

## Saving threatened native plant species in cities — from traffic islands to real islands

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### ABSTRACT

While offshore islands offer a more traditional option for native plant conservation in New Zealand, urban landscapes including traffic islands and road reservations are now being used in the Wellington region as an integral part of plant species recovery. Urban environments offer areas of public land where plants can be grown on a long-term basis.

For many years exotic plants have dominated urban plantings, but increasingly native plants are being used. In Wellington and Hutt City, threatened native plants are now integrated within city plantings. When a council revegetates its urban areas native plant species offer many advantages over exotics. When threatened plant species are used there are even greater gains in terms of contribution towards protecting New Zealand's unique plant life. Threatened native plants grown in traffic islands are used as:

- Insurance populations in case the wild population is destroyed
- A research and educational resource
- A source of seeds and plants to be used in species recovery work in the wild
- An advocacy tool to promote the region's rare plant life.

Threatened plant species grown in traffic islands can be valuable components of a plant conservation programme, and can also be attractive parts of the urban landscape. They can be well protected from browsing animals, such as possums, by the surrounding roads. Council staff can also keep the islands free of weeds.

This paper describes the plant species recovery process, and illustrates the importance of urban landscapes for plant conservation. It also describes how plant conservation initiatives in Wellington depend on urban environments and on the use of traffic islands, and how these are tied in with real island restoration programmes. Presented here are examples of threatened species programmes in Wellington that rely on urban *ex-situ* management of threatened plants.

### INTRODUCTION

There are many well-documented cases of the importance of New Zealand's offshore islands for plant conservation (e.g., Walls et al. 2003) but many of these islands are a long way from people, often requiring Government permission to land. Closer to home, there is another type of island that provides similar opportunities for native plant conservation.

Traffic islands and road reservations are now being used in the Wellington region as an integral part of plant species recovery projects. This paper describes the plant species recovery process, illustrates the importance of

urban landscapes for plant conservation, and describes how plant conservation initiatives in Wellington depend on urban environments and on the use of traffic islands.

### PLANT SPECIES RECOVERY PROCESS

Plant species recovery can mean many things to different people. To some it means protecting species in the wild from weeds, stock and habitat development. To others it means cultivating the plant and maintaining it in a secure *ex-situ* location. To some it means translocation of species to new sites. To others it means monitoring the plants to ensure they do

not decline. The plant species recovery process described here includes all those components.

Fig. 1 shows a typical process for ensuring the survival of a plant species. Some organisations have established recovery groups and written recovery plans for threatened species. For example, the Department of Conservation has now prepared 17 recovery plans for a total of 50 acutely or chronically threatened plant species. While this is valuable, there remain a great many threatened species without a national recovery plan. Only 18% of nationally threatened plant species are covered by recovery plans.

The many and varied skills required to achieve plant species recovery and the length of time required, mean that integration of programmes across a wide variety of organisations and people is more likely to succeed. Collaboration is proving to be more effective than each organisation tackling its own plant conservation projects independently. That integration must involve urban-based conservation organisations and urban resources for biodiversity management.

### THE IMPORTANCE OF URBAN LANDSCAPES FOR BIODIVERSITY

There are three key aspects to urban landscapes that make them important for biodiversity. First, there are intrinsic biological values. Secondly, is the fact that those landscapes influence our understanding and appreciation of nature and our local biodiversity. Thirdly, there are the many resources available for biodiversity management.

Wellington City is certainly bestowed with a diverse biological infrastructure. There are four offshore islands (Taputeranga, Matiu/Somes, Mokopuna and Makaro/Ward islands) offering a variety of opportunities for ecological restoration (Fig. 2). There are two ‘mainland islands’ (Karori Sanctuary is one, East Harbour in the Eastbourne hills is the other, managed by the Mainland Island Restoration Organisation, MIRO). The Miramar peninsular also lends itself to intense biodiversity management because of the relative ease of maintaining pest free status compared with other mainland areas. There is also a diverse mix of plant communities from coastal dunes on the Wellington south

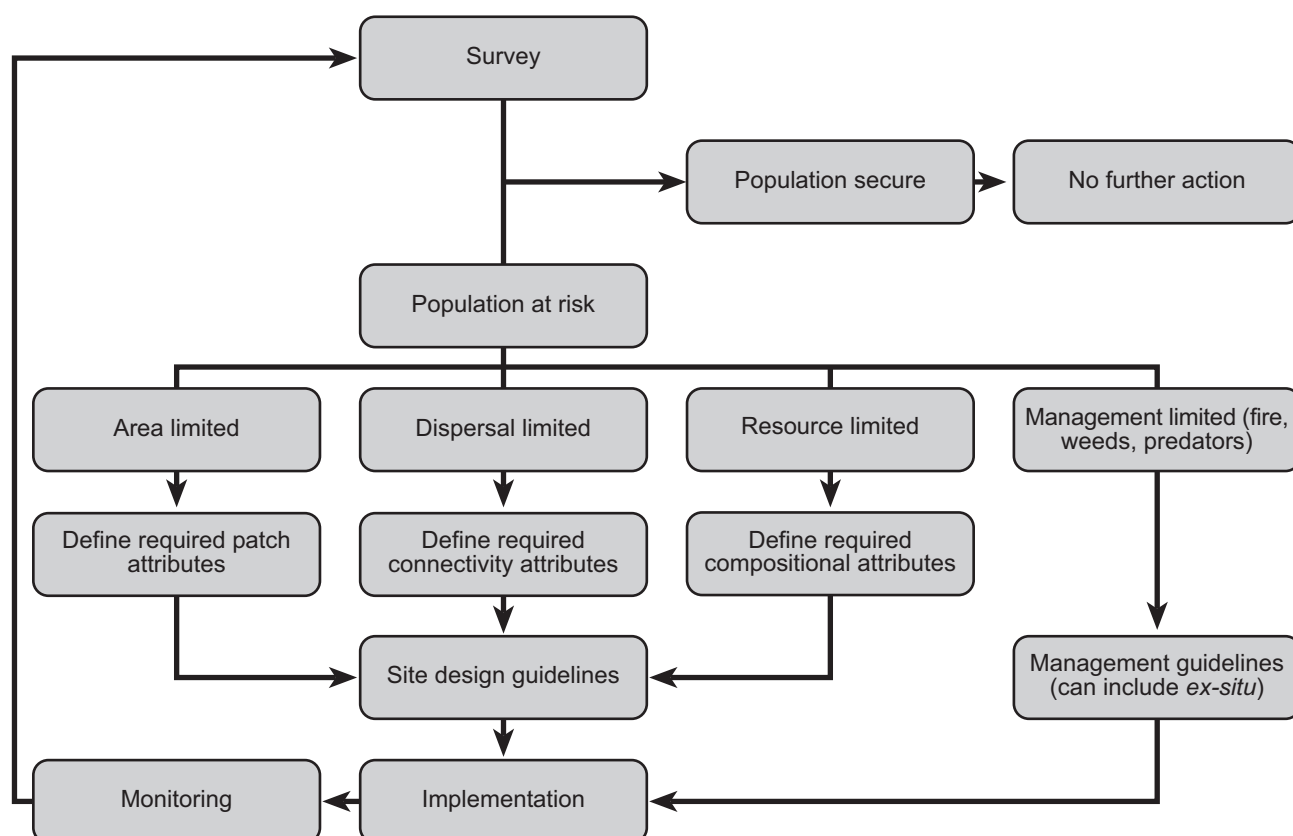


Fig. 1 Plant species recovery process.

coast to primary native podocarp and rata forest at Otari/Wilton Bush.

This proximity to nature otherwise known as the *'therapy of the green leaf'* raises public awareness and appreciation of local biodiversity. This is our nearest experience of nature. It is often where we first learn about rimu (*Dacrydium cupressinum*), kererū (*Hemiphaga novaeseelandiae novaeseelandiae*), tūī (*Prothemadera novaeseelandiae novaeseelandiae*) and pīngao (*Desmoschoenus spiralis*), and is therefore an appropriate place to introduce threatened, uncommon and common plant species. In 1969, Frank Fraser Darling noted that:

*'the near landscape is valuable and lovable because of its nearness, not something to be disregarded and shrugged off; it is where children are reared and what they take away in their minds to their long future. What ground could be more hallowed?'*

That means care and thought are required when managing and designing urban environments.

### URBAN RESOURCES FOR BIODIVERSITY MANAGEMENT

Urban areas have four key resources that, although not unique to them, make them valuable for achieving plant conservation goals.

#### 1. Botanic gardens, parks and parks staff

Parks and botanic gardens, and staff charged with their management, are vital for urban plant conservation efforts. Parks often support native plant and animal communities that are themselves of biological importance. These areas also provide sources of propagules for colonisation of the surrounding lands (including gardens).

A botanic garden is different from a park or public garden because it contains scientifically ordered and maintained collections of plants that are often labelled. Botanic gardens have additional importance because of the goals that they strive to achieve in terms of recreation, education and research as well as often being involved in conservation work.

Staff that maintain parks and botanic gardens have expertise in plant propagation, pest plant and animal control, and education. Many plant conservation achievements can be made by tapping this human resource and applying it to threatened species recovery goals. Without the support of parks staff many of these opportunities will be missed since the staff are often integral to the decision making behind what is planted in each area.

#### 2. People who grow plants and plant nurseries

Horticultural expertise within cities is considerable. This can be in the form of staff at commercial plant nurseries, private horticulturists or the gardener that is growing one or two species for planting out. These people are also integral to plant restoration programmes. The skill to grow native plants and especially threatened plants takes time to learn. In Wellington there are a great many people involved in growing plants either for restoration work, for threatened plant recovery, or for their own enjoyment.

For example, Arnold and Ruth Dench have been experimenting growing native Wellington plants over the past half century (Dench & Dench 2002). Robyn Smith has also been involved in research to develop techniques to grow some of New Zealand's rarest species. Gary James has been heavily involved with the Forest and Bird Home Nursery Scheme and has been growing many of Wellington's local rarities as well as many of the common native plants that would have once dominated the landscape. The importance of plant growers cannot be understated, and for that reason urban areas are vital because they are home to many of these people.

#### 3. A supportive and involved public

Urban landscapes are surveyed more intensively than any others. In Wellington, urban plant records of natives and weeds account for almost 50% of all records stored on the national plant database (BIOWEB) and yet urban areas only account for a fraction of the spatial area of the region. In urban areas the landscape is being monitored far more intensively and regularly than anywhere else

in the world. For that reason alone we must be mindful of the public interest in every action we take. Maintaining public support for how we develop 'their' home environment is vital and this will involve developing (and not rapidly changing) people's strong sense of place.

In Wellington there is an increasing number of community groups involved in revegetation initiatives, and especially involved in restoration of native species in urban areas. In 2003, the Department of Conservation's annual restoration open day was attended by over 130 people representing more than 90 different restoration groups. That growing concern in how the urban landscape appears, and to what degree native species are used, is an important consideration when designing urban planting programmes.

#### 4. Traffic islands and road reservations

The final resource, that is far more abundant in urban areas than anywhere else, is traffic islands and road reservations. These areas provide space to demonstrate, promote and protect plants whether native or exotic. The idea that these areas could be used for threatened plant conservation first came from Tony Silbery and Peter de Lange (de Lange & Silbery 1993). Since then the idea has been adopted and used in many situations and not just restricted to traffic islands. *Ex-situ* populations of threatened plants have now been established outside Department of Conservation offices and in botanic gardens. They are often planted in groupings to act as captive breeding populations for future species recovery work. Seed and cuttings are harvested from these populations for use in translocations. Threatened native plants grown in traffic islands are used as:

- Insurance populations in case the wild population is destroyed
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*Ex-situ* conservation can be used as an important tool for plant conservation, but must not be used to rationalise the destruction of wild

populations. Urban reserves, whatever size, may also be used for promoting common native plants local to the district (Fig. 3).

#### THE PROBLEM OF EXOTIC PLANTS

An exotic plant can be a species introduced to New Zealand from overseas such as climbing spindleberry (*Celastrus orbiculatus*) or evergreen buckthorn (*Rhamnus alaternus*). It can also be a species native to the New Zealand botanic region that has been taken out of its natural range by humans. Wellington examples include pōhutukawa (*Metrosideros excelsa*) and karo (*Pittosporum crassifolium*). Native plants indigenous to the area have many advantages over exotic plants. Exotics may spread and colonise natural areas. Their presence can also influence members of the public to plant them. Some exotics, such as boobialla or *Myoporum insulare*, will hybridise with native plants in the surrounding landscape, in this case with native ngaio (*Myoporum laetum*). In Wellington, the Chilean kōwhai (*Sophora cassioides*) has also been used instead of the nine species of *Sophora* native to New Zealand.

#### CASE STUDIES

##### *Muehlenbeckia astonii*

*Muehlenbeckia astonii* or the zig-zag plant (Fig. 4 & 5) is perhaps the most famous of Wellington's threatened plant species having appeared on the front cover of the city's newspaper. Since 1992, *M. astonii* has been established in at least six traffic islands throughout Wellington and Hutt Cities.

*M. astonii* is a good example of a species that has benefited from the traffic island approach (Fig. 6). The plant is found mainly in coastal areas in the southern part of the North Island to Canterbury in the South Island (Fig. 7). In Wellington Conservancy only 48 individuals are known in the wild, all occurring on private land and spread across a wide area. The apparent need for male and female plants to grow in close proximity to produce seed meant that the wild plants were effectively a sterile group of isolated specimens. However, each sub-population of the species had been established as a separate breeding unit on a number of traffic islands scattered over Hutt City, with



**Fig. 2** Matiu/Somes Island — one of Wellington’s three harbour islands. (Photo: J. Rolfe).



**Fig. 4** The nationally endangered shrub — *Muehlenbeckia astonii* growing in the wild.



**Fig. 5** The common name ‘zigzag plant’ for *Muehlenbeckia astonii* has come from its divaricating branching pattern.



**Fig. 3** Common native plants used in a traffic island in Wellington.



**Fig. 6** *Muehlenbeckia astonii* in a traffic island in Wellington City.

each plant close enough to the others to allow maximum opportunity for cross pollination within the group.

Ex-situ breeding stocks of one sub-population of *M. astonii* were used to generate 1500 cutting-grown plants. Those plants, along with associated plant species (*Olearia solandri*, *Coprosma crassifolia* and *C. propinqua*), were introduced to Turakirae Scientific Reserve (a protected reserve where *M. astonii* was known to have occurred; see Fig. 8). It is unlikely that such a large-scale project would have been achievable without the use of an *ex-situ* traffic island population. The introduction project is now being monitored to determine the most effective way to restore that species into the wild.

### Other examples

This approach has subsequently been used for other nationally and regionally threatened plants in Wellington. *Pimelea* aff. *aridula* is a nationally threatened shrub that grows at only one site in the Wellington region on the coast north of Makara. This species was brought into cultivation and managed as a captive breeding population in a traffic island in the Hutt Valley. Seed collected from this traffic island

has now been propagated and the resulting plants translocated to Mana Island as part of the ecological restoration project for the island (Miskelly 1999).

The nationally threatened *Euphorbia glauca* (sea spurge) has also been brought into cultivation from the one population on the coast of Kapiti Island (Fig. 9). These plants are now used in traffic island and urban plantings along the Petone foreshore. Plants from these collections have also been transferred to Matiu/Somes Island and Mana Island for establishment there as part of the island's ecological restoration programmes (Miskelly 1999; DOC 2001).

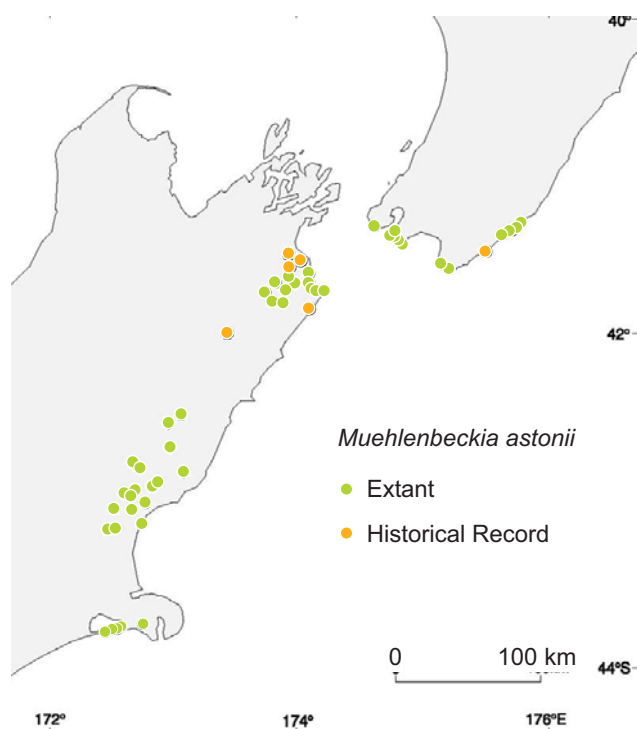


Fig. 7 Natural distribution of *Muehlenbeckia astonii* in New Zealand.



Fig. 8 Turakirae Scientific Reserve — the translocation site for *Muehlenbeckia astonii*.



Fig. 9 *Euphorbia glauca* — a nationally threatened herb found at only one wild site in Wellington.

## CONCLUSIONS

The case studies in this paper demonstrate that we can use our urban environments more effectively by including species that have multiple uses (e.g., threatened plants).

We should think carefully before we revegetate our urban landscapes. What exactly do we want our plantings to achieve? If they are merely to look pretty then use of exotics that are potentially weedy, and may encourage the public to use them similarly, should not be considered as an option.

Our urban plantings are not static and sterile but connected to their surroundings. Exotic plants that may spread and colonise natural areas should not be used. This is also true for plants that will hybridise with natives in the surrounding landscape.

The urban landscape around us is one of the best places to learn about local native plants and how they fit ecologically in the wider environment. The species that we use influences the cultural attitudes of the public towards the environment that they call home. That makes these areas of immense value when considering future biodiversity management.

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