencies, local government and community groups in halting the decline of New Zealand's biodiversity.

In December 2000 the report entitled *Bio-what?* was published. This proposed a number of actions to overcome some of the obstacles New Zealand faced in meeting it's commitment to the International convention on Biological Diversity. *Bio-what?* identified the need for a national information system, clearer allocation of local authority roles and responsibilities and changes to legislation.

Fact!

Forests covered 85% of NZ before humans arrived. Today the figure is 25%.

The programmes initially funded relate to; land based programmes, land based biosecurity and marine programmes. Methods selected include providing advice and information, research and monitoring and some on the ground conservation and pest control work.

In 2001 concern about the impacts of human settlement on 'desirable landscapes' led to a report entitled *Managing Change in Paradise: sustainable development in peri-urban areas*. A series of New Zealand case studies was used to highlight pressures in the peri-urban areas. The report raised questions which could guide improved environmental planning and management. It did not propose solutions.

In 2003 the Resource Management Act 2001 was amended to better protect biodiversity functions. It defined biological diversity in a way that was consistent with the International Convention on Biological Diversity. It also gave regional and territorial councils greater functions to maintain and enhance biological diversity. Regional councils were to *"establish, implement and review objective policies and methods for indigenous biodiversity"*. Territorial councils were required to *"control the effects of the use of land on the maintenance of indigenous biodiversity"*.[25]

Fact!

Overall, there are 700 acutely and chronically threatened species. New Zealand is undertaking recovery programmes with only 12% of these.

In 2003 the parliamentary commission for the Environment published *Superb or Suburb? International case studies in management of icon landscapes,* which considered a number of international and New Zealand based planning approaches for managing the pressures on our natural and iconic

[24] Final Report of the Ministerial Advisory Committee on Biodiversity and Private Land 2007 (Appendix 3).

[25] Enfocus: Biodiversity and the LTCCP – www.qp.planning.org.

landscapes from development. A little after this a Ministerial Advisory Committee for Biodiversity was put together to assess the effects of private land management on biodiversity and, to guide and reinforce actions promoted by the Biodiversity Strategy.

Recently, in 2007, the Minister for the Environment published some national priorities for protecting biodiversity on private land. The report *Protecting our Places*, identified the limitations of relying on public estate and conservation land for biodiversity restoration.

It focused attention on the role of private landowners. The minister noted:

"Some of our most threatened ecosystems and species are now found only on private land; their long term survival will depend largely on the stewardship (kaitiakitanga) of landowners" .[26]

Timeline of some key influences on New Zealand's approach to biodiversity.

1991	Introduction of the Resource Management Act.
1992	World Earth Summit - Rio de Janiro - International Convention on Biodiversity signed.
1993	Signing of Convention on Biological Diversity ratified.
1997	State of Environment Report – Biodiversity decline stated as NZ's most pervasive environmental issue.
2000	New Zealand Biodiversity Strategy launched by Government.
2000	December – 'Bio-What?' a report on New Zealand's progress in meeting commitment to convention.
2001	'Managing Change in Paradise' report by the Parliamentary Commissioner for the Environment on sustainable development in peri-urban areas.
2001	Biodiversity Advisory Service established – along with contestable biodiversity funding scheme.
2003	Amendment to the Resource Management Act giving greater responsibilities to Regional Councils and Territorial Authorities to maintain and enhance biodiversity.
2006	Ministerial Advisory Committee on Biodiversity and Private Land – Report.
2007	National priorities for protecting biodiversity on private land published by Minister of Environment.

[26] Protecting Our Places: Priorities: National Priorities for Rare and Threatened Biodiversity on Private Land Ministry for the Environment, Department of Conservation April 2007.

New Zealand cities, peri-urban areas and biodiversity

'In New Zealand more than 87% of the population are urbanised".

Clarkson, Wehi, Brabyn 2007.

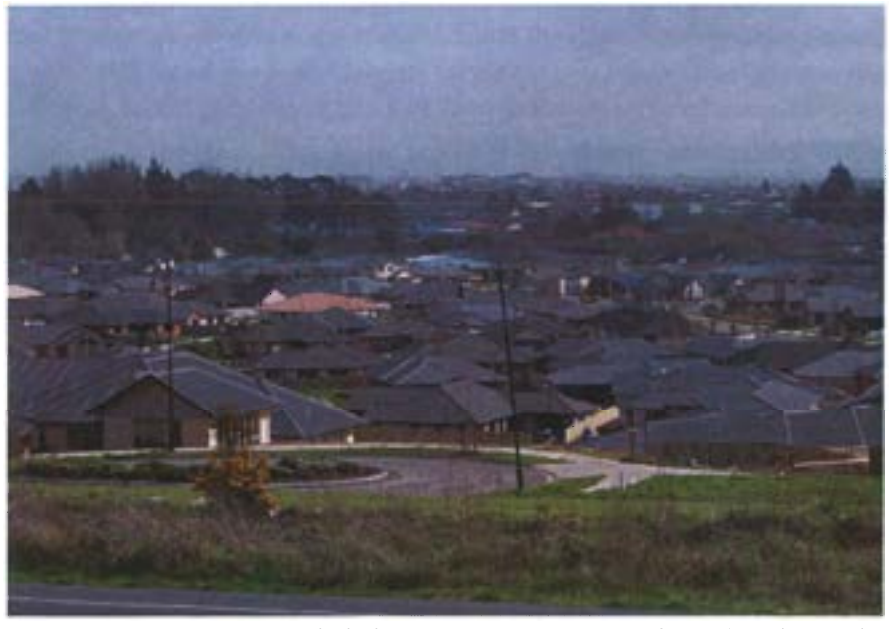
Urban growth and small-lot (principally peri-urban) development has recently been identified as a land use change with significant implications for biodiversity in New Zealand. The Parliamentary Commissioner for the Environment was concerned that planning processes were leading to a 'death by a thousand cuts' and prompted an investigation into sustainable development in peri-urban area.

"Intensification of land-use, whether for residential purposes or intensive productive use, is common in fertile lowland and coastal areas. It is these same areas that originally hosted the greatest diversity of species and now contain some of New Zealand's scarcest habitats and ecosystems. Hence, development in these locations inevitably stresses already delicate and highly fragmented systems".[27]

While there is not a great deal of New Zealand research, overseas studies would suggest that the higher the population the higher the number of endangered species and ecosystems. This appears to be the case in New Zealand.

Protecting biodiversity values in urban areas and the urban fringe is especially challenging. In these areas there is extensive removal, reduction and fragmentation of green or natural spaces to make way for development. Environmental pests such as weeds (which are strongly connected to urban gardens), feral cats, rats and ferrets, increased pressure from recreational activity and urban infrastructure projects including roads also increase the pressures.

However, the small remnants of green space and natural habitat in cities are valuable for maintaining and supporting biodiversity. They can provide urban people with a sense of connection or enjoyment of natural areas. They can also assist with the way natural areas are connected to created vital 'stepping stones' or 'corridors' for wildlife to travel through.



New subdivisions expand the built environment into more natural areas (Hamilton North).

[27] Final Report of the Ministerial Advisory Committee on Biodiversity and Private land 2006 – Ministry for the Environment New Zealand.

In commenting on the effects of urbanisation and peri-urban development the Commissioner for the Environment has been quite clear that we need to:

"Provide for and balance the requirements of increasing population pressures and demands (including places for settlement, commerce, recreation and tourism) with requirements for a good quality of life, and ecological sustainability".[28]

Researchers from the University of Waikato have recently supported the important role of cities. *"With the current upsurge of urban restoration in New Zealand it is timely to consider the potential of urban areas to successfully contribute to national biodiversity goals".*[29]

The researchers compared data from 20 of New Zealand's largest cities to measure progress in bringing back nature and to *"consider the perfect city from an ecologist's perspective"*. This included consideration of the types of ecosystems and numbers and types of iconic species successfully breeding or regenerating. The results showed that many of the cities are performing moderately. Less than a 10% urban indigenous land cover was believed to have a negative impact on urban biodiversity.

"Nine of the 20 cities in the study reached a threshold of 10% indigenous cover approximately 5km from the urban core and at 20 km only 12 cities reached the threshold."

The research paper goes on to suggest that cities offer special opportunities for conserving biodiversity influenced by the numbers of people exposed to, opportunities to volunteer or participate in biodiversity improvements and, the absence of grazing animals.

Increases in biodiversity would depend upon an increase in the extents and types of ecosystems in cities. Urban parkland was considered useful. While there is often an increase in human disturbance parkland can provide food sources and shelter for native birds. It can be an additional resource for restoration of depleted ecosystems. However the small size and fragmented nature of these areas limits their value. The research team proposed that the:

"Protection of large fragments in the peri-urban zone is clearly the best way to ameliorate some of the effects of small fragments in urban area".

Cities, towns and the areas around them also often disconnect or break up natural areas. As cities rapidly expand into outlying farming areas green space is inevitably lost and built over with hard surfaces such as roading, concrete or paving. As cities 'infill' green space with residential or commercial development gardens are being built over. In some high density residential areas there are examples of housing surrounded entirely by sealed surfaces, patios and decks with no soils or planted areas. The channelling and piping of streams is also extensive in urban areas.

However, biodiversity is not well included in 'sustainability' planning.

"Many landowners, regional and territorial authorities are reluctant to acknowledge that indigeneous biodiversity loss is a resource management issue for which they have responsibility."[30]

[28] Superb or Suburb: International Studies in Management of Icon Landscapes – Parliamentary Commissioner for the Environment.

[29] A spatial analysis of biodiversity patterns and implications for ecological restoration in urban centres, New Zealand – B.D Clarkson, P.M.Wehi, L.K. Brabyn.

[30] Mark Bellingham – Chapter 5, Handbook of Environmental Law, Wellington.

Biodiversity in the Waikato

"In fact, if everyone in the world lived the way people in the Waikato do, we would need about three earths to produce our resources and absorb our wastes"

Envirocare edition 50, March 2007.

The Waikato Biodiversity Forum was established in 2002. It is made up of representatives of research and management agencies, iwi groups, private landowners and community groups. This forum recently published a guide to *Restoring Waikato's Indigenous biodiversity: Ecological Priorities and Opportunities*. The guide seeks to raise awareness of Waikato's ecosystems and the threats to these. It provides guidance to assist communities and interested groups to undertake or participate in restorations projects.[31]

The Waikato Biodiversity Forum identifies priorities for the Waikato as:

- **create** ecological 'corridors'
- **reconnect** fragmented ecosystems
- **return species** that have been lost
- **buffer** the edges of wetland, rivers, lakes and other key ecosystems
- establish **pest free areas** on islands and the mainland
- **reconstruct** rare ecosystems and those that may have disappeared from the Waikato.

Many towns around the region and in particular Hamilton city are growing both in population and size. Hamilton is the largest inland city and 4th largest urban area in New Zealand. It sits in the centre of the richest pastoral and agricultural region. The longest river and biggest lake are both situated in the Waikato.[32]

The ecological footprint[33] of the Waikato region is an average of 5.8 hectares per person compared with a world average of 2.2 hectares. New Zealanders need to reduce consumption and waste. However this footprint also means it is vital in the Waikato to plan for and protect both productive and natural green areas. These will support the needs growing populations over time.[34]

"The native vegetation (mostly forest and scrub) which still covers 25% of the region is fragmented into tiny patches. The vast majority are less than 25 hectares, separated from each other by pasture, plantation forest and towns".[35]

The ecosystems that are most under represented in the Waikato are coastal, lowland (including wetlands) and submontane. The higher and less accessible terrain is better represented. This includes montane and alpine ecosystems. It is significant that the majority of urban areas exist in coastal and lowland environments. In the Waikato over 100 species are threatened with extinction and only one quarter of the vegetation that once covered the region remains today.

[31] Restoring Waikato's Indigenous Biodiversity: Ecological Priorities and Opportunities (Environment Waikato, Waikato Biodiversity Forum) 2006.

[32] Hamilton City Council www.hamilton.co.nz/ cityinfo.

[33] An ecological footprint is the area of land needed to produce a persons resources and absorb their wastes (such as foods, fuels, trees to take up greenhouse gases).

[34] Envirocare issue 50, February/March 2007.

[35] Restoring Waikato's Indigenous Biodiversity: Ecological Priorities and Opportunities – Waikato Biodiversity Forum 2007.

Animal pests are a significant threat in the Waikato. Historically, possum control has been supported by funding from the Animal Health Board for the reduction of bovine TB. This has brought about huge benefits for Waikato's native forests. In areas that have been treated for possums their have been noticeable improvements in biodiversity.

"Some animals kill trees by eating leaves and bark or by compacting soil with their hooves. Animal pests also interfere with plant breeding by killing the animals that pollinate flowers, spread seeds or by eating and trampling the flowers, fruits and seeds."[36]

Animal pests, especially possums, rats, ferrets and feral cats, eat young birds, eggs and lizards. This reduces the breeding success of important native species.

Plant pests also cause problems overgrowing and squeezing out native plants that may be good food sources for birds and insects. Cities and town gardens can be the source of new plant pests (introduced as ornamental garden plants). They can also act as seed beds for already established plant pests such as Woolly Nightshade. Seeds can be carried by birds, animals or vehicles into more natural areas. In suitable growing conditions these pest plants can significantly damage native bush and other green spaces.

Environment Waikato has undertaken a good range of activities and has committed significant resources into activities, which help manage the regional biodiversity. These include: education, pest control, resource consent regulation, research and advocacy and financial contributions to other stakeholders undertaking work to benefit biodiversity.[37]

A walkway from the edge of a city reserve connects city people to the wider natural environment (Hamilton view from Tills Lookout into the rural area).

[36] Restoring Waikato's Indigenous Biodiversity: Ecological Priorities and Opportunities – Waikato Biodiversity Forum 2007.

[37] Biodiversity and Natural Heritage: Progress towards Environment Waikato's Regional Policy Statement objectives 2007.

Case study

Hamilton Halo project

Background

The importance of improving biodiversity in New Zealand has been on the rise since 1992 when New Zealand signed the International Convention for Biodiversity Protection.

Although the growth has been gradual, Environment Waikato has always undertaken some work that had indirect biodiversity benefits. This included the Clean Streams Project, focused mainly on water quality, and possum control directed primarily at bovine Tb control.

New Zealand Tui.

Within the Waikato the number of initiatives to either protect or enhance biodiversity was also on the rise. Community groups, such Tui 2000 in Hamilton, gully restoration projects and Lake care/tree planting groups were, and still are, also doing good work.

Environment Waikato had also undertaken some significant planning and policy changes to better implement the intention of improved biodiversity. These included: increasing the importance of, and focus on, biodiversity in public planning documents such as the Long Term Community Council Plan. For the first time biodiversity had its own dedicated page in planning documents. Also, a Natural Heritage Fund was proposed and implemented to fund significant projects with natural heritage/biodiversity value.

Hamilton City Council also worked with, and still does, a range of very good environmental initiatives such as *The Gully Restoration Guide* and Lake Waiwhakareke (Horseshoe Lake) re-establishment.

University of Waikato ecologist, Bruce Clarkson, and Landcare Research scientist, John Innes have undertaken considerable research which has added great value to the quest to understand aspects of biodiversity restoration close to urban areas.

Photos: Nga Manu Images

Over the last three years councillors at Hamilton City Council and Environment Waikato reported a desire to have assistance in improving biodiversity inside the city. Councillors had noted the presence of animal pests such as ferrets, rabbits and rats in city reserves. City councillors felt that in addition to plant pest management more could be done about animal pests within the city itself.

The application of a targeted rate for both Natural Heritage and biosecurity began to focus the attention of city decision makers and residents on protecting biodiversity.

An 'urban' biosecurity rate was applied to all properties less than 2 hectares in size. A 'rural' rate on larger properties already existed. This dual rating system was designed to reflect the spread of benefits that were produced by Environment Waikato's pest control programmes, many of which were related to agriculture. However, both rates contributed to the Council's pest control programmes rather than being directed to 'urban' or 'rural' projects.

In June 2007, the Council changed its rating system to reflect the greater emphasis on doing pest control to promote biodiversity. Biodiversity is seen more as a 'public good' and so the Council eliminated the urban/rural split and based a single rate on capital value. The Council concluded that this more accurately reflected the benefit spread of pest control associated with biodiversity.

A separate targeted Natural Heritage Rate funds projects with significant biodiversity enhancement objectives in partnership with other stakeholders. The most significant recipient has been Maungatautari Ecological Island Trust for a pest free sanctuary around Mount Maungatautari.

In January 2007 Environment Waikato initiated a meeting with John Innes, a scientist working for Landcare, to investigate some ways to improve biodiversity within Hamilton city with a reference to bringing back the tui. The main outcomes of this initial meeting were that efforts focused purely on killing animal pests within the city alone would fail to bring back the return of the tui.

It was apparent based on the recent scientific research from Landcare that the focus needed to be on the peri-urban/rural fringe around Hamilton up to a 20km radius. Once gains were made in this zone efforts to reduce pests within the city would add more value.

"Landcare Research has been researching tui since 1999, via seeking reports of public reports of tui presence, as well as colour leg banding and radio transmitting of individual tui. Basically tui visit Waikato towns and Hamilton May-October when they are not nesting. These tui nest mainly in remnant forests on all surrounding hills, plus a few isolated planted areas, such as at Taitua arboretum. The few nests we have found suggest a low nesting success (25%) due to predation as is typical for all New Zealand forest birds."[38]

[38] John Innes – Landcare Research – personal information supplied to the Halo Project Team at Environment Waikato 2007.

For these reasons the focus was on locating and protecting current closest nesting attempts. As no tui currently nest in the city the benefit of pest control to increase rare native birds is limited. However, killing ship rats and possums in surrounding forests will also benefit kereru and bell birds.

From this starting point the Hamilton Halo project was developed. A concept was proposed and presented to a multi-stakeholder forum in March 2007.

Project description

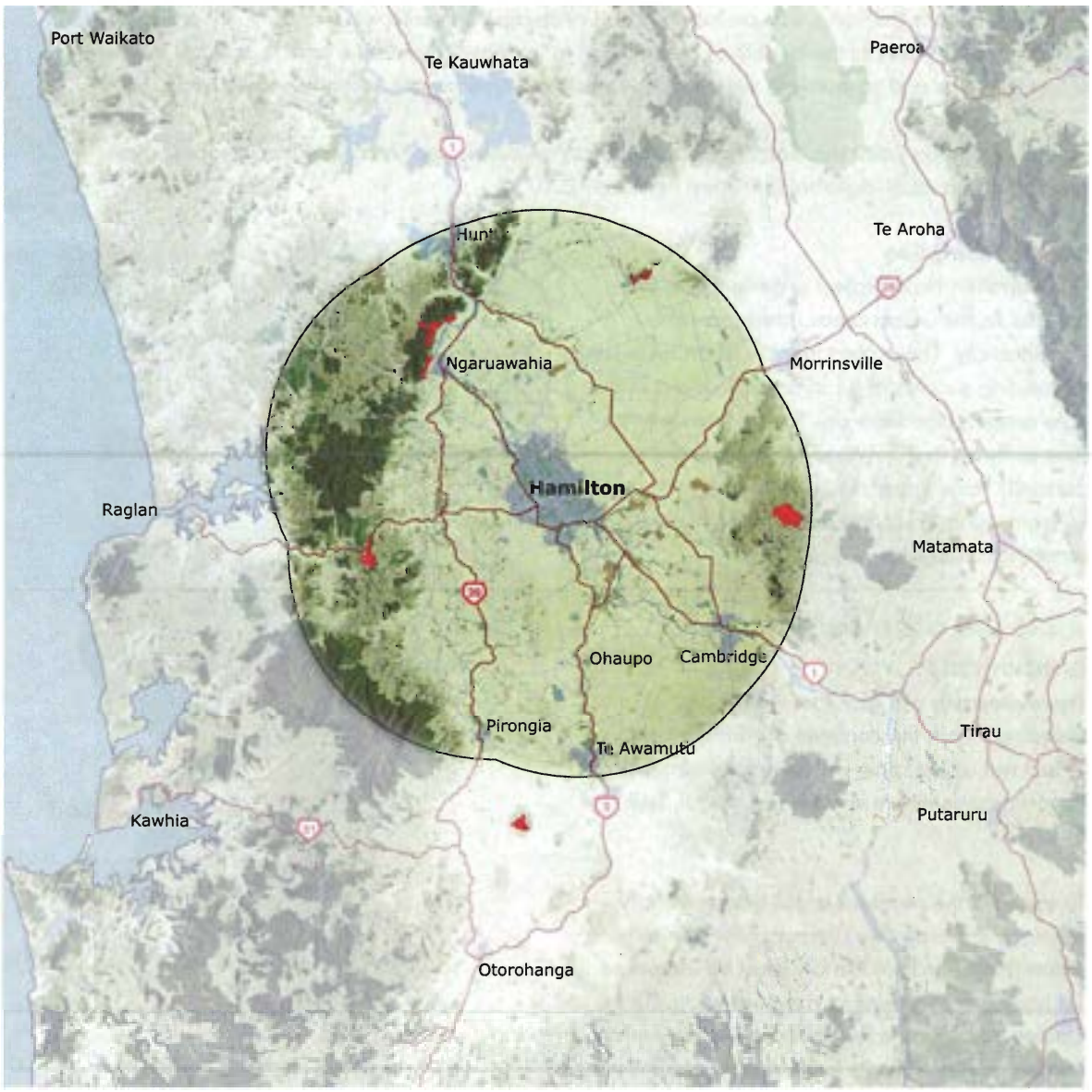
The Hamilton Halo project is designed to bring back tui to the urban areas, predominantly Hamilton city. The project is focused on increasing the nesting success of tui in areas within a 20km halo around Hamilton city. Tui are known to be able to fly up to 20km and while there are presently none known to be breeding in the city, tui from within this zone are regular visitors to some Hamilton sites.

Tui to the city means improved biodiversity

There presently are no tui known to be breeding within the confines of Hamilton city. In fact not unlike other urban areas Hamilton city has few iconic native species like the tui, bell bird or kereru.

To increase the numbers of tui visiting the city regularly the breeding success of tui within the 20km 'Halo' around the city must be increased. Tui have a winter feeding range of up to 20km. Studies by Landcare Research has tracked small number visiting the city from outside areas during the winter. In the summer the same tui are found breeding in forest patches within the 20km zone.

Kowhai – a favourite food source of the tui.



The map shows Hamilton City in the middle of a 20km radius defined in the project as the 'Hamilton Halo.'

While the Halo project is initially focused on tui as an indicator of better biodiversity it will have a positive effect on other birds such as bell birds and kereru.

"This pest control will by no means benefit just tui. It these birds are nesting in bush areas planned for pest control (which they probably are) then their success will increase dramatically, just as for tui."[39]

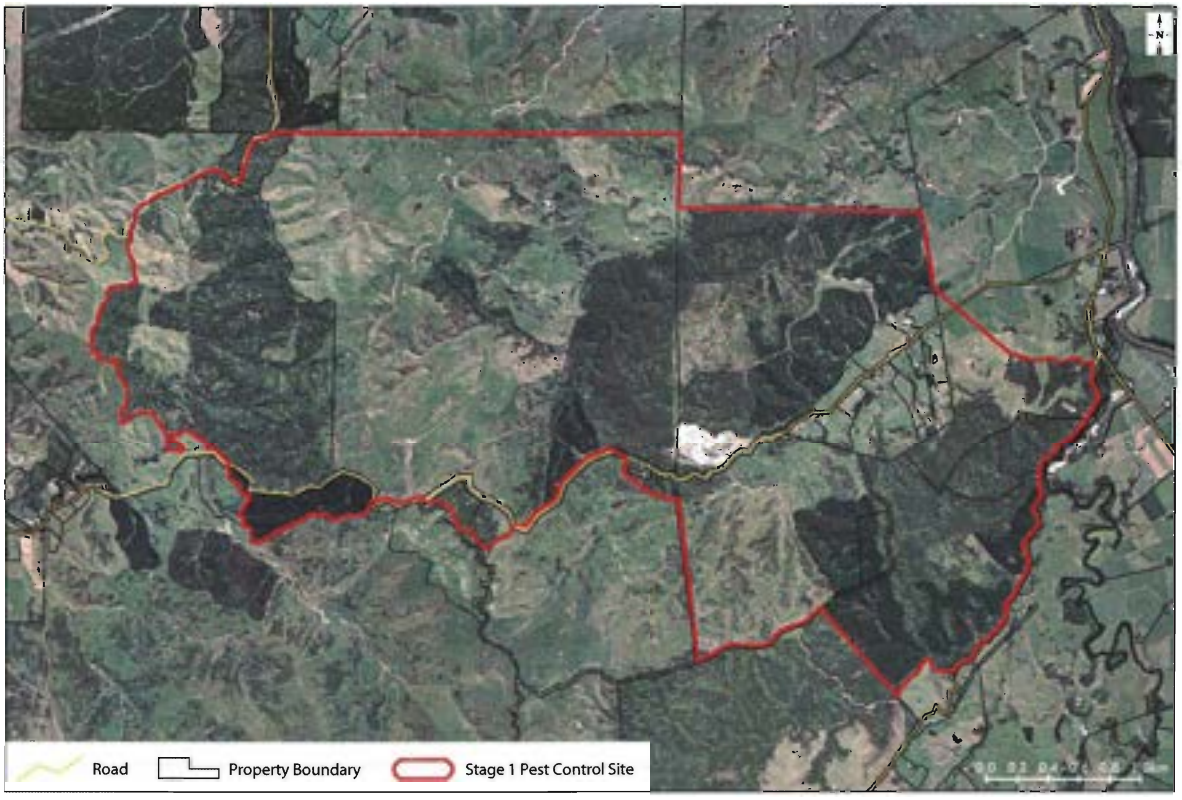
Possum and rats are the main threats to the breeding success of tui. Currently the success rate is around 27%. Ship rats and possums are very good climbers and are able to reach high nests. They eat both the bird eggs and fledgling birds. Possums and rats also eat seeds and plant life and so it is believed that the Halo project will bring about the added biodiversity benefit of bush enhancement, extra food for birds and a better habitat of both bird and invertebrates.

[39] John Innes (Landcare Research), pers comm. (August 2007).

Past pest control has concentrated pre-dominantly on killing possums. Killing rats (especially in mainland areas) is a much more intensive exercise and will require some trialing and monitoring.

Stage one – getting started

A site approximately 15 kms from Hamilton city and known to contain breeding tui that visit the city was selected as the first site for pest management. Work was undertaken with the landowners and pest contractors to devise a suitable plan.



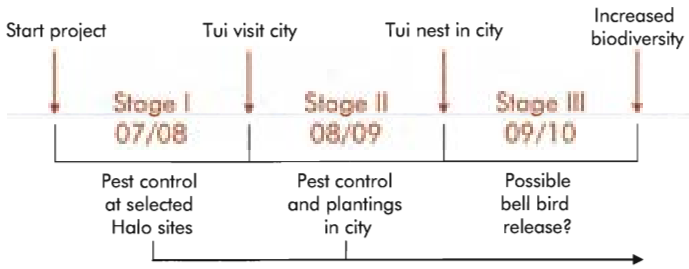
Old Mountain road – the site of stage one pest control.

Controlling rats is a very much more intensive operation than that required to knock back only possums. It requires much greater densities of bait over the ground area as rats travel a limited distance from their nesting sites for food. Also it is not fully known how many times the area needs to be treated to reach the desired low ratio of rat numbers. This makes the operations more costly and time consuming. It also means that the project is a learning experience for pest control contractors and project managers. Careful monitoring of rat numbers after each poison drop will be required to set up future regimes for successful rat control. Limited rat control of this nature has taken place in mainland areas (except in fenced off pest proof areas).The pest control was undertaken over early October. A further operation will be undertaken in March 2008.

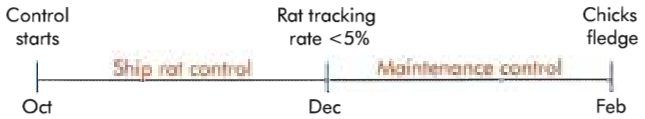
Stage two – looking forward

Hamilton City Council, community groups and interested residents ultimately want biodiversity within the city limits to improve. This will require a coordinated and integrated approach to improving the habitat in the city. Hamilton city's ongoing efforts to improve gullies (though native plantings and restoration) and reestablish a natural habitat at Lake Waiwhakareke will have a significant impact. Continued plant pest control, support for community planting projects and environmental education to engage residents to contribute food sources in city gardens are important. Once stage one has improved the breeding success of tui (and other birds) within the 20km Halo then intensive pest control (ship rats and possums) at key ecological sites in the city will help provide a safe habitat that may enable birds to breed in the city.

Hamilton Halo project goals



Stage one plan – Old Mountain road



Early milestones and achievements

The range of stakeholders taking an interest in the project is heartening. The landowners in the stage one area are also delighted to be part of the project. The following initiatives have taken place to date:

Backyard biodiversity – Hamilton Halo Factsheet
A colour fact sheet was produced to inform people about the Halo project and how they can support the project with initiatives in their own backyards. '*Backyard Biodiversity*' provides information about where and how tui breed, the main threats (particularly ship rats and possums) and how people can help to identify and reduce these threats. It also provides information about plants that can help attract tui to city gardens as well as pest plants can spread and compete with more desirable plants. This fact sheet will go out to any promotional displays or interested members of the public who require more information.


Backyard biodiversity

1

Hamilton Halo

The Waikato region is made up of a diverse range of ecosystems, plants and animals. However it is also one of the regions with the greatest indigenous biodiversity loss in New Zealand. Approximately 75 per cent of the natural areas on land in the Waikato region have been lost, with 223 species now threatened with extinction. Under the Resource Management Act territorial authorities are tasked with the responsibility to manage biodiversity on private land.

Unlike other urban areas, Hamilton city has very few iconic native species like tui, bellbird and kereru. These species are important pollinators and dispersers of native plants, and are also highly valued by residents of the city. Environment Waikato designed the Hamilton Halo project to help bring some of these native birds back into urban areas, starting with a key iconic species of the Waikato – the tui.

Tui have a winter feeding range of up to 20 kilometres, when they are known to commute into the city from summer nesting forests to feed on native and exotic plants. Small numbers of tui have been tracked returning from the city to forest areas outside the city. Landcare Research studies show that some tui visit Hamilton each year between May and August. However no tui are recorded in Hamilton during the breeding season.

To increase the number of tui visiting the city, breeding success must increase in the forest ranges. Unfortunately results from recent studies have shown that tui nesting success is very low – only about a quarter of monitored nests fledged young at all. This is mainly due to the high population of ship rats and possums, which climb trees and invade tui nests, eating the eggs and chicks. To improve nesting success, Environment Waikato carries out annual rat and possum control at selected high priority sites in a 20 kilometre feeding range radius (halo) around Hamilton city. A map of the halo area is available on our website.

Environment Waikato also works with land owners to control pests at key habitat sites within the halo so the numbers of pests – possums and rats – are reduced before tui start to breed each October, giving the chicks a fighting chance of surviving to fledge. More tui surviving to leave the nest will mean more birds going out to forage, visiting Hamilton city and its surrounds. Other benefits of this pest control that could result are an increase in the variety of other birds, plants and invertebrates (worms, snails and other important insects).

The Hamilton Halo project works with Hamilton City Council and land owners to achieve pest control and plantings at key sites within the city, to provide safe habitat for tui to breed once they have begun to visit the city regularly. Whilst the project is focused on tui, it is hoped the pest control efforts will attract other birds to live and breed in the city, such as bellbirds.

Nursery/gardencentre support
A communications package was created to assist garden centres/nurseries to market and sell plants that tui like to feed on. This consisted of garden centres doing a promotion on tui favorable plants with Environment Waikato providing fact sheets to accompany any displays. To date this has received a favourable response by the nurseries who participated. This is very important as the Halo project has some very specific outcomes in relation to increasing the breeding success of tui that visit the city, but recognizes the importance of supporting complimentary activities within and around the city. Seven nurseries in and around Hamilton were involved.

Combined biosecurity committee fieldtrips
On Friday August 17 the members of the Biosecurity Subcommittees were invited to attend a field trip to see the site for pest control for stage one of the project. About 20 members and other interested stakeholders attended the trip. On site people heard from the landowners, the pest contractors, scientist John Innes of Landcare Research and Biodiversity staff from Environment Waikato and were able to view the site alongside relevant maps.


Tui friendly plants are promoted at Garden centres.

A school holiday programme was run at the **Hamilton City Libraries** in September. This utilised the 'TuiTime' educational resource designed by the New Zealand Ecological Society. A children's factsheet with information, plus a quiz, wordfind, crossword and colouring in competition was produced. The libraries were very enthusiastic about running the programme.


The Hamilton Halo project

Bringing tui back to Hamilton

Tui are common throughout New Zealand in forests, some towns and on off-shore islands, but scientists have found that Hamilton does not have many tui at all. This is because in the native bush around Hamilton (where tui live and breed) there are too many rats and possums that eat tui eggs and chicks.

Hamilton Halo

Up to three quarters of all the tui nests around Hamilton are destroyed by predators. Environment Waikato has started the Hamilton Halo project to help tui by making sure there are not too many predators in the forests when tui are laying their eggs. If tui nests are made safer then more chicks will survive to be old enough to fly. Tui teach their chicks where to find food, and there are a lot of plants for tui to feed on in Hamilton. If we can make sure more birds survive when they are in the nest then we should start to see more tui in Hamilton.

The Hamilton City Libraries want to help you to learn more about these special birds and the threats they face. At the library you can explore the website TuiTime which will teach you about:

- the lifecycle of the tui
- the special features tui have
- what tui eat
- predators that threaten tui
- how we can control predators to make safe places for tui to live.

Tui are dark coloured with a metallic blue-green sheen and a unique white ruff under their throat. You will often hear a tui before you see it – when tui sing they make all sorts of different sounds, combining bell-like notes with clicks, chuckles and wheezes.

Predators

A predator is an animal that hunts and eats other animals. Ship rats and possums are predators of tui.

Hamilton City Libraries

Other communication projects underway

The **Environment Waikato website** features information on the project. The site provides greater detail than the fact sheet and more detailed maps. It also provided information on participating garden centres and links to related useful websites. Eventually it is proposed that the site might feature audio and video clips of tui and tacking details.

Challenges

There have been a number of challenges in setting up the project.

Getting community organisations, local territorial authorities, Department of Conservation and environmental interest groups together to hear about and offer feedback on the project was reasonably straight forward. More than a dozen people representing eight organisations attended a multi-stakeholder forum and the levels of discussion and enthusiasm was good. However, getting stakeholders to commit resources, particularly funding, was extremely difficult. Most people in attendance were able to offer support in principal and in some cases in-kind resources. By and large stakeholders offered a range of 'complimentary' support through the potential better alignment of their own conservation/environmental enhancement efforts. Most organisations and groups had limited funds themselves and their own priorities.

For example, Waikato Federated Farmers supported the concept and valued the outcomes but were unable to commit funding support. The group stated:

"We feel that this is a project that will be beneficial to the rural and urban communities in the Waikato, not only with regard to addressing the biosecurity problems that keep the Tui away, such as rats, but also in the eventual increase in tui numbers to the Hamilton area."[39]

Nevertheless, they declined to support the project financially.

Media interest was good in the initial stages although the 'killing of rats within the city' was seen as appealing. It was difficult to convey the idea that it is the pest control work around and not within the city that would bring the quickest gains for the city itself.

The project attracted both some positive and negative public attention though letters to the editor. This was influenced by the public local body elections. To some people spending ratepayer monies on bringing back tui was not justified. Some did not place any value on the projects goal while others did

[39] Personal correspondence: Waikato Federated Farmers 16 July 2007.

not want to pay what they perceived as additional rates. Some views implied that biodiversity projects of this nature are nice but not necessary. However, there were also people who understood and supported the project.

In August 2007, an article about the distribution of bird numbers across New Zealand entitled *"Waikato called 'bird desert'."* increased community focus on the urgency of the project. Authors of a new atlas on New Zealand birds were concerned about the effect changing land use and farming in the Waikato.

"The lack of birds is especially noticeable in the Waikato, where increasing dairy farms means endemic species like Tui are increasingly a rare sight."[41]

Getting information out to the general public at large has been a little more difficult. Environment Waikato publications such as the EnviroCare and press releases would have reached many homes. However, it takes a while until any one activity of Regional Council gains a significant profile. Staff and Councillors were able to share information as guest speakers to community groups. Information was also distributed with rates notices, on Environment Waikato's web site and via garden centres.

Political engagement in the project was initially reasonable but was hampered by the local body elections. Once both Councils are re-established in October a greater level of political engagement particularly within the city will be pursued. Although city councillors have received personal correspondence about the project the level of understanding about the project is still not high. The project will be best understood in the context of biodiversity and biosecurity needs for cities.

Pest control for ship rats is very costly and the techniques are relatively untried beyond off-shore islands. Due to the high costs only one site within the Halo could be included this financial year. The costs are estimated to be around $120,000 for intensive possum and rat control at the flagship site at Old Mountain Road Bush.

On-going challenges:

- securing long term and additional **funding partnerships**
- gaining full **political engagement** within the city and the territorial authorities within the halo zone
- increasing **partnership in complimentary activities** (such as planting, education, communication)
- gain better **integration and coordination** of relevant activities of all key stakeholders
- **engage the private sector** (the funding or environmental enhancement potentials of private business need to be better explored)
- Building or **increasing the capacity of community and voluntary groups** to participate. This would include groups with similar goals such as Tui 2000, motivated land owners and individuals.

[41] Waikato Times Wednesday August 15 – NZPA, Fairfax.

Going forward in New Zealand

Central, regional and local government supported by community groups are making sound progress towards improving aspects of biodiversity in New Zealand.

However, it is clear that while New Zealand has a strong commitment to enhancing biodiversity there is considerable progress to be made to educate, engage and empower rural and urban communities. Land must be managed in a way that elevates and protects biodiversity values.

This will include helping people to understanding landscape values and the impacts of human activity on the environment. Furthermore, city people will need to recognise and balance the effects of an urban lifestyle on biodiversity values. This will mean understanding the way that cities rely on natural resources outside city boundaries and the necessary priorities for biodiversity enhancement within and around cities.

All development, including redevelopment, infill and new residential and commercial development in urban areas should plan for biodiversity. Urban planners and developers must consider the cumulative effects of human activity and net losses in the environment. These must be balanced by sound land management on site or elsewhere (such as green reserves in or around urban areas).

Ecologists Clarkson, Wehi and Brabyn[42] suggest that further research is required to understand the role of urban areas in supporting biodiversity.

"As yet the value of natural ecosystems in cities is poorly known, as many cities do not have inventories or databases which quantify these areas."

They also describe the integration of science as 'woefully inadequate'. This supports the globally accepted view that planners and scientists will need to work more closely together.

The need to form stronger working relationships between municipal and regional authorities is supported because of the need for 'integrated urban-peri urban actions' and some consistency in dealing with land management across territorial boundaries.

"The practice, the technology and the experience are now available to more effectively and sympathetically manage all classes of land. Increasing numbers of landholders are deriving economic benefit while at the same time sustaining and enhancing natural values".

Ministerial Advisory Committee on Biodiversity and Private Land 2007.

Rural areas close to cities are increasingly popular for lifestyle subdivisions (West of Hamilton.)

[42] A spatial analysis of biodiversity patterns and implications for ecological restoration in urban centres, New Zealand – B.D Clarkson, P.M.Wehi, L.K. Brabyn.

The Parliamentary Commissioner recommends for example that:

"Where native plants on working lands provide both private and public benefits the role and potential of cost sharing between public agencies and landowners be assessed".

He acknowledges cross-boundary issues are a problem and poses the question as to whether more national guidance is required and what extra support would be required to help smaller district councils. The ministerial advisory committee also noted the role of politicians and officials in local and central government to facilitate biodiversity initiatives on private land.

The Ministerial Advisory Committee report[43] proposes a vision of quality biodiversity management. This includes:

- recognition and encouragement (such as awards and certification schemes),
- education (across all ages),
- assisting (advisory service – free),
- supporting (financial),
- securing (purchasing land or putting into permanent protection).

The report also states that while all levels of government should be involved it is particularly regional councils that need to show leadership in this area.

The need to prioritise has also been reaffirmed recently. *"Stating what our priorities are for protection on private land will assist with improving co-ordination between our central government work and the important work being undertaken by local government, landowners and other groups."*[44]

The Government has recently proposed **four national priorities**:

1. Land areas with only 20% of their original native value left.
2. Wetland and sand dunes.
3. Ecosystems that have always been limited in extent, such as geothermal areas, along coasts and on limestone formations.
4. Protection of the habitats of New Zealand's most threatened species.

In planning for local biodiversity improvement both the amount of ecosystems and more importantly the quality of them and connectivity the ecosystems must be considered.[45]

Urban streams are under pressure but can be important ecological corridors (Memorial Park – Hamilton.

[43] Final report of the Ministerial Advisory Group on Biodiversity on Private Land (2002) – commissioned by Ministry for the Environment.

[44] Former environment Minister David Benson-Pope 2002 (Press Release). www.mfe.govt.nz.

[45] Biodiversity and Natural Heritage: Progress towards achievement of Environment Waikato's Regional Policy Statement Objectives ISSN 1174-7234.

It might mean planting native forest 'stepping stones' or continuous streamside, road or rail side vegetation to allow animals to move between larger forest patches. It will be important to reconnect fragmented ecosystems and to create corridors of both terrestrial and aquatic ecosystems.

"If we as a society choose to nurture our indigenous biodiversity we must be prepared to actively manage all our land by standing between our threatened species and their vigorous competition and predators. Such a commitment will be permanent and at on-going cost-be it on reserve, residential or productive land".

John Kneebone Chair – Ministerial Advisory Committee on Biodiversity and Private Land.

With the reserves, gully restoration and Lake Waiwhakareke combined Hamilton city will meet a target of 10% biodiversity resource within the next 20 years. Therefore for Hamilton city, retaining a focus on the reconstruction of a wetland/lowland ecosystem at Lake Waiwhakareke coupled with gully restorations, plantings in green reserves and transport corridors (as has been achieved along new arterial routes) will bring good gains in relatively short time frames.

It will be important to identify priority places for pest control around the city where intensive pest control will allow for populations to flourish. This will create the opportunity for 'spill over' into other areas including urban areas.

The establishment pest-free areas on islands and then on the mainland to act as refuges for wildlife and good seed sources for regeneration will also be very useful. In the Waikato, the Maungatautari Ecological Island Trust is providing a pest free sanctuary within a useful distance from many other key ecological sites and growing urban areas.

Urban restoration projects are vital. Lake Waiwhakareke (Horseshoe Lake – Hamilton).

ICLEI propose a five step plan for local and regional government.[46] This includes; gaining and communicating political commitment, assessing the current state of resources, drafting and consulting on a 10 year plan, formal acceptance of the plan with commitments in annual plans and the implementation of actions in that plan. ICLEI consider:

"Cities and regions to be crucial allies for communicating and implementing the 2010 biodiversity target".

The Ministry for the Environment recently put together a snapshot of Council effort to address indigenous biodiversity. The report noted:

"While many district councils have the capacity to engage in proactive biodiversity work on their own, a significant number have relatively low population bases and large geographical areas with significant competition for limited resources".[47]

The report shows that 54% of Councils (self reported) do not have biodiversity outcomes in their 2004 Long Term Community Council Plans (LTCCP) but may have some outcomes related to the balance between built and natural environments. However, most Regional Councils had policy statements to identify and/or protect significant natural habitat. Most district councils had rules relating to vegetation clearance but 23 out of 77 councils stressed the importance of voluntary methods for protecting indigenous vegetation or habitats and only 16 adopted *"extensive awareness raising and education programmes."*

The report identified the importance of good quality information and information exchange and the availability of funding to support work on the ground. The quality of information varied hugely as did the amounts of money allocated to biodiversity initiatives. The report noted also the significance of initiatives by private landowners to New Zealand's overall biodiversity.

"The results of the project clearly reveal that regional councils are providing significant leadership for biodiversity in their regions. Many are working with landowners and communities to protect and restore biodiversity values."

However, it will be increasingly important for district councils to develop and adopt sustainability, including biodiversity guidelines and action plans.

Summary of useful actions for improving biodiversity outcomes

The actions required in New Zealand to improve overall biodiversity outcomes essentially mirror the findings of international studies. They include:

- Buy-in of territorial and regional politicians.
- Good quality information and information sharing.
- Integration and coordination of all stakeholders efforts and resources.
- Effective, consistent and compatible policies and rules.
- Effective regulation and enforcement.
- Community Education and Awareness raising.
- Adequate funding and cost sharing.

[46] ICLEI – www.countdown2010.net.

[47] www.mfe.govt.nz.

Conclusions

The problem before us globally and locally is large and complex. However, we cannot be complacent about the state of our biodiversity. Urgent, focused action is required by all people to protect the natural resources vital for our future. People in cities can no longer afford to ignore the effects of urban lifestyles on our wider environment. We all need to focus on the value of our special natural places and the plants, insects, animals, minerals and other resources these places provide.

Political leadership will be required to create commitment to biodiversity conservation. This must be coupled with the formal acceptance of long term biodiversity action plans and the necessary funding to implement the plan.

Defining the current state of biodiversity resources is very important mostly to help create priorities where the best gains can be made. Ecosystems and rare species most at threat must attract priority attention and funding. At the same time supporting the community with other good biodiversity initiatives outside these priorities is an excellent way to harness people power and enthusiasm.

Cooperation and collaboration between all interested parties will improve biodiversity outcomes. Local and central government can have a role is facilitating communication and resource sharing between groups.

This will require empowering private landowners to protect biodiversity alongside the other values (economic and amenity) they enjoy on their land. It may also require gaining 'buy-in' from those who do not own the land but gain benefit from improved biodiversity values to assist landowners with land improvements that benefit biodiversity.

Presently, levels of both political and community understanding and buy-in vary considerably. As biodiversity protection or improvements are fundamentally tied in with land use, political support within territorial authorities will be essential. Sound collaborative working relationships between Regional and Territorial authorities are essential if real progress is to be made. Environmental resources do not stop at territorial boundaries and so cross-boundary collaboration is also vital.

As New Zealand attempts to improve biodiversity outcomes it will be necessary to have firm rules to prevent environmental degradation and to enforce these. Anything else creates a 'two steps forward and one step back' approach.

Even though cities will continue to develop and land use will therefore be changed, urban communities will increasingly need to understand the impacts of city activities on the natural environment. Increased awareness should lead to increased acceptance and valuing of biodiversity initiatives within and around cities.

Urban parks allow city people to enjoy nature (Claudelands Bush – Hamilton).

Gaining funding for work is not easy. Groups are still generally competing for limited funds. While greater amounts of money have been put into biodiversity initiatives on a national, regional and local level, the full costs of the effects on our natural environment are not yet being met. Stakeholders clearly need to debate this issue and decide upon reasonable cost sharing.

As a regional political leader and a city dweller I believe there is also an ethical imperative to protect these resources for future generations. I want to live in a modern city with a good standard of living. I also want this for my children. The global message is clear. Ignore the environment at our peril. Biodiversity is not a cherry on New Zealand's cake but an essential ingredient for a prosperous and high quality future for our cities and the land that surrounds them.

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