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Regional Pest Plant Management Strategy

May 2007

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CONTACT | **24hr Freephone 0508 800 800** | **help@horizons.govt.nz** | **www.horizons.govt.nz**

SERVICE CENTRES

Kairanga
Cnr Rongotea &
Kairanga-Bunnythorpe Roads
Palmerston North

Marton
Hammond Street
P O Box 289
Marton 4741

Taumarunui
34 Maata Street
P O Box 194
Taumarunui 3943

REGIONAL HOUSES

Palmerston North
11-15 Victoria Avenue
Private Bag 11 025
Manawatu Mail Centre
Palmerston North 4442

T 06 952 2800
F 06 952 2929

Wanganui
181 Guyton Street
P O Box 515
Wanganui Mail Centre
Wanganui 4540

F 06 345 3076

DEPOTS

Dannevirke
Weber Road, P O Box 201
Dannevirke 4942

Levin
11 Bruce Road, P O Box 680
Levin 5540

Pahiatua
Cnr Huxley & Queen Streets
P O Box 44
Pahiatua 4941

Taihape
Torere Road, Ohotu
P O Box 156
Taihape 4742

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FOREWORD

The second review of the Regional Pest Plant Management Strategy has resulted in a substantial change to the document, which reflects the changed nature of our business and a focus on what we will or won't be doing. Having said that, you will be seeing from Horizons Regional Council the business you have been used to around things like biological control, enforcement of boundary clearance, provision of advice and information and importantly, involvement in community-led programmes.

Production values continue to be protected through request-driven enforceable boundary clearance rules. Three additional production pest plant species have been included in the Surveillance Programme so measures can be taken to avoid their introduction into the Region.

The management of environmental pest plants has undergone considerable change, with Horizons increasing our responsibility for the management of these species, both through species-focused region-wide programmes and biodiversity initiatives in high-value sites. The number of environmental pest plant species recognised as a threat to our Region and consequently included in the Strategy has increased.

It is appropriate that resources are channelled towards prevention of future problems, and therefore this Strategy includes a task-bound Surveillance Programme (searching for species not currently in our Region) and time-bound monitoring programme for species which are in our Region already but where we are uncertain on the degree of impact, or level of intervention required from us. Increasing our knowledge around these plants will enable us to make sensible management decisions going forward. Horizons will continue to work with Biosecurity New Zealand in searching for new discoveries of a further nine species.

Community involvement in the review process was high and has influenced the content of this Strategy. Changes that were brought about through the submission process include: the management of tutsan via a boundary clearance rule, the retention of variegated thistle in the strategy with an enforced 50 m setback boundary clearance rule, the removal of three production pest plant species no longer considered to be of considerable concern to the farming community, increased regulation around the removal of contorta pine from the Central Volcanic Plateau and a rationalisation of the Containment objective with the Region's biodiversity programme geared towards the protection of high-value sites.

The cost of implementing this Strategy is an important consideration for the council. Costs are covered through regional rates and land occupier obligations as imposed by this Strategy. The cost of managing environmental pest plants is largely shared across the Region, while the cost of controlling production pest plant species will lie with the beneficiaries and sectors of the community desiring specific outcomes.

We are expecting our community to be able to check us on the following outcomes as we move to implement the ideas expressed in this Regional Pest Plant Management Strategy:

- cost-effective, flexible pest plant management throughout the Region
- minimising of actual and potential adverse effects on production and environmental values
- protection and enhancement of indigenous biodiversity values
- enhanced awareness within the regional community of the many issues of pest plant management.

Michael McCartney
CHIEF EXECUTIVE

Garrick Murfitt
CHAIRMAN

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INTRODUCTION AND BACKGROUND

1. Introduction to Pest Plant Ecology and Pest Plants in the Context of the Manawatu-Wanganui Region

The ecology of pest plants is complex and strategic management of pest plants needs to acknowledge and incorporate such complexities.

Attributes of pest plant species are not consistent between species. Typical attributes of pest plant species include: both long and short distance dispersal, seed set at low populations, asexual reproduction, longevity of seed, high seed production or rapid growth to sexual maturity. Variance in growth form is also exhibited in pest plant species: they can be annual or perennial, erect, ascending, scandent or prostrate. Pest plants can be: mat-forming herbaceous ground covers, shrubs, small, medium or tall trees or any manner of vine (ie stem-projection, semi-climbers, ziz-zag climbers, twiners, hook climbers, root climbers, stem or leaf tendril climbers). This diversity of growth form and reproductive strategy has enabled pest plants to invade every habitat type.

Further, pest plants do not exist in isolation from other pest plants nor from the indigenous flora or exotic and indigenous animal species. Consideration of ecological systems and processes is as important as an understanding of biological characteristics when attempting to manage the pest plant threat. As there is no one 'type' of pest plant, there is no one means of managing them.

Colonialism, journeys of discovery and botanical garden networks saw great quantities of plant material being moved around the world. The result of this 'ecological imperialism' had far reaching consequences, particularly in island nations (Cronk and Fuller, 1995). New Zealand is particularly prone to invasion by exotic species as an oceanic island with definite geological boundaries, a mild climate, a long period of evolutionary isolation, a high level of endemism and limited flora, and a relatively recent history of human settlement.

There are over 20,000 exotic species in New Zealand (Owen, 1997). Of these, approximately 2,000 have naturalised[1] and 300 are listed as pest plants (Department of Conservation, 1998). On average it takes 50 years for bird-dispersed woody species to become naturalised (Sullivan, 2005). Consequently, the future will see a continuation of species becoming naturalised in New Zealand. It is likely that approximately ten percent of naturalised plants will become significant ecological pest plants (Owen, 1997).

The majority of new naturalisations in New Zealand are species that are naturalised overseas, and over half of these species are listed as pest plants elsewhere. Although the attributes of a particular pest plant species may be known from overseas experiences, invasive species can change considerably from parent stock. Environmental factors (including climate change) can act in isolation or combination to alter a species' biological and ecological processes. This plasticity can determine the success or otherwise of a pest plant species and can make predictions of potential impact extremely difficult.

To further complicate the situation, just over a third of the new naturalisations in New Zealand are not recorded as either naturalised species or pest plants overseas. For these species there is no way of knowing how they will behave in New Zealand (Williams and Randall, 2002).

When we combine New Zealand's susceptibility to invasive species, the increase in trade and travel, the ongoing importation of species for the horticultural and agricultural industries, the extremely varied biological characteristics of pest plant species, the complexities of their interactions within a variety of habitats and systems and the number of exotic species already present in New Zealand that will undoubtedly become weedy in future years, it is evident that there is no simple one-off solution.

At a national level, New Zealand has a phenomenal problem. At the regional level, the issue is no less complex. The Manawatu-Wanganui Region is a large region and has a unique and distinctive natural character. The Region includes mountains, hillcountry and lowland, large tracts of forest, forest fragments, wetland, lake and dune habitats. It is supported by large areas of high-value agricultural and horticultural land. The community is distributed between isolated rural areas, small towns and cities. This diversity of landscape, land use and population density is reflected in a diversity of issues that requires a multi-levelled response.

The habitat into which pest plants invade is an important determinant of the success of a species (Cronk and Fuller, 1995). Disturbed and fragmented habitats (as is the reality for much of the New Zealand landscape), low-stature habitats (eg wetlands) and

[1] A naturalised species is one that has formed self-sustaining, persisting populations in the wild.

aquatic systems (eg dune lakes) are particularly prone to invasion by, and degradation from, invasive pest plant species.

Historically, pest plants in the Manawatu-Wanganui Region have been associated with agriculture and horticulture and these were dealt with through the Noxious Plants Act 1978. The Biosecurity Act 1993 increased the scope of pest plant management and in the past decade or so, pest plants of ecological systems and processes have become increasingly recognised.

This Strategy emphasises the importance of an integrated approach towards pest management. It is logistically and financially impossible to conduct widespread pest plant management across the Region. For real gains to be made in biodiversity protection and for the Region's economy to be protected, pest plant control needs to be focused into areas where the most gains can be made. This Strategy provides the framework for pest plant management in the Manawatu-Wanganui Region.

2. INTRODUCTION TO THE REGIONAL PEST PLANT MANAGEMENT STRATEGY

2.1 Title

This document is known as the Horizons Manawatu-Wanganui Regional Pest Plant Management Strategy 2007-2027. It is also referred to as the RPPMS or the Strategy.

2.2 Administrating Agency

The administrating agency for this RPPMS is Horizons Regional Council (Horizons or the council). Horizons is the trading name for the Manawatu-Wanganui Regional Council.

2.3 Purpose of the Strategy

The overriding purpose of the RPPMS is to address and remedy the degradation to production and environmental values caused by invasive pest plant species within the Manawatu-Wanganui Region by providing a regionally, and sometimes inter-regionally, co-ordinated strategic and statutory framework for pest plant management.

This Strategy contributes to biodiversity maintenance as required of Horizons under the Resource Management Act 1991.

2.3.1 Strategy Objectives

The underlying objective of the RPPMS is three-pronged. It will:

- reduce the occurrence of new incursions within the Region (minimising future problems)
- manage infestations of selected pest plant species in selected places (strategic species-led management)
- control pest plant species in specific high-value sites (regionally prioritised site-led management).

In implementing the RPPMS, Horizons shall aim to:

- minimise the actual and potential adverse effects of pest plant infestations on production and environmental values
- protect and enhance indigenous biodiversity
- maximise effectiveness of strategic pest plant management based on a regional perspective.

2.4 Area of Jurisdiction

This Strategy will have effect over the entire Manawatu-Wanganui Region (figure 2.1) as constituted by the Local Government Amendment Act 1992.

The Manawatu-Wanganui Region covers a land area of 22,179 square kilometres in the lower central North Island.

The Region is administered by the Manawatu-Wanganui Regional Council and seven territorial authorities - the Ruapehu, Rangitikei, Wanganui, Manawatu, Tararua and Horowhenua District Councils and the Palmerston North City Council. Small areas of Stratford, Waitomo and Taupo District Councils are also within the Region.

Figure 2.1: Administrative boundaries of the Manawatu-Wanganui Region.

2.5 The Preparation Process

This Strategy was prepared alongside a process of informal public consultation. Consultation during the preparation process was conducted according to the requirements of section 73 of the Biosecurity Act 1993 (the Act). A discussion paper titled 'Regional Plant Pest Management Strategy Review Discussion Paper' was released for public comment in mid-May 2005. The discussion paper was mailed directly to key stakeholders (eg interest groups, iwi, garden centres and plant retailers, environmental and resource agencies) and made available to the public upon request. The discussion paper was available on the Horizons web page[2] and responses could be submitted on line.

Horizons received 34 responses to the discussion paper through the custom-designed freepost feedback form and a further 11 responses by email or telephone. Workshops were held with ten key stakeholder groups.

As a component of the consultation process, nominations were received for plant species to be included in the proposed Strategy. A freepost Pest Plant Nomination Form was distributed and made available to the public upon request. Over 70 nominations were received.

A timeline of the key steps taken in the Strategy review process is outlined below.

Table 2.1: Timeline of the key steps in the strategy review process.

Date	Key Step
December 2004	Internal review of existing Strategy complete.
Mid-March 2005	Initial mail-out to existing database of 80 interested members of public informing them that the Strategy review had commenced and advising of the consultation process. A copy of the Pest Plant Nomination Form was enclosed in this mail-out.
Mid-March 2005	Initial mail-out to 126 stakeholders and 100 garden centres/plant retailers informing them that the Strategy review had commenced and advising of the consultation process.
End-March 2005	Initial mail-out to 88 iwi representatives informing them that the Strategy review had commenced and advising of the consultation process.
Mid-May 2005	Review discussion paper mailed to key stakeholders, garden centres/plant retailers, iwi representatives and made available for general public release. Approximately 500 copies of the discussion paper were circulated.
Mid-May - End June 2005	Workshops held with various key stakeholders upon request.
Early June 2005	Press releases and articles in Across the Region (the Regional Council's newsletter) further alerted the public to the Strategy review and consultation process.
End July 2005	Responses to discussion paper and workshops summarised and circulated to respondents. Detailed summary of feedback available on Horizons web page.
Early February 2006	Further workshops held with key stakeholders.
Early October 2006	Proposed RPPMS publicly notified.
Mid-November 2006	Submission period closed.
Mid-December 2006	Hearings of submissions held. Deliberations commenced.

[2] www.horizons.govt.nz

2.6 Document Structure

This Strategy is based upon requirements for a Regional Pest Plant Management Strategy as outlined in the Biosecurity Act 1993.

Part One: Introduction and Background

Part One contains introductory and background information that will assist the reader's understanding of the development of the Strategy. Part One has been divided into the following sections.

- Section 1 introduces pest plant ecology in the context of the Manawatu-Wanganui Region.
- Section 2 contains the introduction to the Strategy and states: the title; administrating agency; purpose and objectives; the area of jurisdiction; and outlines the review process and the structure of the Strategy.
- Section 3 describes the statutory framework within which the Strategy sits, including the relationship with other statutes and policy, and outlines some of the effects implementation of the Strategy may have.
- Section 4 covers the planning framework on which the Strategy is based and includes the key principles of the Strategy and the rationale and theory driving management decisions for each pest plant or group of pest plants.
- Section 5 outlines the strategy responsibilities and obligations of both Horizons and occupiers under the Strategy.

Part Two: Pest Plant Management Programmes

Part Two has been divided into three sections:

- Section 6 provides an introduction to the pest plant management programmes, a definition of the management method objectives, and the agencies responsible for control. This section also provides an explanation of the implementation of the Strategy objectives, including the provision of advice and information, an explanation of the Strategy rules and the compliance process. Methods for monitoring and reporting on the Strategy objectives are also outlined.
- Sections 7 (production pest plants) and 8 (environmental pest plants) contain information specific to each plant listed in the Strategy. This includes: the actual or potential impact of the pest plant; the need to intervene; the objectives, means of achievement, and the management regime and relevant rules.

Part Three: Other Management Programmes and Initiatives

- Section 9 (surveillance) outlines the objectives and implementation methods for the surveillance programme. A list of species in this programme is provided.
- Section 10 (site-led) outlines the approach and objectives for the site-led programme and includes a comprehensive list of pest plant species that will be targeted only in site-led management.
- Sections 11 (National Pest Plant Accord) and 12 (Small-scale Management) detail Horizons' responsibilities, methods of action and powers under these two initiatives.
- Section 13 describes Horizons' biological control programme.
- Section 14 outlines directions for research and training.
- Section 15 details methods and targets for awareness campaigns and initiatives.
- Section 16 describes Horizons' approach for working with community groups.
- Section 17 deals with cross-boundary issues.

Part Four: Administrative and Management Procedures

Part Four is divided into four sections dealing with administrative and management procedures as prescribed by the Biosecurity Act 1993.

- Section 18 outlines the statutory powers held by Horizons Regional Council.
- Section 19 describes the regulatory management of the Strategy including: the consequences of failing to comply with a rule or notice of direction; methods for recovery of costs incurred; and the provision of exemptions to a rule.
- Section 20 outlines the funding of the Strategy including: the costs of the Strategy; sources of funding; cost recovery and compensation.
- Section 21 describes the Strategy review procedures.

3. STATUTORY FRAMEWORK

3.1 Legislative Framework

The Biosecurity Act (the Act) enacted on 1 October 1993 reformed pest management in New Zealand, replacing the Noxious Plants Act 1978. The Act has two underlying principles:

1. Prevention of harmful organisms (plants, animals and diseases) from arriving in New Zealand (pre-border and border inspections and controls).
2. Management of harmful organisms already in New Zealand by implementation of national and regional pest management strategies, and small-scale control measures for 'unwanted organisms'.

Section 13 of the Act empowers Horizons to have a significant statutory role in implementing the Act, but no statutory obligation. Horizons has chosen to be proactive and recognise its ongoing responsibilities for pest plant management by having a strategy continuously in place.

In preparing this Strategy, Horizons has taken into account the Act and subsequent legislative amendments to the Act. This Strategy has been considered, planned and funded pursuant to Part V of the Act.

3.2 Relationship with other Statutes

While the Act is the cornerstone for any pest management strategy, there are other Acts and regulations that this Strategy must have regard to. Nothing in this Strategy is to affect or derogate from other legislation relating to pest management. This includes those Acts as specified in section 7 of the Biosecurity Act 1993:

- Soil Conservation and Rivers Control Act 1941
- Forests Act 1949
- Wildlife Act 1953
- Health Act 1956
- Animals Protection Act 1960
- Customs Act 1966
- Wild Animal Control Act 1977
- Reserves Act 1977
- National Parks Act 1980
- Fisheries Act 1983
- Conservation Act 1987
- Trade in Endangered Species Act 1989
- Resource Management Act 1991 (and amendments).

The provisions of the Act as they relate to risk goods shall not be construed to take precedence over:

- Customs Act 1966
- Misuse of Drugs Act 1975.

Other legislation that the Strategy must have regard to includes:

- Local Government Act 1974 (and amendments)
- Rating Powers Act 1988
- Health and Safety in Employment Act 1992
- Hazardous Substances and New Organisms Act 1996.

3.3 Relationship with other Policy

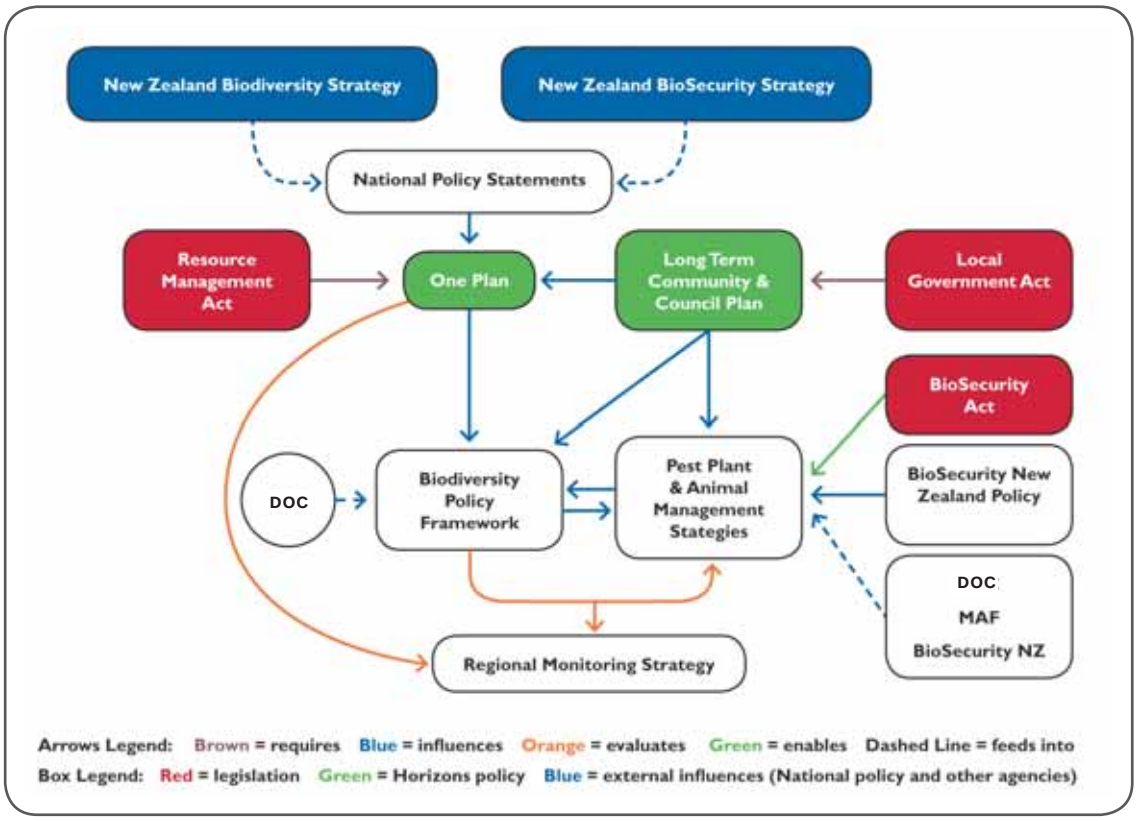


Figure 3.1: Diagrammatic representation of linkages between legislation, strategies and other policy.

3.3.1 The New Zealand Biosecurity Strategy

The need for the New Zealand Biosecurity Strategy (NZBSS) was identified and funded under the New Zealand Biodiversity Strategy (section 3.3.2) and came into being in 2003. The focus of the NZBSS is on pre-border, border and post-border activities to keep out new pests. The Strategy has addressed the role of the Crown in maintaining and monitoring the national framework for pest management.

It has been identified within the NZBSS that New Zealand currently lacks strong national leadership in the biosecurity arena. The NZBSS provides little on implementation but it does provide a set of explicit expectations. The expectations for pest management in the future under the NZBSS are:

- that there is a clear and effective national leadership and coordination of pest management activities within central government, local government and the private sector
- that there are transparent and effective performance measures to monitor and forecast the establishment of pest and weed impacts and pathways
- that the Crown meets its obligation as a landowner
- that there is a routine programme of national and regional communication and coordination including ongoing assessment and review of both individual programmes and the overall system.

Although currently the NZBSS has little influence on the structure or content of a RPPMS, it provides clear expectations for the future directions of pest management and emphasises the importance of a collective approach by agencies, industry and individuals. Over the forthcoming years obligations and roles of the various agencies will become apparent. The newly branded Biosecurity New Zealand is the leading agency in biosecurity management at the national level.

3.3.2 The New Zealand Biodiversity Strategy

The New Zealand Biodiversity Strategy (NZBDS) came into being in February 2000 and is coordinated by the Department of Conservation. The NZBDS outlines the actions taken to implement New Zealand's requirements under the Convention on Biological Diversity (CBD) that was ratified by the New Zealand Government in 1993. The CBD was one of the key agreements arising from the Earth Summit in Rio de Janeiro (1992).

The term 'biodiversity' relates to the variety of biological life and the natural patterns it forms - that is, genetic diversity, species diversity and habitat diversity. The NZBDS states that maintenance and enhancement of land-based indigenous biodiversity is under greatest threat from invasive species. Therefore biodiversity and biosecurity are intertwined - a positive outcome for one is a positive outcome for the other.

Both the existence of Horizons RPPMS in general, and the site-led focus on environmental pest plants in particular, follow on from the scope and issues highlighted in the NZBDS which in turn addressed New Zealand's responsibilities in the international context.

3.3.3 Department of Conservation Policy and Strategy

The Department of Conservation (DOC) manages eight million hectares of publicly owned land across New Zealand. There is 423,777 ha of public conservation land within the Manawatu-Wanganui Region managed under five conservancies.

The Department is responsible for preserving and protecting these areas, including the management of pest plants (Department of Conservation, 1998). Under the Resource Management Act 1991 regional councils have a similar mandate to maintain biodiversity on private land.

The control of pest plants on public conservation land (managed by DOC) and on private land (managed by regional councils) is intertwined. Therefore, it is advantageous if this Strategy complements where possible the intentions of DOC's Strategic Plan for Managing Invasive Weeds. Likewise, there are benefits to both agencies and the greater community if DOC incorporates the requirements of this Strategy into its relevant work plan priorities.

The goal arising from DOC's Strategic Plan for Managing Invasive Weeds is:

"The integrity and sustainability of all natural areas that are important for natural heritage conservation, and the long-term survival of native species, are maintained or improved" (Owen, 1998).

3.3.4 Horizons Regional Animal Pest Management Strategy

For effective long-term management of either pest animals or pest plants an integrated approach is essential. Pest animals are often vectors of pest plants. Dominance of pest plant species can favour exotic fauna. Removal of pest plants in isolation from pest animals could result in a diet switch to the further detriment of the indigenous flora. Alternatively, removal of a single pest animal could benefit one or more species of pest plants or pest animals that could in turn have a detrimental effect on indigenous biodiversity.

The framework and approach laid down in this Strategy will be followed and complemented by the review of Horizons Regional Pest Animal Management Strategy in due course.

3.3.5 The ONE PLAN

The ONE PLAN (in draft) will be a combined Regional Policy Statement and Regional Plan dealing with matters that Horizons is responsible for under the Resource Management Act (RMA) 1991. The ONE PLAN will have eight themes:

1. Issues Significant to Iwi
2. Land
3. Water
4. Living Heritage (biological diversity, landscapes and natural features)
5. Air Quality
6. Coastal Environment
7. Natural Hazards
8. Waste and Contaminated Sites.

In keeping with the RMA's general principles, the ONE PLAN policies and regulations will seek to protect landscape, ecosystems and heritage.

The ONE PLAN further consolidates the importance of an integrated approach to natural resource management. This Strategy provides a crucial tool in achieving the indigenous biodiversity goals outlined in the ONE PLAN under the mandate provided by the RMA.

3.3.6 Neighbouring Regional Pest Management Strategies

Horizons shares boundaries with Greater Wellington (the Regional Council), Taranaki Regional Council, Environment Waikato and Hawke's Bay Regional Council. It is in the interests of efficient and effective pest management to have regard to the Regional Pest Management Strategies of our respective neighbouring councils.

3.4 Effects of Strategy Implementation

Horizons, given its experiences under the current Strategy, is satisfied that the overall effects of this Strategy will be beneficial. The successful implementation of the Strategy will contribute to the long-term control (of some species) and management (of most species) of pest plants in the Manawatu-Wanganui Region.

While Horizons is confident that the existence of a Strategy is the most effective way of managing pest plants, there are some aspects of the Strategy that may have real or perceived adverse effects. These issues largely centre around the use of herbicide which can cause some public disquiet, and the control of certain pest plant species causing diet shift in mammalian herbivores.

The employment of best practice methods when applying herbicide and a greater emphasis on integrated habitat management will address these concerns.

3.4.1 Effects on Maori Values

The impact of pest plant species on natural areas and waterways is detrimental to values important to tangata whenua. Pest plant management under this Strategy will have a positive effect by contributing to the protection of taonga plant species (treasured plants), mauri (life force), waahi tapu, and to the tikanga values associated with indigenous biodiversity, landscapes and waterways. Positive results stemming from this Strategy include improved access to traditional food gathering sites (eg wetlands and estuaries), and improved quality of plant species for food, fibre and rongoa (Maori medicinal) uses. The Strategy will reduce risks to species of Maori cultural significance (eg pingao, harakeke) and to their associated habitats.

3.4.2 Effects on the Environment

This Strategy will enhance and protect the ecological environment including natural ecosystems and processes, soil health and water quality by removing, reducing or managing the pest plant species that threaten them.

Enjoyment of the cultural environment will also be enhanced where pest plant management overlaps with amenity and recreational values.

The economic environment will experience some positive impact with the reduction of production pest plants (those that impact on pasture or are toxic to stock) as a result of use of biocontrol agents and through assistance in maintenance of clean land. In addition, the tourism industry (domestic and international) will enjoy positive effects from this Strategy through enhancement of the natural areas utilised by visitors.

3.4.3 Effects on Marketing of New Zealand Products Overseas

The control of pest plants in areas of high natural value should increase the recreational and aesthetic values associated with these areas, which will have a positive impact on international tourism. Further, New Zealand's clean, green image may benefit from pest plant management in natural areas. Conversely, the broad-scale use of herbicide could be considered in conflict with this image.

4. PLANNING FRAMEWORK

4.1 Key Principles of the Strategy

The key principles focus and guide the direction of the Strategy (table 4.1).

Table 4.1: The key principles of the Regional Pest Plant Management Strategy for the Manawatu-Wanganui Region.

SURVEILLANCE	Horizons will undertake and fund a region-wide surveillance programme to search for and control new incursions that pose a threat to production and natural areas in the Manawatu-Wanganui Region. Relationships with plant retailers will be maintained as most environmental pest plant species originate from private gardens. Explanation: Prevention is the most economic and practically feasible method by which to protect our Region from invasive pest plant species. Having the funding to take action should an infestation be discovered is fundamental to the success of any surveillance programme.
"EASY WINS" QUICK ACTION ON NEW THREATS	In the instance of low-incidence, high environmental threat pest plant species Horizons will carry out control with the aim of achieving Zero-density. Explanation: Maintaining zero density of such species can be achieved within a Region-wide, focused framework. In some instances Horizons will have the best technical skills required in either identification or control of the pest plant species.
BOUNDARY CONTROL	Production pest plant species will largely be managed through a boundary control regime and enforcement will be request driven. Efforts to maintain clean land should be recognised and regulations enforcing boundary clearance will be adhered to. Explanation: It is not economic to patrol all the boundaries within the Manawatu-Wanganui Region. Control of production pest plant species will be driven by on-farm economics and self-motivated control will directly benefit the occupier. It is recognised that regulation may need to be employed in some instances to protect neighbouring properties.
HABITAT PROTECTION/SITE-LED WORK	Emphasis will be placed on environmental pest plants and the habitats vulnerable to these plants. Pest plant management will sit alongside other habitat management techniques and be an important component of integrated site-led management. Explanation: The adhoc removal of a single species in isolation will not necessarily result in the protection or enhancement of natural areas. A holistic targeted approach to management of high-value sites and habitats will have greater benefit.
INTERAGENCY RELATIONSHIPS	Relationships will be maintained between neighbouring regional councils, territorial local authorities, Government departments and Crown entities and other agencies. Interagency partnerships will be encouraged. Explanation: Co-operation between agencies will increase Horizons' ability to prevent new species from establishing in the Region. Sharing of knowledge, technical skills and focussing on combined benefit (eg biocontrol) will lead to more cost-effective and efficient pest plant management.

MONITORING AND REPORTING	Horizons will undertake structured monitoring and reporting on all activities pertaining to this Strategy to ensure efficient achievement of desired outcomes. Explanation: Horizons will have a culture of continuous improvement.
EDUCATION AND AWARENESS CAMPAIGNS	Emphasis will be placed on education aimed at increasing awareness and promoting behaviour change within the community. The focus will be on providing the necessary information and assistance to enable the community to identify problems and to carry out their own pest management. Certain high-risk dispersal avenues and activities will be identified and targeted for focused awareness campaigns. Explanation: Education to increase awareness and promote behaviour change within the community is vital as humans are a major vector of pest plant dispersal. Awareness of the issues involved in pest plant management will contribute to community ownership of such issues.
COMMUNITY PARTICIPATION	Horizons will establish and nurture community 'adoption' of rationally chosen natural areas. Horizons will assist with management plans and seeding funds where appropriate. Explanation: Facilitating community involvement is fundamental to achieving long-term pest plant management throughout the Region.
RESEARCH AND BIOCONTROL	Horizons will support or undertake research and training to contribute to the existing collective knowledge. Carefully considered biological control will be one focus of research efforts. Explanation: National and international understanding of invasive species ecology is increasing and evolving all the time. It is imperative that Horizons provides the means for its staff to keep informed with such developments and abreast of changing management practices. Biological control can make considerable inroads in the management of widespread high impact pest plant species.
FUNDING	The control of environmental pest plants will be community funded. Costs associated with production pest plants will be the responsibility of the occupier. Control of environmental pest plant species is for the benefit of the whole community and is therefore funded as such. Explanation: In terms of production pest plants, landowners are exacerbators and beneficiaries, and therefore will meet the costs incurred for control on their land. The costs of surveillance programmes (both environmental and production pest plants) will be met by the community.

4.2 Assigning the Management Objective

A combination of tools has been used to determine which management objective to assign to which pest plant. An initial rigorous biological assessment process was conducted to determine the level of threat ('Weediness' score, aquatic species rankings). The cost benefit analysis (CBA) contributed to ensuring the benefits outweighed the costs. The plant rankings and the CBA were considered together to determine the practicality of controlling the individual pest plants (Practicality score). Two pest plant population dynamic models (the Infestation Curve and the Core-Satellite Models) were also incorporated into the assessment process. All these tools combine to give a clear picture of how best to manage individual pest plant species.

4.2.1 Threat Assessment of Pest Plant Species included in the Strategy

The pest plants included within this Strategy are an amalgamation of those from the current Strategy and newly identified species. A comprehensive investigation was undertaken to identify all possible species that are of threat to the Region's productive agricultural land or the natural environment. This investigation was undertaken by comparing all currently known adventive plant species within the Region (Ogle, 2005; Singers, 2005 and DOC Bioweb weeds database), with whether they were proven invasive pest plants in New Zealand or internationally. Some species were recognised as a result of the initial submission process. New species chosen for the Strategy are either absent, rare or restricted in distribution within the Manawatu-Wanganui Region. Management to mitigate their impacts is therefore likely to be successful and cost-efficient.

A number of risk assessment processes or official designations were used for assessing whether a species is of threat to the Region. Significant weight was placed on species that have been designated as "unwanted organisms"[3], which include many of the current and potential worst pest plants in New Zealand.

Two main risk assessment processes were used to assess threat: the 'weediness' score (Department of Conservation) and one specifically for aquatic and wetland weeds (Champion and Clayton, 2001). Not all species have been assessed by these risk assessment processes or are unwanted organisms. A few species only recently identified as being invasive in the Region were included, on the basis of a known weed history internationally or elsewhere in New Zealand, or on the basis of recent observations within the Region.

Candidate species were placed into the main habitat type they impacted on for the purposes of assessment. The habitat types included:

- wetlands, streams and lake edges
- aquatic
- forest, scrub and forest margins
- coastal dunes and cliffs
- tussock and alpine
- agricultural production land.

Attributes and information considered during the threat assessment included:

- common and binomial classification name
- position on Infestation Curve
- 'weediness' score (0-36, the greater the number the greater the threat)
- aquatic species ranking (0-100, the greater the number the greater the threat)
- practicality score (0-10, the greater the number the more practical)
- Unwanted Organism status
- status of the species overseas
- status of the species as a transformer species within New Zealand (a species that is capable of completely modifying the habitat it invades making it unsuitable for virtually all other species that formerly occupied it)
- indication of whether the species is already present in the Region or neighbouring regions
- any further information regarding impacts and distribution of the species.

A detailed description of the assessment process and the workings for each species can be found in the Strategy supporting document.

[3] Organisms that have been determined unwanted by chief technical officers of government departments with biosecurity interests. The register also contains organisms declined importation by the Environmental Risk Management Authority (ERMA NZ) and organisms listed in the second schedule of the Hazardous Substances and New Organisms Act 1996.

4.2.2 Infestation Curve Model

The Infestation Curve (figure 4.1) is a simple model that illustrates basic pest plant population dynamics. Where a particular species sits on the infestation curve has been derived from distribution maps and field knowledge regarding geographical spread and population densities. The position on the Infestation Curve helped to determine the management objective for individual pest plants.

Surveillance pest plants will generally sit off the Infestation Curve Model as they are not yet present in the Region. The lower (< 4) the pest plant is placed on the Infestation Curve the higher the likelihood of achieving control (Zero-density management objective). Those widespread pests (5-8 on the infestation curve) will be more successfully and cost-effectively managed under a Containment management objective. Environmental pest plants to be managed under the Site-led programme generally all sit in the upper end of the curve.

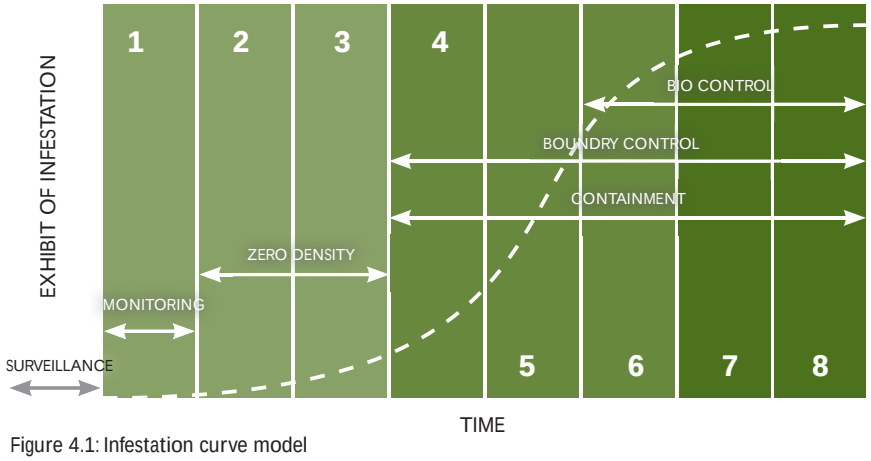


Figure 4.1: Infestation curve model

The Infestation Curve has been described in Kormondy (1969) and Panetta (1994).

Table 4.2: Infestation curve category descriptions.

	Description
1	Not yet in Region but known nearby.
2	1 or 2 known sites. Effects may be unknown.
3	3-20 sites. Effects may be unknown.
4	Between 20 and 30 sites but still limited in extent.
5	Restricted range but starting to noticeably expand its range and/or intensity of infestation.
6	Widespread and continuing to expand range and/or intensity of infestation.
7	Common throughout most of the expected habitat in the Region.
8	Widespread through all suitable habitat.

- Lag Phase: Categories 1-3
- Explosion Phase: Categories 4-6
- Established Phase: Categories 7-8

4.2.3 Core Satellite Model

Pest plants often establish a core infestation with smaller surrounding satellite infestations (figure 4.2). It is strategic to control the smaller satellite infestations to limit further spread of the plant before controlling the established larger core infestation. This theory lends itself to containment areas.

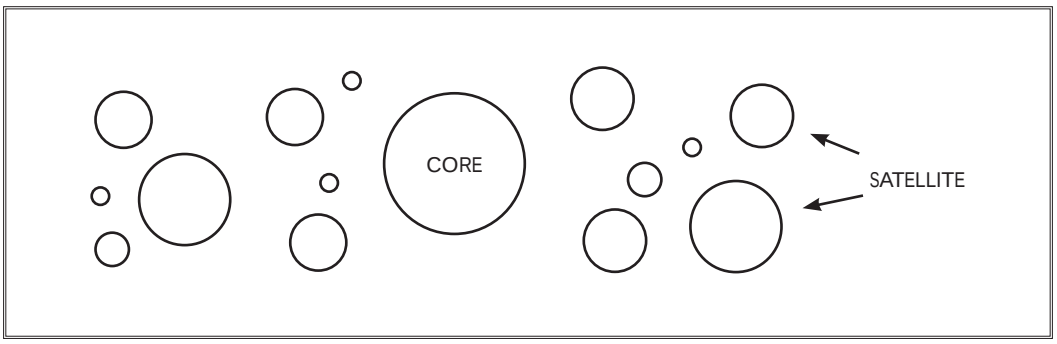


Figure 4.2: The Core Satellite model.

4.3 Site-led versus Species-led Management

The reasons why we are undertaking management and what we are trying to protect leads to either a species-led or site-led approach. Species-led programmes are proactive, concentrating on a specific species throughout the Region and what is required to control or restrict that species to minimise future threat. Site-led programmes focus on protecting certain values at certain sites. Therefore the focus is not on individual species but on the site, the values within the site and the threats to those values.

The Act's approach to pest management is focused on pest species and involves naming species as pests over all or part of the Region and putting in place methods and rules by which to manage them. This type of pest management is known as 'species-led'.

The species-led approach best suits species that are still at low population densities and/or restricted distribution and still within a lag phase (low on the infestation curve). Under this Strategy species listed under Part Two are for the most part managed under a species-led approach. The exception being that species under a Containment management method can be both species-led and site-led. That is, species-led outside the Containment Area (where that plant occurs it will be controlled) and site-led within the Containment Area (the species will only be controlled within high value sites as a component of integrated site management).

The site-led approach is not limited by species, nor population densities and distribution of pest plant species. Pest plant species included in a site-led approach are typically widespread, but can also include species of limited distribution that pose a threat to the site in question. Sites can vary in scale and can encompass buffer zones and areas of dispersal risk.

Part Two of this Strategy lists pest plant species under a species-led management regime. Site-led programmes are addressed in section 10.

Table 4.3: Comparison between species-led and site-led approaches of pest plant management.

	Species-Led Approach	Site-Led Approach
Focus:	Control or management of a specific species.	Protection of specific values at specific sites.
Type of Species:	Pest plant species at low-density, or restricted distribution, high-risk species.	Mostly widespread, high-density pest plant species, but can also include species at low density and/or distribution. Situations where control of one species alone is not enough to protect natural values.
Scale:	The focus of a species-led approach is the entire Region, although the actual area of control can be smaller.	Depends on the values and area to be protected. Can be a collection of sites or include areas that buffer against seed sources and dispersal.
Outcomes:	The absence or restricted distribution of the pest plant species in question (threat of species removed).	Positive changes in the health and ecological integrity of the values within sites (enhanced indigenous biodiversity).
Driven By:	The Biosecurity Act 1993	The Resource Management Act 1991.

5. STRATEGY RESPONSIBILITIES AND OBLIGATIONS

5.1 Horizons Regional Council

Horizons is the management agency responsible for the implementation and administration of this Strategy. As the management agency, Horizons will be accountable to stakeholders and ratepayers who fund the Strategy and undertake the programmes outlined in this Strategy by:

- providing technical advice and information on pest plant management
- enforcing strategy rules
- conducting surveillance for new incursions, and ensuring species banned from sale, propagation and distribution are not offered for sale
- encouraging community initiatives
- implementing focused advocacy and awareness campaigns with a view to behaviour change within the community
- incorporating new research and developments into work plans including the continued use of biological control agents
- continual training of staff including plant identification, new control methods and monitoring and information recording techniques, attendance at training seminars and workshops
- conducting direct control of pest plant species (including small-scale control under section 100 of the Act).

5.2 Iwi

Horizons will consult with iwi/hapu on matters relating to pest plant management, and in particular where they impact on Maori land. Such consultation is not intended to replicate consultation undertaken by other agencies (eg Landcare Research in regards to the introduction of biocontrol agents). Horizons will work towards improving protocols for engagement with iwi/hapu to improve interaction and levels of consultation.

5.3 Stakeholders

For the purposes of this Strategy, stakeholders are those persons who either benefit from the Strategy's implementation, or exacerbate pest plant problems, and accordingly will be bound by the provisions of the Strategy and will contribute to its funding. Ratepayers, Crown departments, State-owned enterprises and other Crown occupiers fall under this stakeholder definition.

5.3.1 Private Occupiers

Occupiers of private land are required to control pest plants on land that they are responsible for, as set out in any rule prescribed in Part Two (Pest Plant Management Programmes) of this Strategy. Private occupiers will contribute to funding implementation and administration of the Strategy in accordance with the funding provisions set out in section 20 of the Strategy. This applies only to land for which rates are assessed and collected. Non-rated land occupiers will fund pest control themselves. Further, a contribution to the administration and other costs of the RPPMS can be negotiated, if the non-rated land occupier agrees to be bound by the Strategy.

The regional council may, in accordance with section 19.5 of this Strategy, exempt any person from any specified requirement included in a rule.

5.3.2 Crown Agencies

Five central government agencies occupying the Crown estate have been identified as being significant beneficiaries or exacerbators of pest plant management in the Region.

Crown agencies and entities are required to control pest plants on land that they administer on behalf of the Crown, as set out in rules prescribed in Part Two of the Strategy. Pursuant to Section 87 of the Act, the Crown cannot be bound to, or fund the Strategy, unless it agrees by Order in Council.

Horizons proposes that Crown Agencies be bound by the Strategy. This is subject to obtaining an Order in Council.

Horizons will continue to lobby the Crown for funding and continue to pursue memoranda of understanding and partnerships with Crown agencies and entities as required.

Department of Conservation

The Department of Conservation (DOC) administers 423,777 ha (c. 19% of the total land area) in the Manawatu-Wanganui Region. It is a land occupier for the nation's estate under the Reserves Act 1977, National Parks Act 1980, and the Conservation Act 1987.

There are five conservancies with part of their area within the Horizons boundary (Wellington, East Coast/Hawke's Bay, Waikato, Tongariro/Taupo and Wanganui Conservancies). DOC has particular interest and expertise in the area of environmental pest plants and their threat to indigenous biodiversity values.

Memoranda of understanding will be pursued with DOC to achieve indigenous biodiversity outcomes, and to enable work outside of the Strategy responsibilities.

Land Information New Zealand

Land Information New Zealand (LINZ) administers approximately 1,280 ha of vacant and non-rateable[4] land. LINZ also has responsibility for unalienated Crown land in the Region and surplus railway land.

New Zealand Railways Corporation and their lessee On Track

New Zealand Railways Corporation (NZRC) is the Crown agency responsible for the rail corridor and associated lands. The NZRC is not the occupier of the rail corridor, as that land has been leased to On Track.

On Track is a public company responsible for 522 km of railway line in the Manawatu-Wanganui Region, accounting for around 1,600 ha of non-surplus railway land. The responsibility for surplus railway land lies with Land Information New Zealand.

New Zealand Defence Force

The New Zealand Defence Force (NZDF) have three large installations within our Region. They are the Ohakea Air Force Base, the Linton Army Camp and the Waiouru Army Camp and surrounding training area. The total area occupied is approximately 62,000 ha.

Horizons will continue to work in partnership with the NZDF occupying the Waiouru training area to manage pest plants on the volcanic plateau. memoranda of understanding will ensure the operational programmes of the two agencies continue to complement each other. The NZDF funds its own pest plant control programmes.

Transit New Zealand

Transit New Zealand is the roading authority for state highways. Transit New Zealand falls within the definition of occupier for the purposes of the Act. Transit New Zealand has obligations for pest control as an occupier.

5.3.3 Territorial Local Authorities

There are seven territorial local authorities (TLAs) within the Region. District and city councils occupy land and are roading authorities in their localities. District and city councils are required to carry out pest plant management pursuant to any Strategy rule on land, including roadside verges, which they occupy and administer.

[4] Under the First Schedule of the Rating Powers Act, the Crown does not pay rates. Consequently, the Crown may agree to contribute monies in lieu of rates to fund this Strategy.

5.4 Transport Corridor Responsibilities

Road reserves include the land on which the formed land lies and the verge area that extends to adjacent property boundaries. Roading authorities (Transit New Zealand and district or city councils) are both exacerbators (as occupiers) and beneficiaries (as pest plants can interfere with roading operations) from pest plant control.

On Track (as the current occupier of the rail corridor) is also both an exacerbator and beneficiary of pest plant control. On Track, as a Crown agency, cannot be bound by this Strategy unless it chooses to be. Horizons will work with the occupier of the rail corridor to reach an agreement of responsibility for pest plant control in accordance with this Strategy.

It is consistent with the principles of the Act for roading authorities to be fully responsible for pest plant control on land they occupy and manage. An RPPMS may transfer responsibility for pest plant management of road reserves to the adjacent occupier, or have a mix of responsibilities. Horizons has chosen to implement the latter option with responsibility falling largely with roading authorities as outlined below.

Roading Authorities' Responsibilities

In accordance with sections 6 and 76(1)(i) of the Act, roading authorities are responsible for controlling pest plants (as described in Part Two of this Strategy) on road reserves that they occupy in the following situations:

- rest areas
- weigh pits and stockpile areas
- road reserves where road works have contributed to the establishment of named pest plants
- other isolated areas of road reserves mainly for safety reasons
- road reserves adjacent to land where the landowner is undertaking programmed pest plant management
- any other area where it is unreasonable to expect adjoining landowners to control pest plants (eg steep topography).

Interpretation of Roading Authorities' Responsibilities

- Pest plants with a Boundary Control or Containment management objective under this Strategy will require control where they occupy road reserves. In the case of pest plants under Containment objective, control will be enforced by a rule outside of the Containment Area only.
- Enforcement of pest plant clearance in road reserves will be in accordance with Part Two of the Strategy.
- Where the road reserve boundary is unknown it shall be taken as 10 m from the road centre line.
- The control of pest plants on unformed (paper) roads remains the responsibility of the person physically occupying that land. Where an unformed road is a public road, and a physical occupier cannot be determined, the roading authority has the responsibility for pest plant control.
- Where fences encroach into a surveyed road reserve, the occupier adjoining the road reserve shall be responsible for pest plant control.
- In situations where adjacent occupiers do not support the use of chemicals to control pests (eg organic farming practices), it will be sufficient for roading authorities to mechanically trim or mow for initial control, after which the adjoining occupier shall be responsible for maintaining control of the pest plants to the standard required for the duration of the Strategy.

Memoranda of understanding between Horizons and roading authorities will be sought. Such agreements should:

- state which species are to be controlled, and where, and best practice control methods suggested
- state expected timeframes for completion of work
- incorporate existing agreements between roading authorities and their clients (ratepayers), eg non-spray agreements
- encourage machine hygiene.

PART TWO

PEST PLANT MANAGEMENT PROGRAMMES

6. INTRODUCTION TO THE PEST PLANT MANAGEMENT PROGRAMMES

Horizons has adopted a different approach for the rural and urban landscapes. The pest plants that threaten production land are largely different from those plants that pose a threat to natural areas. For the most part, pest plant management in the rural landscape is addressed under the scope of the Production Pest Plant Programme. Control of production pest plants is primarily the responsibility of the landowner.

The urban landscape is diverse. Pest plant problems reflect this diversity and are compounded by social issues. Additionally, properties are harder to inspect and areas of 'waste space', council and community plantings and road verges can serve as breeding grounds for weeds. Absentee landowners and rental accommodation also can make occupier responsibilities less clear-cut. The approach for urban areas will be focused on awareness campaigns, self-responsibility and behaviour change.

Each programme has a hierarchy of one or more objectives and a variety of methods and tools. This hierarchical structure is illustrated in figure 6.1.

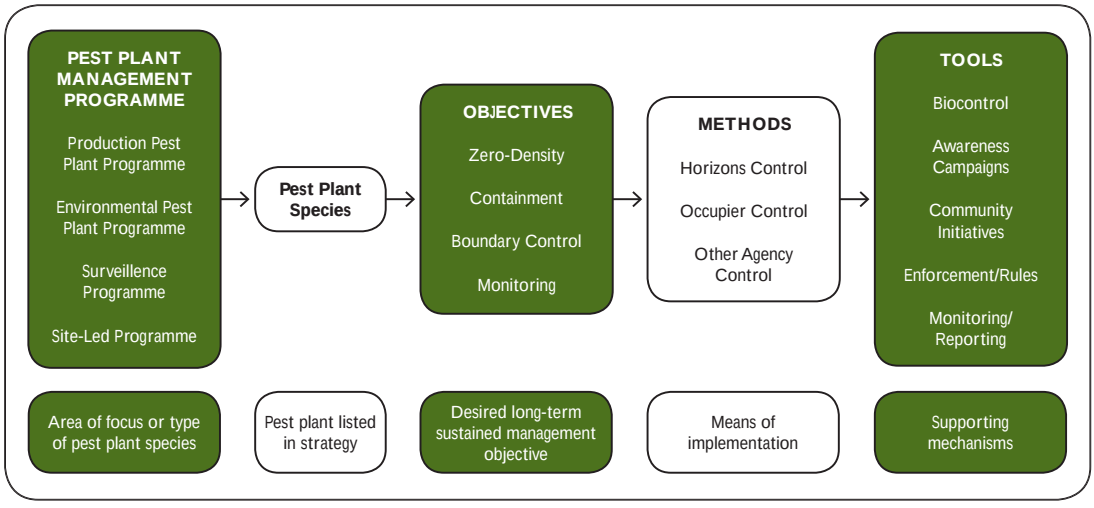


Figure 6.1: Management regime hierarchy.

A pest plant may have more than one objective and any number of methods and tools contributing to the management regime of that particular plant.

6.1 Definition of Pest Plant Management Programme Objectives

The variability of biology, distribution of infestation and extent of infestation of pest plant species across the Region requires management techniques that reflect that variability. Pest plant management can be a continuum from possible eradication (Zero-density), reducing range and density and restricting current range (Containment), through to focussing on certain areas only (Site-led).

Many species are widespread across the Region and present in high densities. For such species, it is acknowledged that although the plants are undesirable, large-scale control programmes are not economically feasible or practically achievable. In such cases, alternative objectives are required. Preventing further spread is one such option. Hard decisions need to be made to ensure limited resources are used to achieve maximum success on a Region-wide basis.

The lasting permanence of many pest plant species is a harsh reality. In many areas across the Region we will have to accept the continued presence of these species. However, in areas of high natural value, the presence of pest plant species is not acceptable and such areas will be prioritised for control (section 10).

Table 6.1: Definition of objectives of the pest plant management programmes.

ZERO-DENSITY	All infestations will be controlled to Zero-density as and when they are found. Zero-Density means the control of the pest plant to the last individual (thus allowing for the reality of re-infestation via the seed-bank or seed-rain). Pest plant species that are limited in distribution will fall under this objective. Although the majority of operations under the Zero-density objective will sit with Horizons, this responsibility is not exclusively that of Horizons. In some instances, other parties will be responsible for achieving this objective.
CONTAINMENT	Where population levels or difficulty and expense of control prevent achieving a Zero-density objective, high-threat pest plant species will be managed under a Containment objective. For each species managed by Containment, a Control Area is defined (and mapped). Within the Control Area the pest plant species will be controlled wherever it is found. Control Areas are determined by infestation size and are limited by budget. The focus of control is placed where infestations are low or where the pest plant in question poses a high risk. The remainder of the Region, not included in a Control Area, is defined as a Containment Area. Within the Containment Area no widespread control of the species in question will be undertaken. That is, infestations of the pest plant species will remain within the mapped Containment Area. The Regional Biodiversity Programme implements pest control in prioritised sites of high natural value across the Region, regardless of Containment Area boundaries. Therefore, prioritised high-value natural areas will receive active management (including pest control) even when the site in question falls within any given Containment Area. For species where no effective control currently exists, but current distributions are still limited (eg the aquatic pest plants), control will not be conducted but measures will be taken to reduce the risk of spread outside of the defined Containment Area. In such cases, the Containment Area is the current distribution of the aquatic pest plants.
BOUNDARY CONTROL	The Boundary Control objective aims to prevent invasion of pest plant species across property boundaries. An enforceable setback distance of 20m or 50 m will apply between property boundaries for pest plant species with this objective. The setback distance was determined as a result of a subjective decision-making process. Responsibility for control of pest plant species under the Boundary Control objective lies with the landowner.
MONITORING	Monitoring is a temporary objective for pest plants that are present in the Region but require additional information in order to set control targets. The species will be monitored to assess distribution and abundance. Time limits will be assigned for this information to be gathered, after which costs and feasibility of control will be determined. Pest plant species will only have a Monitoring objective as a temporary status before being moved into one of the remaining three objectives.

6.2 Implementation of Strategy Objectives

6.2.1 Agencies Responsible for Control

The individual management regime indicates the agencies or individuals responsible for the control of the respective pest plants. The key agencies and stakeholders in this Strategy are detailed in Part One, section 5.

6.2.2 Provision of Advice and Information and Advocacy Initiatives

Awareness and understanding of threats and implications of pest plants are imperative for the wider success of their management.

The provision of technical advice and information allows occupiers to make informed decisions and can lead to self-responsibility for pest plant management. To this end, Horizons will:

- promote greater awareness of responsible gardening practices (including species selection and avoidance of garden waste dumping)
- promote awareness of the community's responsibilities under the Strategy
- provide technical advice, best practice control methods, and safe disposal methods. The provision of advice is not restricted to species within this strategy but can extend to species recognised as having a detrimental impact on production or environmental values
- provide a free plant identification service
- establish and maintain ongoing working relationships with (for example) the horticultural industry (plant retailers, landscape companies etc.) and district councils to discourage propagation, sale and use of undesirable plants
- provide practical, technical information on pest plant identification and control (including biocontrol) and disposal methods at garden centres, trade and supply centres, and other places frequented by the communities most affected by pest plants. Such displays should be maintained, regularly updated and have the potential to be, where possible, interactive
- release informative, factually correct and timely media releases to (for example) highlight a particular problem in a particular area, provide general or specific information about a pest plant or pest plants, inform the community of new threats, or report on success stories
- provide advice, technical information and/or written information during the course of property visits as required
- host stalls at garden shows, field days or any organised event that pertains to agriculture, horticulture or land use
- promote awareness of the species included within the Strategy, with a focus on the rural and lifestyle community
- give targeted talks and presentations to community groups (especially botanical societies, horticultural groups and gardening clubs, fishing clubs, water-user groups, tangata whenua representatives)
- conduct in-house training sessions to familiarise staff in all areas of Horizons' operations with pest plant identification, mechanisms of spread and methods of control
- undertake continual development of Horizons' Internet website to include information relating to pest plant identification, biology, methods of control and disposal and information on acquiring, establishing and dispersing biocontrol agents
- there is potential to incorporate community groups as a vehicle for advocacy. Where appropriate, include community groups in advocacy initiatives.

6.2.3 Compliance and Enforcement Process

For the areas of this Strategy that place responsibilities on individuals or agencies other than Horizons, compliance with the Strategy rules will be enforced. Horizons will endeavour to establish good relationships with stakeholders in the first instance, with emphasis placed on achieving willing compliance. However, in instances where passive encouragement is inadequate to achieve the Strategy objectives, compliance will be enforced.

Breaching of Rules

Any breach of a Strategy rule constitutes an offence under section 154 (r) of the Act. The maximum penalty for an offence under section 154 (r) of the Act is in the case of an individual person a fine not exceeding $5,000, and in the case of a corporation, a fine not exceeding $15,000 (section 157). The sale, distribution or propagation of species listed in Part Two of this Strategy is an offence under section 154(m) and carries a maximum penalty of, in the case of an individual person a prison term not exceeding five years, a fine not exceeding $10,000, or both, and in the case of a corporation, a fine not exceeding $200,000 (section 157).

If work is not carried out as specified by a rule, then Horizons may have the work carried out, at the occupier's cost, under section 128 of the Act. This process is outlined in table 6.2.

Table 6.2: Process to be followed to enforce compliance with Strategy rules relating to occupier responsibilities for pest plant control on their property.

Step One **Communication**	Visit property. Occupier informed of Strategy responsibilities. Advice given and timeframes negotiated and agreed upon. A written Request to Clear notice issued.
Step Two **Notice of Direction** (Section 122)	When Step One fails, a Notice of Direction will be issued. The occupier will be informed of the next steps in the process andtimeframes within which to complete control work, and a re-inspection will be scheduled. Failure to comply with a reasonable direction is an offence under s154 (d).
Step Three **Notice of Intention To Act On Default** (Section 128)	When the Notice of Direction has not been complied with by the time specified in the notice, Horizons will cause the required work to be carried out or action taken as necessary. A notice will be issued to occupiers advising of the details of the work or actions taken and the timeframes within which they will be completed.
Step Four **Cost Recovery** (Section 128) **Liens** (Section 129)	Horizons will recover the costs and expenses incurred when acting on default as debt due from the occupier to whom the Notice of Intention to Act on Default was given. A statutory land charge will be placed against the property concerned for non-payment of cost (actual costs of issuing notice and re-inspecting and the costs of control work).

This process is to be followed when compliance is required to achieve Strategy objectives.

6.2.4 Explanation of Strategy Rules

Elements of this Strategy are driven more by overriding philosophies and encouragement than by enforcement. However, to ensure that certain objectives are achieved, and external agencies meet their responsibilities under this Strategy, an enforceable framework is required. Where they apply, Strategy rules are detailed alongside the species in question. A brief overview of the rationale behind the application of rules is provided below.

Surveillance Programme

The pest plant species listed on the National Pest Plant Accord (section 11) are banned from sale, propagation and distribution throughout New Zealand. Horizons is a signatory of this Accord, which is administered by Biosecurity New Zealand. Horizons will assist Biosecurity New Zealand in the implementation of the Accord rules, regardless of whether the species in question is included or excluded from this Strategy.

No further rules are required for the surveillance programme as Horizons is committed to the objectives of this programme. Interagency relationships will be encouraged and nurtured but also do not require rules. Protocols and standard operating procedures will be implemented in the absence of rules to achieve the surveillance programme objectives.

Zero-Density Objective

Pest plants with a Zero-density objective that fall under Horizons control do not require rules as the obligation for control is met under the councils commitment to this Strategy. Responsibility for the control of some species under the Zero-density objective will fall under external agencies (eg Biosecurity New Zealand and Department of Conservation). These species will also not require rules once the Crown agencies accept the obligations and costs as per section 87 of the Act.

Where the responsibility lies with the occupier, the occupier is bound by an enforceable Strategy rule.

Containment Objective

For the species that fall under Horizons control, the obligation for control is met under the council's commitment to this Strategy. In some cases, where pest plant species occur on private land within the relevant Control Area, control may be the responsibility of the occupier. This approach is taken where land is owned by corporate organisations or the Crown. For the remainder of the species under a Containment objective, the desired outcome is deemed worthy of investment by Horizons on private property (within Control Areas). Therefore the majority of pest plants that fall under the Containment objective do not require rules.

Where these plants occur on road reserves or railway corridors outside of the specified Containment Areas, the roading authority or the rail company are bound by Strategy rules.

Boundary Control Objective

The occupier is required to control the pest plants that fall under this category to a defined distance from the property boundary. The underlying purpose of the Boundary Control objective is to prevent spread from infested properties to clean properties. Where land on both sides of the property boundary fence is infested, control is not required and will not be enforced.

Requests (from adjoining occupiers) regarding infestations of Boundary Control objective species in a property boundary situation will be acted on, and control requirements enforced. However, enforcement of boundary clearance rules is not restricted only to situations where there has been receipt of a request. Boundary clearance rules can be enforced wherever required at Horizons' discretion.

If the occupier frequently does not comply with the boundary clearance rule and continual requests from adjacent occupiers (including year to year) are received, authorized Horizons' staff may enforce control of the pest plant in question within an increased distance from the property boundary. This rule is designed to resolve continual problems and will be applied only in extreme circumstances. Initial requests will follow the process as outlined in section 6.2.3.

In certain situations it may be more sensible to maintain the clean land for the specified setback distance (figure 6.2). In such cases the clean land will need to be maintained as clean for the entirety of the setback distance. Situations where this option is likely to be effective are: particularly heavy infestations, erosion prone land, or the species in question is desirable to the occupier (eg gorse).

Monitoring Objective

As this area of work is overseen and administered by Horizons, rules and enforcement are not required.

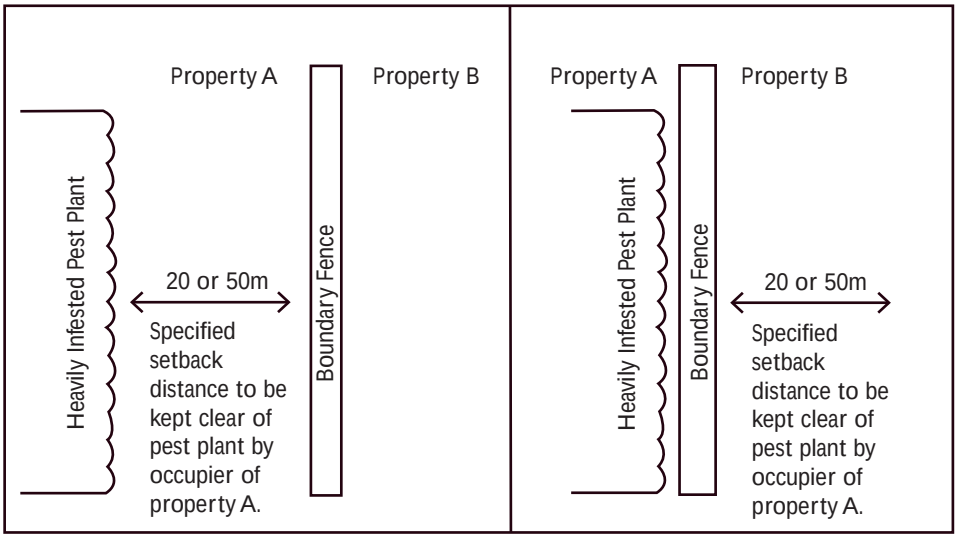


Figure 6.2: Diagrammatic representation of boundary control rules. Box 1 illustrates the standard setback distance rule. Property A has infested land and Property B has clear land. Property A is required to clear infested land for the specified set-back distance. Box 2 illustrates the alternative implementation of the setback distance rule. Property A has infested land and Property B has clear land. Property A is responsible for maintaining Property B's clean land to the specified setback distance.

6.2.5 Monitoring the Objectives of the Strategy

Monitoring provides a measure of how effective work conducted under this Strategy has been. It highlights areas of success and areas where improvements are required.

Robust spreadsheets and databases will be utilised to capture and store data collected during the monitoring of this Strategy. Data collected in the field will be entered regularly so that the Strategy can be reported on in an accurate way at any time. Monitoring is an important component of pest plant management, and pest plant officers have a responsibility to conduct monitoring and collate and store data accurately.

Species-led programmes

There are three areas of monitoring required in order to report on the species-led programmes. They are:

1. Establish whether, and to what degree, occupiers, plant nurseries and retail outlets, stakeholders and members of the public are complying with the Strategy - compliance monitoring.

   - Horizons will inspect plant nurseries and retail outlets (including aquatic pet shops) in the Region at least once a year to ensure no pest plants are being propagated, sold or offered for sale. Inspections will search for pest plants banned from sale, distribution and propagation under this Strategy and the National Pest Plant Accord list. Availability of potential pest plants (Monitoring management objective) for purchase will be noted. Site visits are to be recorded and comments made on outcomes and actions taken where required.
   - After receiving a complaint regarding a pest plant with a Boundary Control management objective, properties will be inspected for pest plant infestations. All complaints will be logged in a complaints register, and inspections recorded. The process, outcome and Horizons' response will also be recorded.
   - All roadside and rail verges will be inspected for pest plant infestations at least once a year. Inspections and results will be recorded. Contact with appropriate roading authorities will be logged. Subsequent exchanges between Horizons and roading authorities will also be logged, with dates of control and other details recorded.

2. Establish the mortality rate and effectiveness of control techniques. Determine to what degree the objectives are being met - success monitoring.

   - All direct control work conducted by Horizons will be logged, citing control techniques employed. Follow-up visits and any further control work will also be logged.
   - Success rates will be recorded and entered into Horizons' database.
   - Biological control agents will be annually surveyed, and population levels and distribution recorded and mapped.
   - Where memoranda of understanding exist between Horizons and other agencies, the parties will meet at least once a year. Work conducted by Horizons under such arrangements will be monitored in the same manner as other work conducted by Horizons under this Strategy. Requests will be made of the other parties to provide monitoring of any control work they may have conducted independent of Horizons' control work.
   - Prior to and following control, infestation size and density will be recorded. This data will be entered into Horizons' database and comparisons drawn between pre- and post-control.
   - Maps will be produced annually for each species, indicating areas of work and known infestation levels.
   - Control work events and result data will be checked against the timeframes associated with each objective.

- The monitoring methodology will be reviewed as required to ensure information on infestation size, density and location is logically and consistently collected across the Region in a manner which is as comprehensive as required whilst remaining simplistic to apply.

3. Establish the extent to which the objectives are being achieved - outcome monitoring.

For the production pest plant species under Boundary Control, the objective is to respond to and resolve complaints between neighbouring properties.The measures taken under point two of this section will suffice to monitor this outcome.

Site-led programmes

Monitoring of site-led programmes will incorporate both success monitoring (mortality rates) and outcome monitoring (have health and condition of the site been improved as a result of management activities).

Outcome monitoring will be driven by the Regional Monitoring Strategy (RMS)[5], and all site-led work arising from this Strategy will be in accordance with the RMS.

Additional Monitoring

- Horizons will record the number of public complaints regarding pest plants, details of each complaint and the response required/actions taken.
- Horizons will record the number of enquiries regarding pest plants, details of the enquiries and the response required/actions taken.
- A catalogue of all advocacy events (press releases, talks to community groups, production of publications, attendance at shows and community events etc) will be maintained, including details of methods, target audience, community responses and outcomes.
- Any trials of new control techniques (new products, new methods or existing products applied at different rates) will be monitored, and results presented in a coherent manner and made accessible to other staff, and where appropriate external agencies, community groups or members of the public.
- Community groups undertaking pest plant management control programmes with the assistance, or under the guidance, of Horizons, will be encouraged to conduct monitoring as a component of their programme. Horizons will provide advice and training on monitoring methods as required.
- Horizons will monitor work plan costs against budgets.

[5] The Regional Monitoring Strategy is currently being drafted and will be responsible for providing direction and methodology for all outcome monitoring of Horizons' projects.

6.2.6 Reporting on Monitoring

Horizons will report annually, by November, on work conducted under this Strategy.

Such reporting will include, but is not restricted to:

- Change (positive or negative) in infestation number, size or density of all species subject to Horizons' control under this Strategy. Reasons for the changes will also be provided.
- Change (positive or negative) in population size and distribution of all biocontrol agents. Suggested reasons for the changes will also be provided.
- The results of any trials of products or control techniques. Reporting on trials should include details of methodology, product and species involved, results, possible influencing factors (weather conditions, disturbance of site etc), conclusions and recommendations.
- Evaluations of the work plan. Where monitoring indicates that a change in control technique, method of delivery or management objective is required, a case will be made and considered.
- Reporting on awareness campaigns and advocacy initiatives. Such reporting should indicate the success or otherwise of such initiatives and give guidance and direction for future campaigns.
- Details of community initiatives, including extent, methods and results.

7. PRODUCTION PEST PLANTS

7.1 Introduction

New Zealand's economy is dominated by 140 species, nearly all of them exotic (Williams and Timmins, 2002). Many species introduced into New Zealand for economic benefit have subsequently become detrimental to both production land and natural values - for example, gorse, which was one of the first plants to be declared a weed (Veitch and Clout, 2001).

The New Zealand Biosecurity Strategy (NZBSS) 2003 states that almost 60% of our exports and 20% of our Gross Domestic Product (GDP) are dependent on primary production. Annually, New Zealand spends approximately $60 million to protect the country from pest plants, with a further loss to the economy of $40 million attributable to pest plants (Williams and Timmins, 2002). With this economic reliance on primary production, and the immense cost to the economy caused by invasive species, a national biosecurity framework is imperative.

The Manawatu-Wanganui Region's economy is also heavily reliant on the agricultural sector (Horizons, 2005) and is prone to the same risks. The production pest plants covered by this Strategy are largely those that have been carried through from historical legislation and remain of considerable concern to the farming community.

While there have been no new production pest plant species established in New Zealand in the last twenty years there are a number of species that the Manawatu-Wanganui Region is currently free of. It is highly desirable to maintain this situation.

7.2 Management Objectives

The Production Pest Plant Programme will incorporate a number of objectives in order to manage the species included in this programme. These are:

- Zero-density
- Boundary Control
- Containment.

A further six production pest plants appear in the Surveillance Programme.

7.3 Performance Measures and Monitoring

Performance measures of the Production Pest Plant Programme are as follows:

- All complaints regarding Boundary Control clearance issues will be responded to within two working days.
- Where a complaint has been received regarding Boundary Control clearance rules, a site visit to the offending property will be arranged. A Request To Clear will be issued during this visit and advice given on the means to achieve the desired outcomes.
- In the instances of non-compliance with a Request To Clear within the agreed timeframe, a Notice of Direction will be issued. Re-inspection will be conducted after the agreed time and further action (Act On Default) conducted if required.
- All requests for information and advice will be responded to at the time of request or in a timely manner should further research/information be required.
- Plant identification requests will be undertaken and additional botanical expertise engaged where necessary.
- For species under a Zero-density objective, Horizons will conduct control following best practice and cost-effective methods. Follow-up control will be conducted as required.
- All occurrences, or suspected occurrences, of pest plant species under a Biosecurity New Zealand National Strategy (included under the Surveillance Programme) will be reported to Biosecurity New Zealand.

These performance measures will be monitored.

- A database of complaints received will be maintained. The database will include information on the process followed in response to the complaints.
- A database of site visits will be maintained and will stipulate the purpose and outcome of the visit.
- Records will be kept of all Requests To Clear, Notices of Direction and Notices of Intention To Act On Default issued.

- All requests for information and advice will be logged, stating request, response/information given and time spent dealing with the request.
- All work conducted by Horizons for species under a Zero-density objective will be recorded. Control work operations will be monitored for success. Infested sites will be monitored and the extent of infestation recorded. Once the Zero-density objective has been achieved at each site, monitoring will continue to ensure no re-infestation occurs.

7.4 Production Pest Plant Species Listed in this Strategy

Table 7.1: Production pest plant species listed in this strategy. The management objective for each species is indicated, as are additional initiatives Horizons will use to assist occupiers in managing these pest plant species. A tick (✓) in the biocontrol column indicates that biocontrol agents are already available, an asterix (*) indicates that a biocontrol research programme is underway for this species, and a circle (◉) indicates that should a biocontrol research programme be initiated in the future, Horizons will support it.

Species	Surveillance	Zero-Density	Boundary Control	Biocontrol	Enforcement	Advice
African feather grass *Pennisetum macrourum*		✓ Horizons				
African love grass *Eragrostis curvula*	✓ Biosecurity New Zealand					
Australian sedge *Carex longebrachiata*			✓ Occupier (20 m)		✓	✓
Blackberry *Rubus fructicosus* agg.			✓ Occupier (20 m)	✓	✓	✓
Broom *Cytisus scoparius*			✓ Occupier (20 m)	✓	✓	✓
Chilean needle grass *Nassella neesiana*	✓ Horizons					
Chinese pennisetum *Pennisetum alopecuroides*		✓ Horizons				
Gorse *Ulex europaeus*			✓ Occupier (20 m)	✓	✓	✓
Johnson grass *Sorgnum halepense*	✓ Biosecurity New Zealand					

Species	Surveillance	Zero-Density	Boundary Control	Biocontrol	Enforce-ment	Advice
Nassella tussock *Nassella trichotoma* and *N. tenuissima*		✓ Horizons				
Nodding thistle *Carduus nutans*			✓ Occupier (50 m)	✓	✓	✓
Ragwort *Senecio jacobaea*			✓ Occupier (50 m)	✓	✓	✓
Skeleton weed *Chondrilla juncea*	✓ Biosecurity New Zealand					
Tutsan *Hypericum androsaemum*			Occupier (20 m)			
Variegated thistle *Silybum marianum*			Occupier (50 m)	⦿		✓
Woolly nightshade *Solanum mauritianum*		✓ Occupier		*		✓
			✓		✓	✓
			✓		✓	

African feather grass

Pennisetum macrourum

7.4.1

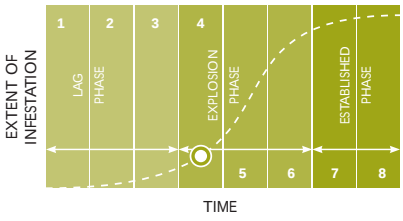
REASON FOR INCLUSION

African feather grass is an aggressive, unpalatable plant which can exclude desirable vegetation and in some situations, out-compete pasture.

It prefers damp situations in swamps and along the borders of streams, but grows in a range of soil types, including sand.

DESCRIPTION

- A robust, rhizomatous, perennial grass.
- Forms dense tussocks up to 2 m tall.
- Dispersed by either seed or stout rhizomes.
- Has a distinctive flower on a narrow, cylindrical stem up to 300 mm long. The flower is yellow/purple in colour with barbed bristles.
- African feather grass flowers from November to April.



DISTRIBUTION

- Known sites in Wanganui, Horowhenua, and along the Manawatu River in Tararua District.
- Area infected is approximately 31 ha.

Unwanted Organism?	yes

Impact evaluation for African feather grass in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land	Tussockland	Wetland and riparian margin	Amenity and recreational value	Transformer species?
Current	✓		✓	✓	
Potential		✓			

MANAGEMENT REGIME FOR AFRICAN FEATHER GRASS

OBJECTIVE

Zero-Density

AIM

Reduce all currently known populations of African feather grass in the Region to Zero-Density by 2010 (Year 3).

MEANS OF DELIVERY

Horizons will undertake direct control of all known plants annually before flowering.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. African feather grass will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by African feather grass. Newly discovered infestations will be subject to management objectives as per this Strategy.

Evaluation:

Post-August 2008, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for African feather grass will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advice and Information:

Horizons will provide advice and information on African feather grass to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

African feather grass is maintained at Zero-density throughout the Region.

African feather grass infestations are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate African feather grass (*Pennisetum macrourum*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

Australian sedge

Carex longebrachiata

7.4.2

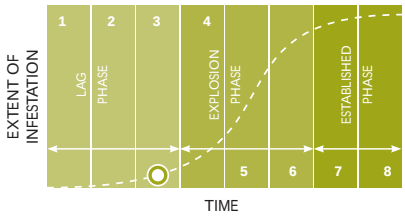
REASON FOR INCLUSION

Australian sedge is generally not palatable to stock. It can form dense stands that exclude pasture species.

Australian sedge will spread from infested land onto clear land but does not compete successfully with well-managed pastures. It is a difficult plant to control once established.

DESCRIPTION

- A perennial, tussock-forming sedge.
- Leaves are Y-shaped in cross-section.
- Flowering stems are triangular in cross-section and sharply angled.
- Flowers are grouped in catkin-like spikes that hang at the end of long, thin nodding stalks.
- The seed is a small, smooth triangular nut. Australian sedge is a prolific seeder, with most seeds falling close to the parent plant.
- Australian sedge is distinguishable from other species of Carex in New Zealand by the way it shoots from the bottom of the original stalk and its distinctive flower/seed head.
- The plant normally flowers and seeds from October to February.



DISTRIBUTION

- Australian sedge is known from seven properties in the Region.
- Australian sedge covers approximately 255 ha.

'Weediness' Score:	22
Unwanted Organism?	no

Impact evaluation for Australian sedge in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land	Tussockland	Wetland and riparian margin	Transformer species?
Current	✓			
Potential				

MANAGEMENT REGIME FOR AUSTRALIAN SEDGE

OBJECTIVE

Boundary Control

AIM

Reduce the occurrence of Australian sedge spreading between properties.

MEANS OF DELIVERY

The responsibility for control of Australian sedge lies with occupiers.

Roading authorities are responsible for control of Australian sedge where it occurs on land they occupy.

TOOLS

Enforcement:

Horizons' staff will respond to complaints regarding property boundary issues regarding Australian sedge infestations by conducting property inspections. Horizons' staff will issue a Request to Clear notice as necessary and follow the enforcement procedure as outlined in section 6.2.3.

Advice and Information:

Horizons will provide advice and information on Australian sedge to occupiers and other interested parties in accordance with section 6.2.2.

Monitoring:

Australian sedge will be monitored in accordance with section 6.2.5.

OUTCOMES

Spread of Australian sedge between properties will be reduced.

Spread of Australian sedge throughout the Region will be slowed.

STRATEGY RULES

Strategy Rule	Explanation
7.4.2.1	Every occupier of a place must control all Australian sedge located within 20 m of the boundary of any adjoining property. For the purposes of this rule, control means: (i) to identify the presence of any Australian sedge not less than every six calendar months and where present destroy all Australian sedge; and (ii) to destroy all Australian sedge within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring Australian sedge within 20 m of the boundary of any adjoining property (identified on the place following inspection) to be destroyed.
7.4.2.2	If rule 7.4.2.1 is not complied with along a boundary with any adjoining property for a period of 12 calendar months an authorised person may (in addition to any other enforcement measures) issue on the occupier of the place a Notice of Direction. If a Notice of Direction is issued under this rule then the occupier of the place must identify and destroy within one calendar month all Australian sedge within 100 m of the boundary of all adjoining properties.
7.4.2.3	Every roading authority shall not less than once every calendar year identify the presence of Australian sedge within the road reserve as defined in section 5.4. All Australian sedge identified shall be destroyed. Every roading authority shall destroy any Australian sedge as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate Australian sedge (*Carex longebrachiata*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

7.4.3

blackberry

Rubus fructicosus agg.

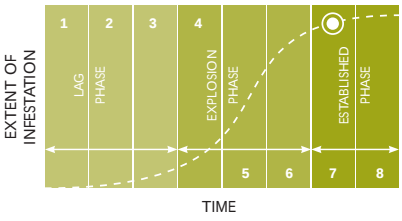
REASON FOR INCLUSION

Blackberry forms impenetrable thickets if unchecked, although it does not compete successfully with well-managed pastures and the new canes are palatable to sheep.

Blackberry will spread between properties from infested land onto clear land. Blackberry affects plantation forest establishment. It suppresses other indigenous plants in scrub and forest margins. Blackberry can displace plant communities and restrict habitats of native organisms, and can reduce recreational and amenity values.

DESCRIPTION

- Blackberry is a prickly, scrambling perennial shrub growing to taller than 2 m.
- The leaves are compound in three to five oval toothed leaflets that are arranged in a five-fingered formation.
- Flowers are large and white or pink.
- Blackberry produces black edible berries.
- Blackberry is spread via bird dispersal of seed and by cane extension.



DISTRIBUTION

- Blackberry is widespread throughout the Region, and has infested approximately 307,000 ha.

'Weediness' score:	31
Unwanted Organism?	no

Impact evaluation for blackberry in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land	Commercial forestry	Disturbed forest habitats and scrubland	Wetland and riparian margin	Amenity and recreational values	Transformer species?
Current	✓	✓	✓	✓	✓	
Potential						

MANAGEMENT REGIME FOR BLACKBERRY

OBJECTIVE

Boundary Control

AIM

Reduce the occurrence of blackberry spreading between properties.

Manage populations of blackberry in high-value natural areas in conjunction with other pest management.

To maintain self-sustaining populations of biocontrol agents for blackberry throughout the Region.

MEANS OF DELIVERY

The responsibility for control of blackberry lies with occupiers.

Roading authorities are responsible for control of blackberry where it occurs on land they occupy.

Horizons will control blackberry infestations in high-value natural areas as directed by individual site management plans.

TOOLS

Enforcement

Horizons' staff will respond to complaints regarding property boundary issues regarding blackberry infestations by conducting property inspections. Horizons' staff will issue a Request to Clear notice as necessary and follow the enforcement procedure as outlined in section 6.2.3.

Advice and Information:

Horizons will provide advice and information on blackberry to occupiers and other interested parties in accordance with section 6.2.2.

Biological Control:

Horizons will continue to release, propagate and redistribute biocontrol agents of blackberry as outlined in section 13.

Monitoring:

Blackberry will be monitored in accordance with section 6.2.5.

OUTCOMES

Spread of blackberry between properties will be reduced.

Spread of blackberry throughout the Region will be slowed.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of blackberry.

STRATEGY RULES

Strategy Rule	Explanation
7.4.3.1	Every occupier of a place must control all blackberry located within 20 m of the boundary of any adjoining property. For the purposes of this rule, control means: (i) to identify the presence of any blackberry not less than every six calendar months and where present destroy all blackberry; and (ii) to destroy all blackberry within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring blackberry within 20 m of the boundary of any adjoining property (identified on the place following inspection) to be destroyed.
7.4.3.2	If rule 7.4.3.1 is not complied with along a boundary with any adjoining property for a period of 12 calendar months an authorised person may (in addition to any other enforcement measures) issue on the occupier of the place a Notice of Direction. If a Notice of Direction is issued under this rule then the occupier of the place must identify and destroy within one calendar month all blackberry within 100 m of the boundary of all adjoining properties.
7.4.3.3	Every roading authority shall not less than once every calendar year identify the presence of blackberry within the road reserve as defined in section 5.4. All blackberry identified shall be destroyed. Every roading authority shall destroy any blackberry as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate blackberry (*Rubus fruticosus* agg.). **A breach of this rule will create an offence under section 154 (m) of the Act.**

broom

Cytisus scoparius

7.4.4

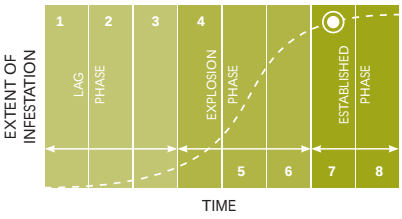
REASON FOR INCLUSION

Broom is invasive on lower productive pastoral land, commercial forestry during tree establishment and in low-stature tussock and alpine areas going up to 1400 m asl.

Broom seedlings are palatable and unable to compete with productive pasture but once established in dense stands, broom can shade out most species. Broom is spread between properties from infested land onto clear land. Broom is widespread in river gravel and is a major contaminant in roading metal. Broom has the potential to spread rapidly and out-compete indigenous plant species of low-stature habitats.

DESCRIPTION

- Broom is an erect, much-branched almost leafless, deciduous woody shrub 1.5-3 m tall.
- The leaves, when present, consist of three leaflets.
- It has golden-yellow flowers in spring followed by explosive pods.
- The majority of seed dispersal occurs within 20 m of the parent plant.



DISTRIBUTION

- Broom is widespread throughout the Region.

'Weediness' Score:	25
Unwanted Organism?	no

Impact evaluation for broom in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land	Commercial forestry	Low-stature habitats (eg shrub and scrublands)	Open, disturbed areas ('wasteland')	Transformer species?
Current	✓	✓	✓	✓	
Potential					

MANAGEMENT REGIME FOR BROOM

OBJECTIVE

Boundary Control

AIM

Reduce the occurrence of broom spreading between properties.

Manage populations of broom in high-value natural areas in conjunction with other pest management (Section 10).

To maintain self-sustaining populations of biocontrol agents for broom throughout the Region.

MEANS OF DELIVERY

The responsibility for control of broom lies with occupiers.

Roading authorities are responsible for control of broom where it occurs on land they occupy. Horizons will control broom infestations in high-value natural areas as directed by individual site management plans.

TOOLS

Enforcement:

Horizons' staff will respond to complaints regarding property boundary issues regarding broom infestations by conducting property inspections. Horizons' staff will issue a Request to Clear notice as necessary and follow the enforcement procedure as outlined in section 6.2.3.

Advice and Information:

Horizons will provide advice and information on broom to occupiers and other interested parties in accordance with section 6.2.2.

Biological Control:

Horizons will continue to release, propagate and redistribute biocontrol agents of broom as outlined in section 13.

Monitoring:

Broom will be monitored in accordance with section 6.2.5.

OUTCOMES

Spread of broom between properties will be reduced.

Spread of broom throughout the Region will be slowed.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of broom.

STRATEGY RULES

Strategy Rule	Explanation
7.4.4.1	Every occupier of a place must control all broom located within 20 m of the boundary of any adjoining property. For the purposes of this rule, control means: (i) to identify the presence of any broom not less than every six calendar months and where present destroy all broom; and (ii) to destroy all broom within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring broom within 20 m of the boundary of any adjoining property (identified on the place following inspection) to be destroyed.
7.4.4.2	If rule 7.4.4.1 is not complied with along a boundary with any adjoining property for a period of 12 calendar months an authorised person may (in addition to any other enforcement measures) issue on the occupier of the place a Notice of Direction. If a Notice of Direction is issued under this rule then the occupier of the place must identify and destroy within one calendar month all broom within 100 m of the boundary of all adjoining properties.
7.4.4.3	Every roading authority shall not less than once every calendar year identify the presence of broom within the road reserve as defined in section 5.4. All broom identified shall be destroyed. Every roading authority shall destroy any broom as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate broom (*Cytisus scoparius*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

7.4.5

Chinese Pennisetum

Pennisetum alopecuroides

REASON FOR INCLUSION

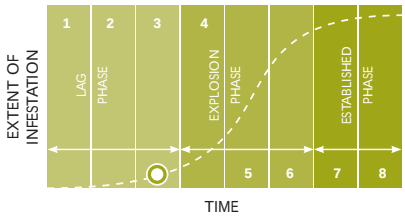
Chinese Pennisetum reduces pasture productivity and is generally unpalatable to stock.

Although Chinese Pennisetum does not compete successfully with dense, productive pasture, it has the ability to spread through the Region's hill-country. It is a difficult plant to control once established, as small plants are difficult to spot amongst other grasses and rushes.

Control has been attempted, with some success, but complete control has proved difficult.

DESCRIPTION

- Chinese Pennisetum is a tufted perennial grass that forms large tussocks around 1 m in height.
- Leaves are long, wiry and hairless.
- Flower heads are purplish, bristly, cylindrical spikes.



DISTRIBUTION

- The Chinese Pennisetum infestation now extends at light density over approximately 1000 ha.
- The infestation now borders other properties.

'Weediness' score:	unclassified
Practicality score:	6
Unwanted Organism?	yes

Impact evaluation for Chinese Pennisetum in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land
Current	✓
Potential	

MANAGEMENT REGIME FOR CHINESE PENNISETUM

OBJECTIVE

Zero-Density

AIM

Reduce the population of Chinese Pennisetum to Zero-density by 2027 (Year 20).

Prevent spread of Chinese Pennisetum into neighbouring properties.

MEANS OF DELIVERY

Horizons will, in partnership with the occupier, undertake direct control of all known plants annually before flowering.

TOOLS

Evaluation:

Post- August 2010, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for Chinese pennisetum will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advice and Information

Horizons will provide advice and information on Chinese pennisetum to occupiers and other interested parties in accordance with section 6.2.2.

Monitoring:

Chinese pennisetum will be monitored in accordance with section 6.2.5.

OUTCOMES

Chinese pennisetum is maintained at Zero-density throughout the Region.

Chinese Pennisetum infestations are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate Chinese Pennisetum (*Pennisetum alopecuroides)*. **A breach of this rule will create an offence under section 154 (m) of the Act.**

7.4.6

gorse

Ulex europaeus

REASON FOR INCLUSION

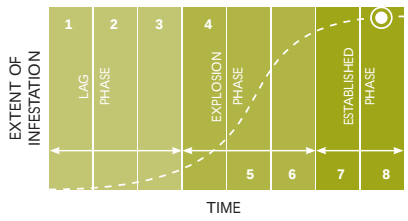
Gorse forms dense spiny thickets that prevent stock from grazing and reduces pasture production. Gorse can spread between properties from infested to clean land and is a major production pest plant.

Gorse is widespread and present in high density throughout the country. The extent of gorse dispersal via the seed bank, seed rain, through machinery and stock is considerable. Gorse is established at densities that render widespread eradication programmes redundant and impossible to achieve. An acceptance of gorse in our landscape is required. Gorse will continue to spread and increase in density, however there is a valid concern regarding spread of this plant between properties. Boundary control will not eliminate spread of gorse, but can assist in slowing the spread, and maintaining clean land.

Gorse provides some benefits as a nursery plant for indigenous species, as a nitrogen fixer and a provider of pollen and nectar for bees. Gorse can also stabilise steep slopes, which helps minimise the effects of erosion.

DESCRIPTION

- Gorse is a sharply spinous, woody, perennial shrub able to grow almost anywhere.
- The leaves are narrow deeply furrowed rigid spines between 15-30 mm long.
- Gorse flowers mostly in autumn, winter and early spring, producing yellow pea-like flowers.
- Gorse is dispersed by explosive seedpods (up to 5 m), stock, humans, water, gravel, machinery and wind.
- Gorse seeds remain viable in the seed-bank for many years.



DISTRIBUTION

- Gorse is widespread throughout the Region, with dense populations in many places.
- An estimated 468,000 ha is infested with gorse.

'Weediness' score:	28
Unwanted Organism?	no

Impact evaluation for gorse in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land	Commercial forestry	Disturbed forest habitats and scrubland	Wetland and riparian margin	Amenity and recreational values
Current	✓	✓	✓	✓	✓
Potential					

MANAGEMENT REGIME FOR GORSE

OBJECTIVE

Boundary Control

AIM

Reduce the occurrence of gorse spreading from infested land to clean land.

Where necessary, manage populations of gorse in high-value natural areas in conjunction with other pest management.

Maintain self-sustaining populations of biocontrol agents for gorse throughout the Region.

MEANS OF DELIVERY

The responsibility for control of gorse lies with occupiers.

Roading authorities are responsible for control of gorse where it occurs on land they occupy.

Horizons will, at its discretion, control gorse infestations in high priority natural areas as directed by individual site management plans. It is acknowledged that in some cases retention of gorse may be beneficial to the management of the site.

TOOLS

Advice and Information:

Horizons will provide advice and information on gorse to occupiers and other interested parties in accordance with section 6.2.2.

Biological control:

Horizons will continue to release, propagate and re-distribute biocontrol agents of gorse as outlined in section 13.

Monitoring:

Gorse will be monitored in accordance with section 6.2.5.

OUTCOMES

Spread of gorse between properties will be reduced.

Spread of gorse throughout the Region will be slowed.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of gorse.

STRATEGY RULES

Strategy Rule	Explanation
7.4.6.1	Every occupier of a place must control all gorse located within 20 m of the boundary of any adjoining property. For the purposes of this rule, control means: (i) to identify the presence of any gorse not less than every six calendar months and where present destroy all gorse; and (ii) to destroy all gorse within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring gorse within 20 m of the boundary of any adjoining property (identified on the place following inspection) to be destroyed.
7.4.6.2	If rule 7.4.6.1 is not complied with along a boundary with any adjoining property for a period of 12 calendar months an authorised person may (in addition to any other enforcement measures) issue on the occupier of the place a Notice of Direction. If a Notice of Direction is issued under this rule then the occupier of the place must identify and destroy within one calendar month all gorse within 100 m of the boundary of all adjoining properties.
7.4.6.3	Every roading authority shall not less than once every calendar year identify the presence of gorse within the road reserve as defined in section 5.4. All gorse identified shall be destroyed. Every roading authority shall destroy any gorse as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate gorse (*Ulex europaeus*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

Nassella tussock

Nassella trichotoma and *N. tenuissima*
including narrow needle grass

7.4.7

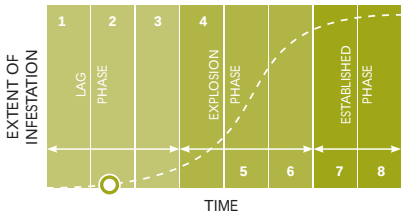
REASON FOR INCLUSION

The Nassella genus includes extremely vigorously invasive species which crowd out desirable pasture species reducing stock-carrying capacity by up to 10%.

Identification of the two species is complicated and as both species are undesirable both have been included under this Strategy. Nassella tussock is currently at population densities that have the potential to be eradicated from the Region.

DESCRIPTION

- Nassella tussock is a vigorous perennial grass with numerous drooping fine and wiry leaves.
- The plants grow up to 1 m tall and have a dense fibrous root system.
- Flowers are open-branched panicles, purple in colour, erect when young and drooping as the tussock matures.
- Nassella tussock flowers from October to December.
- Seeds are wind dispersed and can travel up to 16 km from the parent plant.
- Identification between the two species requires specialist botanical skills.



DISTRIBUTION

- Nassella tussock is currently known at only one site in the Region, near Kakariki.
- Nassella tussock covers approximately 2 ha.

'Weediness' score: *(N. trichotoma)*	27
'Weediness' score: *(N. tenuissima)*	26
Practicality score:	5
Unwanted Organism?	yes *(N. tenuissima)*

Impact evaluation for Nassella tussock in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land
Current	✓
Potential	

MANAGEMENT REGIME FOR NASSELLA TUSSOCK

OBJECTIVE

Zero-density

AIM

Reduce all currently known populations of Nassella tussock in the Region to Zero-density by 2011 (Year 4).

MEANS OF DELIVERY

Horizons will undertake direct control of all known plants annually before flowering.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Nassella tussock will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by Nassella tussock. Newly discovered infestations will be subject to management objectives as per section 7.

Evaluation:

Post-August 2009, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for Nassella tussock will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advice and Information:

Horizons will provide advice and information on Nassella tussock to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Nassella tussock is maintained at Zero-Density throughout the Region.

Nassella tussock infestations are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate Nassella tussock (*Nassella trichotoma* and *N. tenuissima*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

nodding thistle

Carduus nutans

7.4.8

REASON FOR INCLUSION

Nodding thistle is a highly aggressive agricultural pest affecting pasture production and is particularly invasive on light, sandy and volcanic soils.

The thistle can form dense stands up to 150,000 plants/ha. Dense infestations obstruct livestock movement and prevent access to pasture. Nodding thistle produces 10,000 seeds per plant with 60-80% viability. Seed may be dormant in the soil for up to 20 years.

Nodding thistle is widespread. The extent of nodding thistle dispersal via the seed-bank, seed-rain, through machinery and stock is considerable. Nodding thistle is established at densities that render widespread eradication programmes redundant and impossible to achieve. An acceptance nodding thistle in our landscape is required.

Nodding thistle will continue to spread and increase in density, however there is a valid concern regarding the spread of this plant between properties. Boundary control will not eliminate spread of nodding thistle, but can assist in slowing the spread, and maintaining clean land.

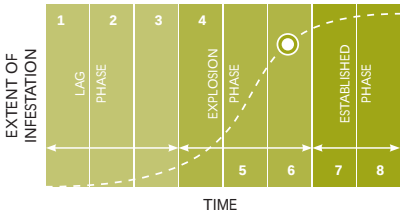
DESCRIPTION

- Nodding thistle is a spiny-leafed (usually) biennial plant.
- The leaves are narrow and oblong, up to 18 cm long by 10 cm wide, with whitish margins at the bases of marginal spines.
- Flower stalks can be greater than 75 cm tall, with red-purple or (very rarely) white composite flowers.
- Flowers are followed by seed heads containing many seeds with thistledown.

Weediness score:	20
Unwanted Organism?	no

DISTRIBUTION

- Nodding thistle is present throughout the Region, however there are marked local differences, with it being widespread in parts of the Region and a new invader in others.
- Nodding thistle has infested approximately 213,000 ha of production land.



Impact evaluation for nodding thistle in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land
Current	✓
Potential	

MANAGEMENT REGIME FOR NODDING THISTLE

OBJECTIVE

Boundary Control

AIM

Reduce the occurrence of nodding thistle spreading between properties.

Achieve self-sustaining populations of biocontrol agents for nodding thistle throughout the Region.

MEANS OF DELIVERY

The responsibility for control of nodding thistle lies with the occupiers.

Roading authorities are responsible for control of nodding thistle where it occurs on land they occupy.

TOOLS

Enforcement:

Horizons' staff will respond to complaints regarding property boundary issues regarding nodding thistle infestations by conducting property inspections. Horizons' staff will issue a Request to Clear notice as necessary and follow the enforcement procedure as outlined in section 6.2.3.

Advice and Information:

Horizons will provide advice and information on nodding thistle to occupiers and other interested parties in accordance with section 6.2.2.

Biological Control:

The nodding thistle gall weevil is proving to be a highly effective biological control agent. Horizons will continue to release, propagate and redistribute biocontrol agents of nodding thistle as outlined in section 13.

Monitoring:

Nodding thistle will be monitored in accordance with section 6.2.5.

OUTCOMES

Spread of nodding thistle between properties will be slightly reduced.

Spread of nodding thistle throughout the Region will be slightly slowed.

STRATEGY RULES

Strategy Rule	Explanation
7.4.8.1	Every occupier of a place must control all nodding thistle located within 50m of the boundary of any adjoining property. For the purposes of this rule, control means: (i) to identify the presence of any nodding thistle not less than every six calendar months and where present destroy all nodding thistle; and (ii) to destroy all nodding thistle within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring nodding thistle within 20 m of the boundary of any adjoining property (identified on the place following inspection) to be destroyed.
7.4.8.2	If rule 7.4.8.1 is not complied with along a boundary with any adjoining property for a period of 12 calendar months an authorised person may (in addition to any other enforcement measures) issue on the occupier of the place a Notice of Direction. If a Notice of Direction is issued under this rule then the occupier of the place must identify and destroy within one calendar month all nodding thistle within 100 m of the boundary of all adjoining properties.
7.4.8.3	Every roading authority shall not less than once every calendar year identify the presence of nodding thistle within the road reserve as defined in section 5.4. All nodding thistle identified shall be destroyed. Every roading authority shall destroy any nodding thistle as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate nodding thistle (*Carduus nutans*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

7.4.9

ragwort

Senecio jacobaea

REASON FOR INCLUSION

Ragwort is competitive with pasture species and subsequently production is reduced by ragwort infestations.

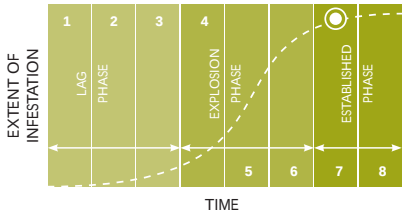
Ragwort contains alkaloids that are toxic to stock. The plant is able to produce 50,000-150,000 seeds/plant, of which 70% may be viable. Sheep are effective in controlling small plants, however ragwort is unpalatable to cattle, deer or horses.

Ragwort is widespread in New Zealand. The extent of ragwort dispersal via the seed-bank, seed-rain, through machinery and stock is considerable. Ragwort is established at densities that render widespread eradication programmes redundant and impossible to achieve. An acceptance of ragwort in our landscape is required.

Ragwort will continue to spread and increase in density, however there is a valid concern regarding the spread of this plant between properties. Boundary control will not eliminate spread of ragwort, but can assist in slowing the spread, and maintaining clean land.

DESCRIPTION

- Ragwort is a robust, branched, biennial or perennial plant up to 1.5 m tall.
- The plant emits an unpleasant smell when crushed.
- It produces a basal rosette of pinnately lobed leaves.
- Ragwort produces numerous bright yellow flowers in flat-topped clusters in its second year.
- Ragwort flowers between November and April.



DISTRIBUTION

- Ragwort is widespread throughout the Region, in varying population densities.
- Ragwort currently infests an estimated 368,000 ha of production land.

'Weediness' score:	23
Unwanted Organism?	no

Impact evaluation for ragwort in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land
Current	✓
Potential	

MANAGEMENT REGIME FOR RAGWORT

OBJECTIVE

Boundary Control

AIM

Reduce the occurrence of ragwort spreading between properties.

Maintain self-sustaining populations of biocontrol agents for ragwort throughout the Region.

MEANS OF DELIVERY

The responsibility for control of ragwort lies with occupiers.

Roading authorities are responsible for control of ragwort where it occurs on land they occupy.

TOOLS

Enforcement:

Horizons' staff will respond to complaints regarding property boundary issues regarding ragwort infestations by conducting property inspections. Horizons' staff will issue a Request to Clear notice as necessary and follow the enforcement procedure as outlined in section 6.2.3.

Advice and Information:

Horizons will provide advice and information on ragwort to occupiers and other interested parties in accordance with section 6.2.2.

Biological Control:

The ragwort flea beetle is a highly effective biological control agent and has reduced the cost of control where it is now common. Horizons will continue to release, propagate and re-distribute biocontrol agents of ragwort as outlined in section 13.

Monitoring:

Ragwort will be monitored in accordance with section 6.2.5 of this Strategy.

OUTCOMES

Spread of ragwort between properties will be slightly reduced.

Spread of ragwort throughout the Region will be slightly slowed.

STRATEGY RULES

Strategy Rule	Explanation
7.4.9.1	Every occupier of a place must control all ragwort located within 50 m of the boundary of any adjoining property. For the purposes of this rule, control means: (i) to identify the presence of any ragwort not less than every six calendar months and where present destroy all ragwort; and (ii) to destroy all ragwort within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring ragwort within 50 m of the boundary of any adjoining property (identified on the place following inspection) to be destroyed.
7.4.9.2	If rule 7.4.9.1 is not complied with along a boundary with any adjoining property for a period of 12 calendar months an authorised person may (in addition to any other enforcement measures) issue on the occupier of the place a Notice of Direction. If a Notice of Direction is issued under this rule then the occupier of the place must identify and destroy within one calendar month all ragwort within 100 m of the boundary of all adjoining properties.
7.4.9.3	Every roading authority shall not less than once every calendar year identify the presence of ragwort within the road reserve as defined in section 5.4. All ragwort identified shall be destroyed. Every roading authority shall destroy any ragwort as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate ragwort (*Senecio jacobaea*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

tutsan

Hypericum androsaemum

7.4.10

REASON FOR INCLUSION

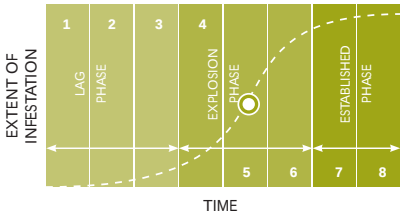
Tutsan is a highly aggressive pest plant especially invasive on marginal production land, but can establish in riparian margins, forest margins and roadsides. Tutsan has also been recorded growing in shade under forest canopy.

Tutsan escaped from cultivation in 1870 and is now found throughout New Zealand. favouring marginal land and higher rainfall areas. Tutsan is non-toxic but is unpalatable to stock.

Although control of tutsan can be difficult and expensive, the problematic infestations are currently confined to the Ruapehu District. Prevention of further spread is desirable.

DESCRIPTION

- Tutsan is an evergreen or semi-evergreen shrub up to 1.5 m tall.
- The flowers are pale yellow, appearing in clusters of 2-8 flowers. Fruits are red, becoming black when ripe.
- Tutsan leaves are pale green, often bluish-green below, egg-shaped and attached to stems at the broad end of the leaf.
- Tutsan flowers from November to February followed by fruit set. Seeds are dispersed primarily by birds.



DISTRIBUTION

- Dense infestations of tutsan are present within Ruapehu District and are starting to spread down the Whanganui River.

'Weediness' score:	unclassified
Unwanted Organism?	no

Impact evaluation for tutsan in the Manawatu-Wanganui Region.

Area and Extent of Effect	Production land	Forest margins	Riparian margins	Amenity and recreational values
Current	✓	✓	✓	
Potential				✓

MANAGEMENT REGIME FOR TUTSAN

OBJECTIVE

Boundary Control

AIM

Reduce the occurrence of tutsan spreading from infested land to clean land.

Reduce the spread of tutsan from the Ruapehu District to elsewhere in the Region.

Where necessary, manage populations of tutsan in high-value natural areas in conjunction with other pest management.

Investigate and support biocontrol options for tutsan.

MEANS OF DELIVERY

The responsibility for control of tutsan lies with occupiers.

Roading authorities are responsible for control of tutsan where it occurs on land they occupy.

Horizons will control tutsan infestations in high-value natural areas as directed by individual site management plans.

TOOLS

Advice and Information:

Horizons will provide advice and information on tutsan to occupiers and other interested parties in accordance with section 6.2.2.

Biological control:

Horizons will continue to investigate options for a tutsan biocontrol programme, including sourcing funding, initiating research or coordinating community groups.

Monitoring:

Tutsan will be monitored in accordance with section 6.2.5.

OUTCOMES

Spread of tutsan between properties will be reduced.

Spread of tutsan throughout the Region will be slowed.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of tutsan.

STRATEGY RULES

Strategy Rule	Explanation
7.4.10.1	Every occupier of a place must control all tutsan located within 20 m of the boundary of any adjoining property. For the purposes of this rule, control means: (i) to identify the presence of any tutsan not less than every six calendar months and where present destroy all tutsan; and (ii) to destroy all tutsan within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring tutsan within 20 m of the boundary of any adjoining property (identified on the place following inspection) to be destroyed.
7.4.10.2	If rule 7.4.10.1 is not complied with along a boundary with any adjoining property for a period of 12 calendar months an authorised person may (in addition to any other enforcement measures) issue on the occupier of the place a Notice of Direction. If a Notice of Direction is issued under this rule then the occupier of the place must identify and destroy within one calendar month all tutsan within 100 m of the boundary of all adjoining properties.
7.4.10.3	Every roading authority shall not less than once every calendar year identify the presence of tutsan within the road reserve as defined in section 5.4. All tutsan identified shall be destroyed. Every roading authority shall destroy any tutsan as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate tutsan (*Hypericum androsaemum*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

7.4.11

variegated thistle

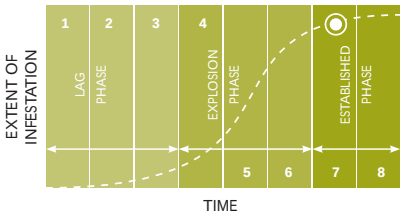
Silybum marianum

REASON FOR INCLUSION

Variegated thistle can form dense infestations suppressing pasture species, and has a long-lived seed. The thistle can be injurious and toxic to stock.

DESCRIPTION

- Variegated thistle is a spiny annual herbaceous plant which grows best on fertile soils.
- Leaves are green with white markings and have sharp teeth.
- A large solitary, spiny red-purple flower is produced on stalks up to 2 m tall from November to January. Seeds are produced from December to March.



DISTRIBUTION

- Variegated thistle is widespread throughout the Region in varying density, and infests approximately 203,300 ha.

'Weediness' score:	21
Unwanted Organism?	no

Impact evaluation for variegated thistle in the Manawatu-Wanganui Region.

Area and Extent of Effect	Production land
Current	✓
Potential	

MANAGEMENT REGIME FOR VARIEGATED THISTLE

OBJECTIVE

Boundary Control.

AIM

Reduce the occurrence of variegated thistle spreading from infested land to clean land.

MEANS OF DELIVERY

Horizons will, in partnership with the occupier, undertake direct control of all known plants annually before flowering.

TOOLS

Advice and Information:

Horizons will provide advice and information on variegated thistle to occupiers and other interested parties in accordance with section 6.2.2.

Biological control:

Should a biocontrol research programme be initiated in the future, Horizons will support this programme.

Monitoring:

Variegated thistle will be monitored in accordance with section 6.2.5.

OUTCOMES

Spread of variegated thistle between properties will be reduced.

Spread of variegated thistle throughout the Region will be slowed.

STRATEGY RULES

Strategy Rule	Explanation
7.4.11.1	Every occupier of a place must control all variegated thistle located within 50 m of the boundary of any adjoining property. For the purposes of this rule, control means: (i) to identify the presence of any variegated thistle not less than every six calendar months and where present destroy all variegated thistle; and (ii) to destroy all variegated thistle within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring variegated thistle within 50 m of the boundary of any adjoining property (identified on the place following inspection) to be destroyed.
7.4.11.2	If rule 7.4.11.1 is not complied with along a boundary with any adjoining property for a period of 12 calendar months an authorised person may (in addition to any other enforcement measures) issue on the occupier of the place a Notice of Direction. If a Notice of Direction is issued under this rule then the occupier of the place must identify and destroy within one calendar month all variegated thistle within 100 m of the boundary of all adjoining properties.
7.4.11.3	Every roading authority shall not less than once every calendar year identify the presence of variegated thistle within the road reserve as defined in section 5.4. All variegated thistle identified shall be destroyed. Every roading authority shall destroy any variegated thistle as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate variegated thistle (*Silybum marianum*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

7.4.12

woolly nightshade

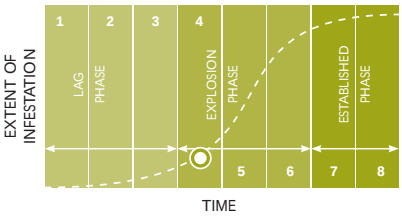
Solanum mauritianum

REASON FOR INCLUSION

Woolly nightshade is an aggressive and rapidly growing plant that can establish quickly in poorly managed land, hillcountry and forest margins. The species is very competitive and readily invades over the top of gorse.

DESCRIPTION

- Woolly nightshade is a shrub or small tree capable of growing as tall as 5 m.
- Leaves are large (10-25 x 3.5-10 cm), entire, light to dark green on upper surface, white to yellowish green on the lower surface.
- Flowers occur in dense clusters (January-December), usually mauve to purple in colour, or white on occasion.
- Woolly nightshade produces a spherical berry (c. 1 cm in diameter), dull yellow in colour.
- Woolly nightshade is primarily bird-dispersed.



DISTRIBUTION

- Woolly nightshade is present in dense populations around Wanganui, but currently sparse elsewhere in the Region.
- Currently, an estimated 100 ha of production land is infested with woolly nightshade.
- Further infestations are scattered over an estimated 630 ha of commercial forestry, marginal land and urban areas.

'Weediness' score:	24
Practicality score:	5
Unwanted Organism?	no

Impact evaluation for woolly nightshade in the Manawatu-Wanganui Region.

Area and Extent of Effect	Agricultural production land	Commercial forestry	Disturbed forest margins	Riparian margin
Current	✓	✓		✓
Potential			✓	

MANAGEMENT REGIME FOR WOOLLY NIGHTSHADE

OBJECTIVE

Zero-Density.

AIM

Reduce all populations of woolly nightshade in the Region to Zero-density by 2010 (Year 3).

MEANS OF DELIVERY

The occupier will be responsible for control of woolly nightshade within the property boundaries occupied by them.

Roading authorities are responsible for control of woolly nightshade where it occurs on land they occupy.

TOOLS

Enforcement:

Horizons' staff will enforce the Zero-density objective on occupiers. Horizons' staff will issue a Request to Clear notice as necessary and follow the enforcement procedure as outlined in section 6.2.3.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by woolly nightshade. In the case of discovery of new infestations, Horizons' staff will inform the occupier of their responsibilities for woolly nightshade control under this Strategy.

Evaluation:

Post-August 2007, this programme will be evaluated. Should the number of new sites have increased to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for woolly nightshade will be adjusted accordingly. This could result in incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advice and Information:

Horizons will provide advice and information on woolly nightshade to occupiers and other interested parties in accordance with section 6.2.2.

Biological Control:

Horizons may provide logistic and financial assistance for any research initiative for a biocontrol agent for woolly nightshade. Should a suitable biocontrol agent be developed, Horizons may undertake to release, propagate and re-distribute this agent as appropriate.

Monitoring:

Woolly nightshad will be monitored in accordance with section 6.2.5.

OUTCOMES

Woolly nightshade is maintained at Zero-density throughout the Region.

Woolly nightshade infestations are contained to outside the Manawatu-Wanganui Region.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of woolly nightshade.

STRATEGY RULES

Strategy Rule	Explanation
7.4.12.1	Every occupier of a place must control all woolly nightshade located on the property they occupy. For the purposes of this rule, control means: (i) to identify the presence of any woolly nightshade not less than every six calendar months and where present destroy all woolly nightshade; and (ii) to destroy all woolly nightshade within 21 calendar days of a Notice of Direction being served on the occupier by an authorised person requiring all woolly nightshade within the boundary of the property they occupy (identified on the place following inspection) to be destroyed.
7.4.12.2	Every roading authority shall not less than once every calendar year identify the presence of woolly nightshade within the road reserve as defined in section 5.4. All woolly nightshade identified shall be destroyed. Every roading authority shall destroy any woolly nightshade as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate woolly nightshade (*Solanum mauritanum*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

8. ENVIRONMENTAL PEST PLANTS

8.1 Introduction

Due to Region-wide habitat loss and changing land use, our indigenous species, landscapes and habitats are further threatened by and highly vulnerable to pests. Environmental pest plants in general are widespread throughout our Region.

The Region's biodiversity is threatened by pest plants that cause the collapse of forest canopies, smother regeneration in natural areas, invade alpine and tussock land, degrade wetlands and clog waterways. This programme covers pest plant species that threaten the terrestrial and aquatic biodiversity and natural areas of the Region.

8.2 Management Objectives

The environmental pest plants will be managed under three management objectives:

- Zero-density (low incidence, high-risk species)
- Containment (widespread, high-density species; reducing spread, containing infestations)
- Monitoring (potential pest plant species).

A further two terrestrial and six aquatic environmental pest plants fall under the Surveillance Programme (section 9).

8.3 Performance Measures and Monitoring

- All existing spatial information of known current infestations of listed terrestrial pest plant species will be collected and electronically stored by 2007. This database will be a dynamic database and additions and corrections will be ongoing.
- Wherever interagency agreements (or memoranda of understanding) are in place, such arrangements are being met.
- In the instances of non-compliance with a Request To Clear within the agreed timeframe, a Notice of Direction will be issued. Re-inspection will be conducted after the agreed time and further action (Act On Default) conducted if required.
- All requests for information and advice will be responded to at the time of request or in a timely manner should further research/information be required.
- Plant identification requests will be undertaken and additional botanical expertise engaged where necessary.
- For species under a Zero-density objective, Horizons will conduct control following best practice and cost-effective methods. Follow-up control will be conducted as required.
- All occurrences, or suspected occurrences, of pest plant species under a Biosecurity New Zealand National Strategy (included under the Surveillance programme) will be reported to Biosecurity New Zealand.
- The aims for each terrestrial pest plant have been met by the time specified.
- Outcome monitoring (the effect of terrestrial environmental pest plant control on the indigenous biodiversity of the Region) will be conducted in accordance with the Regional Monitoring Strategy.

8.4 Environmental Pest Plant Species to be Controlled

Table 8.1: Environmental pest plant species listed in this strategy. The management objective for each species is indicated.

Species Name	Zero-Density	Containment
Terrestrial		
Banana passionfruit *Passiflora* species (all banana passionfruit species)		✓
Blue-leaved wattle *Acacia saligna*	✓	
Blue passion flower *Passiflora caerulea*		✓
Boneseed (bitou bush) *Chrysanthemoides monilifera*		✓
Cathedral bells *Cobaea scandens*	✓	
Chilean rhubarb *Gunnera tinctoria, G. manicata* plus hybrids and varieties	✓	
Climbing spindleberry *Celastrus orbiculatus*	✓	
Contorta pine *Pinus contorta*		✓
Darwin's barberry *Berberis darwnii*		✓
Evergreen buckthorn *Rhamnus alaternus*		✓
Ginger Kahili ginger *Hedychium gardnerianum* Yellow ginger *Hedychium flavescens*	✓	
Grey willow *Salix cinerea*		✓
Heather *Calluna vulgaris*		✓
Knotweed Asiatic knotweed *Reynoutria japonica* Giant knotweed *Reynoutria sachalinensis*	✓	
Moth plant *Araujia sericifera*		✓
Old man's beard *Clematis vitalba*		✓

Species Name	Zero-Density	Containment
Aquatic		
Alligator weed *Alternanthera philoxeroides*	✓	
Californian bulrush *Schoenoplectus californicus*	✓	
Purple loosestrife *Lythrum salicaria*	✓	
Eelgrass *(Vallisneria sp.)* Hornwort *(Ceratophyllum demersum)* Egeria (oxygen weed) *(Egeria densa)* Lagarosiphon (oxygen weed) *(Lagarosiphon major)* Reed sweet grass *(Glyceria maxima)*		✓

banana passionfruit

Passiflora species[6]

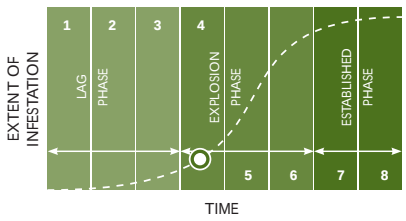
REASON FOR INCLUSION

Banana passionfruit can smother forest canopies (up to 10 m high) and topple shallow-rooted trees.

The vine can also suppress indigenous regeneration. Banana passionfruit can invade forest, margins, secondary forest as well as windbreaks, plantations, roadsides and wasteland.

DESCRIPTION

- Banana passionfruit is a large, vigorous, scrambling, evergreen vine with clinging tendrils.
- The leaves are toothed and three-lobed.
- The flowers are large (up to 7 cm in diameter), pink and tubular.
- Banana passionfruit flowers in winter-spring.
- The fruit are yellow when ripe, up to 12 cm long, cylindrical with a sweet-flavoured orange pulp surrounding seeds.



DISTRIBUTION

- There are substantial infestations in the western and central parts of the Region, while some areas are relatively clear.
- Banana passionfruit infestations are scattered over approximately 1,300 ha, although the infestations are rapidly increasing in density.

'Weediness' score:	27
Practicality score:	3
Unwanted Organism?	yes

Impact evaluation for banana passionfruit in the Manawatu-Wanganui Region.

Area and Extent of Effect	Disturbed, secondary forests and forest margins	Shrublands	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓			✓	✓ especially secondary forest
Potential		✓	✓		

[6] Includes all species and varieties of banana passionfruit but excludes black passionfruit (*Passiflora edulis*).

MANAGEMENT REGIME FOR BANANA PASSIONFRUIT

OBJECTIVE

Containment

AIM

To control to zero-density banana passionfruit within the Control Area by 2017 (Year10).

MEANS OF DELIVERY

Horizons will undertake direct control of banana passionfruit only within the Control Area (figure 8.1).

In situations where an occupier opposes the control methods used by Horizons, those occupiers will become responsible for the control to Zero-density of all banana passionfruit on their properties to the standard set by Horizons' staff. Horizons will meet the cost of this control to the amount of that incurred by Horizons' preferred method. Any costs additional to this will be met by the occupier. Horizons will help with advice on how to control and dispose of plants using different methods, even if such methods require more follow-up or take longer to be successful.

Roading authorities will be responsible for the control of all banana passionfruit infestations within the Control Area where they occur within the road corridor.

Horizons will not conduct control of banana passionfruit outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to banana passionfruit, but rather focus on all pest management issues.

MANAGEMENT REGIME FOR BANANA PASSIONFRUIT

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Bi-annual site visits will occur thereafter. Banana passionfruit will be monitored in accordance with section 6.2.5.

Evaluation:

Post August 2012, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Increasing the Control Area:

Should the infestations of banana passionfruit within the Control Area be successfully managed to Zero-density within the life of this Strategy, widespread control can commence within the Containment Area. Any such control will be systematic and work towards concentrically increasing banana passionfruit control throughout the Region and thus decreasing the size of the Containment Area.

Control will only commence outside the Control Area when there is a reliable record of infestations being reduced to Zero-density throughout the entire Control Area.

Any new work embarked on during the life of this Strategy will be subject to monitoring and reporting requirements as per this Strategy, and will be conducted within yearly allocated budgets.

Enforcement:

Where occupiers choose to undertake control work themselves, Horizons' staff will enforce the Zero-density objective on occupiers. Where required, Horizons' staff will issue a Request to Clear notice and subsequently follow the enforcement procedure as outlined in section 6.2.3.

Horizons will enforce control of banana passionfruit where it occurs in all road reserves within the Control Area.

Advocacy:

Horizons will incorporate banana passionfruit into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons may implement a targeted awareness campaign that focuses on banana passionfruit.

Horizons may solicit the public for distributional information of banana passionfruit within private gardens.

Advice and Information:

Horizons will provide advice and information on banana passionfruit to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Banana passionfruit is controlled to Zero-density within the Control Area.

Banana passionfruit infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of banana passionfruit.

STRATEGY RULES

Strategy Rule	Explanation
8.5.1.1	Where the occupier of a place is opposed to control being undertaken by authorised Horizons' staff, the occupier shall within 21 calendar days of being notified of the presence of banana passionfruit destroy all banana passionfruit species located in the place they occupy.
8.5.1.2	Where an occupier of a place fails to comply with rule 8.5.1.1, authorised Horizons' staff may destroy all identified banana passionfruit species located in that place.
8.5.1.3	Every roading authority shall not less than once every calendar year identify the presence of banana passionfruit where it occurs within the road reserve as defined in section 5.4 within the banana passionfruit Control Area. All banana passionfruit identified shall be destroyed. Every roading authority shall destroy any banana passionfruit within the banana passionfruit Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate banana passionfruit (all banana passionfruit *Passiflora* species and varieties). **A breach of this rule will create an offence under section 154 (m) of the Act.**

Figure 8.1: Map of the Manawatu-Wanganui Region showing the banana passionfruit Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.5.2

blue-leaved wattle

Acacia saligna

REASON FOR INCLUSION

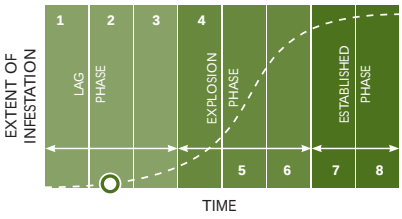
Blue-leaved wattle is a weed in South Africa of the same magnitude as the silver and black wattles.

The species has the potential to be particularly invasive in areas with an average yearly rainfall of 700-12,00 mm (ie the Wanganui hillcountry).The species has the potential to invade riparian margins and form dense canopies that exclude indigenous species.

As this species still has a very restricted distribution and poses a high risk, a Zero-density objective is justified.

DESCRIPTION

- Variable shrub or tree growing to 2-20 m tall.
- The trunk can be single or multi stemmed.
- Leaves are long and narrow.
- Bright yellow flowers are produced in large heads on the ends of branches.
- The trees can sucker and have a strong coppicing ability.



DISTRIBUTION

- Blue-leaved wattle is currently known only from Durie Hill in Wanganui City, which is the only known location in New Zealand.

'Weediness' score:	unclassified
Practicality score:	8
Unwanted Organism?	no

Impact evaluation for blue-leaved Wattle in the Manawatu-Wanganui Region.

Area and Extent of Effect	Disturbed forest habitats and scrubland	Riparian margins	Threatened species (or habitats of threatened species)	Hillcountry	Amenity and recreational values	Transformer species?
Current						
Potential	✓	✓	✓	✓	✓	✓

MANAGEMENT REGIME FOR BLUE-LEAVED WATTLE

OBJECTIVE

Zero-density

AIM

Reduce all populations of blue-leaved wattle in the Region to Zero-density by 2009 (Year 2).

MEANS OF DELIVERY

Horizons will undertake direct control.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Blue-leaved wattle will be monitored in accordance with Section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by blue-leaved wattle. Newly discovered infestations will be subject to management objectives as per this Strategy.

Evaluation:

Post-August 2008, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for blue-leaved wattle will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advocacy:

Horizons will incorporate blue-leaved wattle into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons may implement a targeted awareness campaign that focuses on blue-leaved wattle.

Advice and Information:

Horizons will provide advice and information on blue-leaved wattle to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Blue-leaved wattle is maintained at Zero-density throughout the Region.

Blue-leaved wattle infestations are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate blue-leaved wattle *(Acacia saligna).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

blue passion flower

Passiflora caerulea

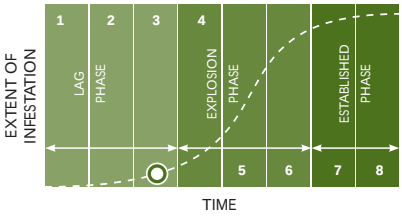
8.5.3

REASON FOR INCLUSION

Blue passion flower is capable of causing damage by smothering shrubs and canopy trees. It can grow in coastal shrublands, lowlands, forest margins and waste areas.

DESCRIPTION

- Blue passion flower is a hairless vine with angular shoots, five lobed leaves.
- Purple-white flowers are produced from December-April.



DISTRIBUTION

- Blue passion flower is currently at low infestations within the Region, known only from Wanganui City and in the vicinity of Levin.
- The number of residential gardens in which blue passion flower grows in is currently unknown.

'Weediness' score:	27
Practicality score:	6
Unwanted Organism?	no

Impact evaluation for blue passion flower in the Manawatu-Wanganui Region.

Area and Extent of Effect	Coastal shrublands and scrub	Disturbed, secondary forests and forest margins	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓				
Potential		✓	✓	✓	✓

MANAGEMENT REGIME FOR BLUE PASSION FLOWER

OBJECTIVE

Containment

AIM

To control to Zero-density all blue passion flower within the Control Area by 2011 (Year Four).

MEANS OF DELIVERY

Horizons will undertake direct control of blue passion flower only within the Control Area (figure 8.2).

Roading authorities will be responsible for the control of all blue passion flower infestations within the Control Area where they occur within the road corridor.

Horizons will not conduct control of blue passion flower outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to blue passion flower, but rather focus on all pest management issues.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Blue passion flower will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2010, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons will incorporate blue passion flower into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons may implement a targeted awareness campaign that focuses on blue passion flower.

Advice and Information:

Horizons will provide advice and information on blue passion flower to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Blue passion flower is controlled to Zero-density within the Control Area.

Blue passion flower infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of blue passion flower.

STRATEGY RULES	
Strategy Rule	Explanation
8.5.3.1	Every roading authority shall not less than once every calendar year identify the presence of blue passion flower where it occurs within the road reserve as defined in Section 5.4 within the blue passion flower Control Area. All blue passion flower identified shall be destroyed. Every roading authority shall destroy any blue passion flower within the blue passion flower Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate blue passion flower *(Passiflora caerulea).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

Figure 8.2: Map of the Manawatu-Wanganui Region showing the blue passion flower Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.5.4

boneseed

(bitou bush) *Chrysanthemoides monilifera*

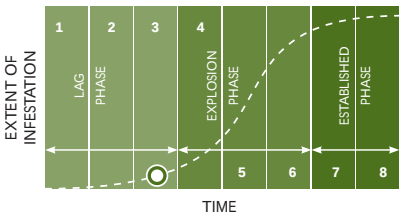
REASON FOR INCLUSION

Boneseed is an aggressive coloniser and competes with indigenous species, especially in coastal areas, and is very tolerant of draught.

It is spread by birds and is rapidly becoming a serious environmental weed and a nuisance to forestry. Boneseed can maintain a canopy and exclude other plants. It may also grow in forest margins and wasteland.

DESCRIPTION

- Boneseed is a perennial shrub growing to 3 m.
- Stems are woody with many branches.
- Leaves are bright to dark green, alternate, toothed and practically hairless.
- The flowers are bright yellow, daisy-like, with 8-12 petals clustered at the ends of the branches.
- Boneseed flowers in September-February. Unlike most members of the daisy family boneseed produces black coloured berries, which are spread by birds.



DISTRIBUTION

- Boneseed is scattered over approximately 4,500 ha.
- Infestations are concentrated mainly from the Wanganui area south to Turakina.

'Weediness' score:	28
Practicality score:	4
Unwanted Organism?	yes

Impact evaluation for boneseed in the Manawatu-Wanganui Region.

Area and Extent of Effect	Coastal cliffs	Dune systems and coastal areas	Shrublands and forest margins	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current		✓				✓ dunes, coastal cliffs
Potential	✓		✓	✓	✓	

MANAGEMENT REGIME FOR BONESEED

OBJECTIVE

Containment

AIM

To control to Zero-density all boneseed **within** the Control Area by 2012 (Year 5) (medium-term).

MEANS OF DELIVERY

Horizons will undertake direct control of boneseed only within the Control Area (figure 8.3).

Roading authorities will be responsible for the control of all boneseed infestations within the Control Area where they occur within the road corridor.

TOOLS

Enforcement:

Horizons will enforce control of boneseed where it occurs in all road reserves within the Control Area.

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Boneseed will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2011, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons will incorporate boneseed into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons may implement a targeted awareness campaign that focuses on boneseed.

Advice and Information:

Horizons will provide advice and information on boneseed to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Boneseed is controlled to Zero-density within the Control Area.

Boneseed infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of boneseed.

STRATEGY RULES

Strategy Rule	Explanation
8.5.4.1	Every roading authority shall not less than once every calendar year identify the presence of boneseed where it occurs within the road reserve as defined in section 5.4 within the boneseed Control Area. All boneseed identified shall be destroyed. Every roading authority shall destroy any boneseed within the boneseed Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate boneseed *(Chrysanthemoides monilifera).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

Figure 8.3: Map of the Manawatu-Wanganui Region showing the boneseed Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.5.5

cathedral bells

Cobaea scandens

REASON FOR INCLUSION

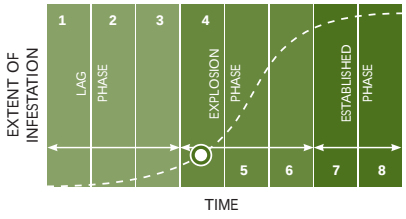
Cathedral bells is very fast-growing with dense growth habitat that carpets the understorey and can smother canopy trees.

Cathedral bells can suppress native plant regeneration in disturbed or low forest, forest margins and open coastal forest. The climber has the potential to become a major problem in forests, scrub and recreation areas and has the ability to invade habitats of endangered species, either displacing them or their food sources.

Cathedral bells is currently at infestation levels that, although difficult, can be managed to Zero-density within the Region.

DESCRIPTION

- Cathedral bells is a vigorous perennial climber with leaflets in three pairs.
- Leaflets are dark green above, whitish underneath, with a brown stalk ending in a twining tendril.
- Flowers are bell-shaped, green at first, becoming purple after pollen production.
- Flowers appear in summer/autumn.
- Egg-shaped capsules bear many large winged seeds.



DISTRIBUTION

- Cathedral bells is currently present at 20 sites.
- An estimated 10 ha is currently infested.

'Weediness' score:	30
Practicality score:	6
Unwanted Organism?	yes

Impact evaluation for cathedral bells in the Manawatu-Wanganui Region.

Area and Extent of Effect	Disturbed forest habitats and scrubland	Coastal forest	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓			✓	✓ especially in secondary forest
Potential		✓	✓		

MANAGEMENT REGIME FOR CATHEDRAL BELLS

OBJECTIVE

Zero-density

AIM

Reduce all currently known populations of cathedral bells in the Region to Zero-density by 2011 (Year 4).

MEANS OF DELIVERY

Horizons will undertake direct control.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Cathedral bells will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by cathedral bells. Newly discovered infestations will be subject to management objectives as per this Strategy.

Evaluation:

Post-August 2009, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for cathedral bells will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advocacy:

Horizons will incorporate cathedral bells into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons may implement a targeted awareness campaign that focuses on cathedral bells.

Advice and Information:

Horizons will provide advice and information on cathedral bells to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Cathedral bells is maintained at Zero-density throughout the Region.

Infestations of cathedral bells are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate cathedral bells (*Cobaea scandens*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

Chilean rhubarb

(giant rhubarb) *Gunnera* species[7]

8.5.6

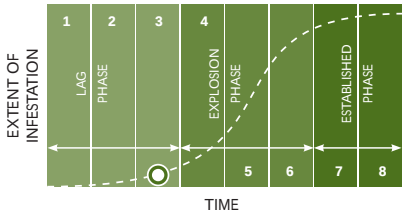
REASON FOR INCLUSION

Chilean rhubarb is just starting to spread but is currently at an early stage of invasion (Williams et al., 2005).

Chilean rhubarb has the potential to invade the bluffs of all steep wet incised river cliffs in the Region and is already present on inland cliffs in the Pohangina Valley. Chilean rhubarb has become aggressively invasive in the Taranaki Region, forming dense stands and excluding indigenous species, spreading along coastal cliffs and invading pastoral drains.

DESCRIPTION

- Giant, clump-forming, summer-green herb.
- Leaves are large (c.80 x 100 cm), growing to c. 2.5 m tall, and are rhubarb-like.
- Soft prickles are present on the main veins of leaves.
- Small greenish flowers in October-November on a tall (to 1 m long at fruiting) panicle arising from the base of the leaf stalks.
- Each panicle produces thousands of small reddish fruits (1.5 mm-2 mm long) which have a very high viability.



DISTRIBUTION

- Chilean rhubarb is currently present in parks, botanic gardens and large private gardens and in the wild along streams and drains.
- Current presence is estimated at 20 ha.

'Weediness' score:	30 *(G.tinctoria)*
Practicality score:	5
Unwanted Organism?	yes *(G.tinctoria)*

Impact evaluation for Chilean rhubarb in the Manawatu-Wanganui Region.

Area and Extent of Effect	Coastal cliffs	Inland cliffs	Wetland/ riparian margins	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current		✓	✓			✓
Potential	✓		✓	✓	✓	

[7] All giant Gunnera complexes/hybrids including *Gunnera tinctoria* and *G. manicata* are covered by this Strategy.

MANAGEMENT REGIME FOR CHILEAN RHUBARB

OBJECTIVE

Zero-Density

AIM

Reduce all currently known populations of Chilean rhubarb in the Region to Zero-density by 2010 (Year 3).

Control any newly discovered populations of Chilean rhubarb to Zero-density as Horizons becomes aware of them.

MEANS OF DELIVERY

Horizons will undertake direct control.

In situations where an occupier opposes the control methods used by Horizons, that occupier will become responsible for the control to Zero-density of all Chilean rhubarb on their property to the standard set by Horizons' staff. Horizons will meet the cost of this control to the amount of that incurred by Horizons' preferred method. Any costs additional to this will be met by the occupier. Horizons will help with advice on how to control and dispose of plants using different methods, even if such methods require more follow-up or take longer to be successful.

MANAGEMENT REGIME FOR CHILEAN RHUBARB

TOOLS

Enforcement:

Where occupiers choose to undertake control work themselves, Horizons' staff will enforce the Zero-density objective on occupiers. Where required Horizons' staff will issue a Request to Clear notice and subsequently follow the enforcement procedure as outlined in section 6.2.3.

Monitoring:

Horizons will conduct success monitoring during the course of control, and, outside of private gardens, continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Chilean rhubarb will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by Chilean rhubarb. Newly discovered infestations will be subject to management objectives as per this Strategy. Members of the public will be encouraged to report locations of Chilean rhubarb.

Evaluation:

Post-August 2009, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for Chilean rhubarb will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advocacy:

The success of this programme will be heavily dependent on efficient advocacy. Chilean rhubarb (and all other giant-leaved *Gunnera* species) will be the focus of a targeted awareness campaign. This campaign will emphasise the threat to the Region posed by Chilean rhubarb and explain Horizons' management Strategy.

Horizons will seek assistance from landowners in identifying where Chilean rhubarb is present in private gardens.

Horizons will incorporate Chilean rhubarb into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons will work with garden nurseries and plant retailers to discourage the sale of all other giant-leaved *Gunnera* varieties.

Advice and Information:

Horizons will provide advice and information on Chilean rhubarb to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Chilean rhubarb is maintained at Zero-density throughout the Region.

The range of Chilean rhubarb is restricted to that outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
8.5.6.1	Where the occupier of a place is opposed to control being undertaken by authorised Horizons' staff, the occupier shall within 21 calendar days of being notified of the presence of Chilean rhubarb destroy all Chilean rhubarb species located in the place they occupy.
8.5.6.2	Where an occupier of a place fails to compily with rule 8.5.6.1, authorised Horizons' staff may destroy all identified Chilean rhubarb species located in that place. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate Chilean rhubarb (*Gunnera tinctoria, G. manicata* and all giant leaved hybrids and complexes). **A breach of this rule will create an offence under section 154 (m) of the Act.**

climbing spindleberry

Celastrus orbiculatus

8.5.7

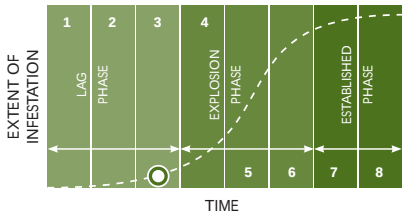
REASON FOR INCLUSION

Climbing spindleberry is known to be aggressively invasive and seedlings are shade tolerant.

It can suppress indigenous species by smothering forest canopies and can prevent indigenous regeneration by forming dense mats. It has also become a considerable commercial forest pest plant near Taupo, causing damage to forestry trees. The climber has the potential to displace threatened species or threaten the habitats of threatened species. Climbing spindleberry was a 'Regional Surveillance' plant in the previous RPPMS and Horizons now considers that the plant poses a considerable threat to the Region and is currently at infestation levels were a Zero-density objective is achievable.

DESCRIPTION

- A deciduous hairless climber that can grow to at least 12 m tall.
- Leaves are arranged alternately on the stem and may be almost round to elliptic in shape and are conspicuous in autumn when they turn a bright yellow colour before dropping.
- Flowers are green and inconspicuous, and appear in October-December.
- Fruit are showy and yellow, opening to expose a scarlet centre, and are present from May onwards, often still present once the leaves have fallen.



DISTRIBUTION

- Climbing spindleberry currently infests an estimated 110 ha.

'Weediness' score:	32
Practicality score:	7
Unwanted Organism?	yes

Impact evaluation for climbing spindleberry in the Manawatu-Wanganui Region.

Area and Extent of Effect	Regeneration forest, scrub and intact forest margins	Threatened species (or habitats of threatened species)	Amenity and recreational values	Commercial pine plantation	Transformer species?
Current	✓				✓ especially secondary forest
Potential		✓	✓	✓	

MANAGEMENT REGIME FOR CLIMBING SPINDLEBERRY

OBJECTIVE

Zero-Density

AIM

Reduce all currently known populations of climbing spindleberry in the Region to Zero-density by 2011 (Year 4).

MEANS OF DELIVERY

Horizons will undertake direct control.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Climbing spindleberry will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by climbing spindleberry. Newly discovered infestations will be subject to management objectives as per this Strategy.

Evaluation:

Post-August 2009, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-Density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for climbing spindleberry will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advocacy:

Horizons will incorporate climbing spindleberry into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons may implement a targeted awareness campaign that focuses on climbing spindleberry.

Advice and Information:

Horizons will provide advice and information on climbing spindleberry to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Climbing spindleberry is maintained at Zero-density throughout the Region.

Climbing spindleberry infestations are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate climbing spindleberry *(Celastrus orbiculatus)*. **A breach of this rule will create an offence under section 154 (m) of the Act.**

8.5.8

Contorta pine

Pinus contorta subsp. *contorta*
Pinus contorta subsp. *murrayana*

REASON FOR INCLUSION

Although the known population of contorta pine sits at the high end of the Infestation Curve, the extreme risk of this species justifies the intensity of management. Contorta pine poses a substantial threat across the Volcanic Plateau, especially in Tongariro National Park where it has been controlled for over 40 years. Contorta pine is a transformer weed in low-stature habitat such as tussock and alpine.

Contorta pine can also invade ungrazed land and can compete vigorously with commercial species within plantation forests.

Contorta pine has been (or will be) reduced in density under the current Strategy to populations where Horizons can now afford to assist landowners with control. Intervention by Horizons will complement the sustained management programmes of the other land management agencies operating on the Volcanic Plateau (eg DOC, NZDF and forestry companies). The biodiversity outcome sought is considered by Horizons to justify intervention by Horizons.

The regional focus for management of contorta pine is protection of the Volcanic Plateau and the maintenance of a buffer around the Ruahine and Tararua Ranges.

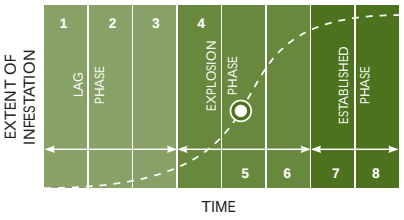
DESCRIPTION

- A two-needled conifer capable of growing to 25 m, but also commonly stunted in growth with twisted branches.
- The species produces small green cones with a rough exterior after about four or five years. The cones remain closed for long periods of time before bursting open to release the fertile seeds.
- Seed dispersal is mainly by wind, with seed travelling up to 30 km from the parent plant, although most seed falls within 100 m of the parent plant.
- Contorta pine can grow in a wide range of habitats.

'Weediness' score:	30
Practicality score:	3
Unwanted Organism?	yes

DISTRIBUTION

- Contorta pine is widespread in the Region with populations concentrated in the north.



Impact evaluation for contorta pine in the Manawatu-Wanganui Region.

Area and Extent of Effect	Tussocklands, subalpine and alpine habitats	Forest margins and shrubland	Production forests	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓	✓	✓	✓	✓	✓ all low stature habitats
Potential						

MANAGEMENT REGIME FOR CONTORTA PINE

OBJECTIVE

Containment

AIM

To control contorta pine within the Control Area (figure 8.4) by 2012 (Year 5), and prevent invasion into the Ruahine and Tararua Ranges.

Initial knock down of populations of contorta pine as directed under Horizons Regional Plant Pest Management Strategy (2001) is completed by 2007, with the exception of infestations on land occupied by those bound under Rules 8.5.8.2 -8.5.8.8 of this Strategy.

To establish an interagency strategy for management of contorta pine on the Volcanic Plateau.

MEANS OF DELIVERY

Occupiers holding responsibility for control of current infestations of contorta pine on their property as determined by the RPPMS (2001) will continue to fulfil this responsibility under this Strategy. All contorta pine on these properties is required to be under sustained control (three-year rotation)[8] with a long-term goal of Zero-density.

Horizons will undertake sustained direct control of contorta pine on private rateable land[19] within the Control Area (figure 8.4), with a focus on preventing further spread. This control will include new seedlings on land bound under the RPPMS (2001) once the landowner has fulfilled their requirements under that RPPMS as required under rule 8.5.8.1.

Horizons will undertake control but will not be responsible for site clean-up, landscaping or replacement of trees.

The New Zealand Defence Force (NZDF) has chosen to control contorta pine, and is therefore responsible for maintaining sustained control (three-year rotation) of contorta pine wherever it occurs on land occupied by the NZDF.

The Department of Conservation (DOC) has chosen to control contorta pine on the Volcanic Plateau, and is therefore responsible for maintaining sustained control (three-year rotation) of contorta pine wherever it occurs on land it occupied by DOC.

The occupier of Karioi Forest are responsible for maintaining sustained control (three-year rotation) of contorta pine wherever it occurs in Karioi Forest.

Roading authorities will be responsible for the control of contorta pine infestations within the Control Area where they occur within the road corridors.

Horizons will not conduct control of contorta pine outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to contorta pine, but rather focus on all pest management issues.

8 A three-year rotation regime involves initial control in year one with follow-up control at three yearly intervals thereafter.

9 A privately owned property that supplies the majority of the household's income.

MANAGEMENT REGIME FOR CONTORTA PINE

TOOLS

Enforcement:

Horizons will enforce control of contorta pine on all occupiers of properties subject to the rules of the Regional Plant Pest Management Strategy (2001) and follow the enforcement procedure (section 6.2.3) until this requirement has been fulfilled.

Horizons will enforce control of contorta pine on all occupiers of areas of commercial forestry within the Volcanic Plateau.

Horizons will enforce control of contorta pine where it occurs in all road reserves within the Control Area.

Memoranda of Understanding (MOU):

Horizons will maintain and enhance relationships with the key land management agencies on the Volcanic Plateau. MOUs can incorporate other species and allow for creative sharing of resources where responsibilities and outcomes are agreed on. MOUs will stipulate the requirement for control of contorta pine to be under sustained management (three-year rotations).

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Contorta pine will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2011, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons will incorporate contorta pine into advocacy programmes focused on the threats to and protection of the Volcanic Plateau. Horizons will undertake collaborations with other agencies. Horizons may implement a targeted awareness campaign that focuses on contorta pine.

Advice and Information:

Horizons will provide advice and information on contorta pine to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Contorta pine is controlled to Zero-density within the Control Area, and is controlled in conjunction with the other key agencies involved in land management on the Volcanic Plateau.

A coherent strategic approach for management of contorta pine across the Volcanic Plateau, which will result in protection of the natural values within this habitat.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of contorta pine.

STRATEGY RULES

Strategy Rule	Explanation
8.5.8.1	All occupiers (with the exception of those bound under rules 8.5.8.2-8.5.8.8 of this Strategy) bound under Horizons Regional Plant Pest Management Strategy (2001) remain subject to the rule defined in that Strategy (section 9.5.3. (b)) Whereby: "The occupier is required to remove all seeding trees of *Pinus contorta* within the next five years (ie. by August 2006) in the areas designated in figure 4, on land that he or she occupies".
8.5.8.2	The occupier of the Karioi Forest must (i) within one year of this Strategy becoming operative destroy all species of *Pinus contorta* subsp. *contorta* (green contorta) from the Karioi Forest Seed Source Areas (ii) following compliance with Rule 8.5.8.2 (i) inspect the Karioi Forest Seed Source Areas every three calendar years for contorta pine (green and yellow). All contorta pine (green and yellow) found shall be destroyed.
8.5.8.3	The occupier of the Karioi Forest must (i) destroy all contorta pine (green and yellow) in the Karioi Forest Mixed Species Plantation Area at the time of harvest. (ii) following compliance with Rule 8.5.8.3 (i) inspect the Karioi Forest Mixed Species Plantation Area every three calendar years for contorta pine (green and yellow). All contorta pine (green and yellow) found shall be destroyed.
8.5.8.4	The occupier of the Karioi Forest must (i) destroy all contorta pine (green and yellow) within 30 metres of the boundary of the Karioi Forest Mixed Species Plantation Area within 5 years of this Strategy becoming operative (ii) following compliance with Rule 8.5.8.4 (i), the area within 30 metres of the boundary of the Karioi Forest Mixed Species Plantation Area will be inspected every three calendar years and all contorta pine (green and yellow) present within this area destroyed (iii) monitor the area within the Karioi Forest Balance Area immediately adjacent to the area detailed in Rule 8.5.8.4 (ii) for seedlings of contorta pine (green and yellow) to determine the effectiveness of Rule 8.5.8.5 (ii).

STRATEGY RULES

Strategy Rule	Explanation
8.5.8.5	The occupier of the Karioi Forest must (i) within five years of this strategy becoming operative complete initial destruction of all contorta pine (green and yellow) in the Karioi Forest Balance Area (ii) to give effect to Rule 8.5.8.5 (i) the occupier of the Karioi Forest must destroy annually not less than 20% of the total contorta pine (green and yellow) infestation where it occurs within the Karioi Forest Balance Area with the exception of areas of contorta pine infestation which falls under other rules of this Strategy (iii) following compliance with Rule 8.5.8.5 (i) the occupier of Karioi Forest must inspect the area of the Karioi Forest Balance Area subject to contorta pine (green or yellow) control as described in Rule 8.5.8.5 (i) every three calendar years for contorta pine (green and yellow). All contorta pine (green and yellow) found shall be destroyed.
8.5.8.6	The occupier of the Karioi Forest shall provide Horizons with annual reports detailing how Rules 8.5.8.2-8.5.8.5 have been or are being complied with. The annual report shall (i) detail the physical area where destruction has been carried out (ii) detail the total area (in hectares) subject to ongoing management of contorta pine (iii) detail the methods of destruction of contorta pine employed within the areas detailed as required by Rule 8.5.8.5. (i) (iv) include results from monitoring conducted as per Rule 8.5.8.4 (iii).
8.5.8.7	The occupier of the Karioi Forest must at the request of Horizons produce documentation sufficient to demonstrate compliance with the rules in this strategy.
8.5.8.8	Every roading authority shall not less than once every calendar year identify the presence of contorta pine where it occurs within the road reserve as defined in section 5.4 within the contorta pine Control Area. All contorta pine identified shall be destroyed. Every roading authority shall destroy any contorta pine within the contorta pine Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate contorta pine *(Pinus contorta* subsp. *contorta, & Pinus contorta* subsp. *murrayana).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

Figure 8.4: Map of the Manawatu-Wanganui Region showing contorta pine Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

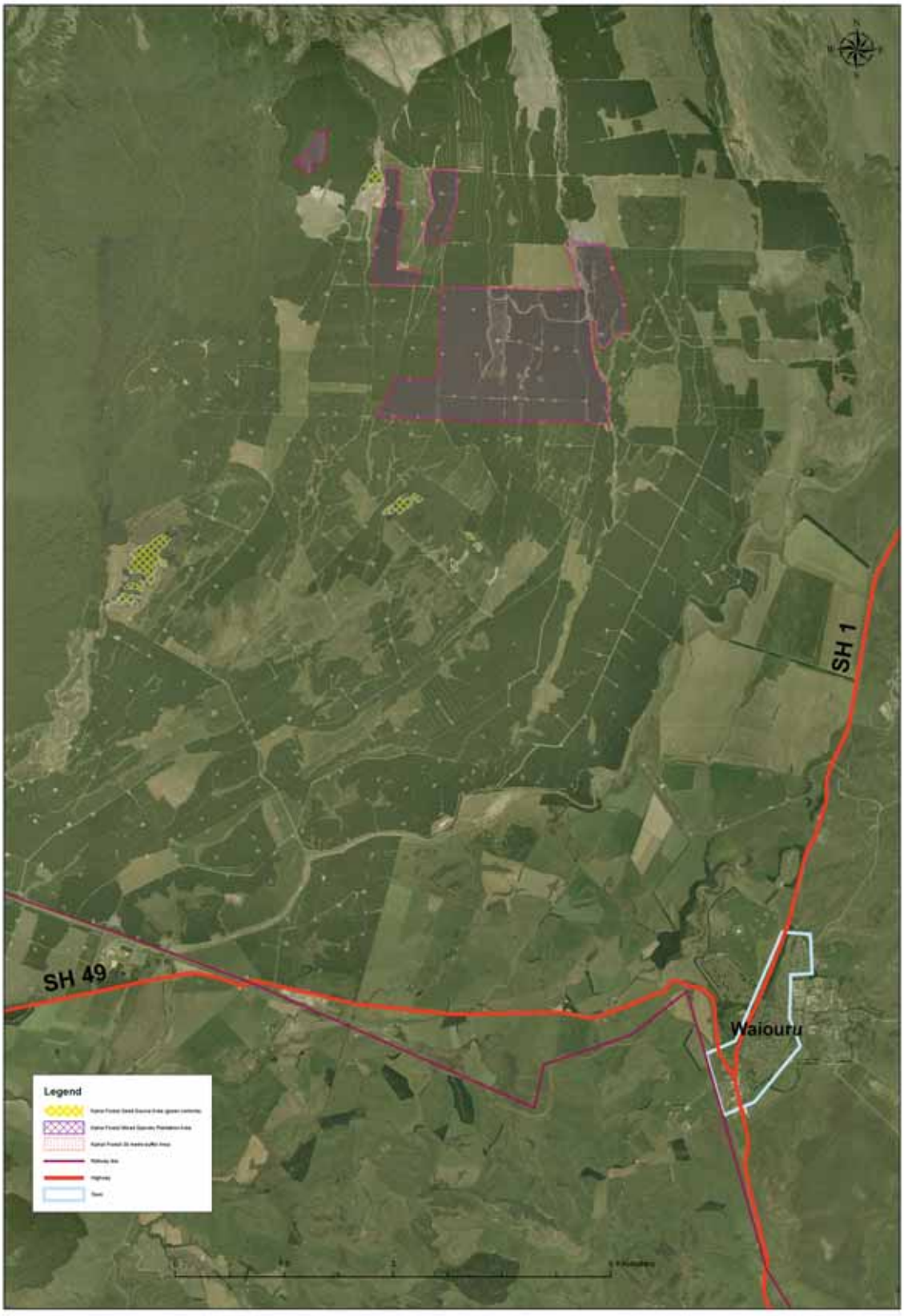


Figure 8.5: Map of Karioi Forest showing the Karioi Forest Seed Source Area, the Karioi Forest Mixed Species Plantation Area (central heavy infestation), and the 30-metre buffer as relate to the Strategy Rules (Section 8.5.8).

8.5.9

Darwin's barberry

Berberis darwinii

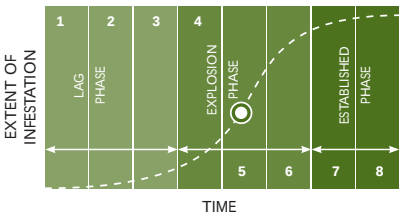
REASON FOR INCLUSION

Darwin's barberry can invade forest margins, and into light open forest (such as beech forest) where it can form impenetrable stands and prevent native regeneration. Darwin's barberry can also grow on generally steeper pasture where stock grazing is not so intensive. It can block access to infrastructure and can restrict access to recreational areas.

Darwin's barberry poses a considerable threat to the open, cold beech forest of the Volcanic Plateau as well as the Ruahine and Tararua Ranges. Control work will be focused on protecting Tongariro National Park, the Ruahine and Puketoi Ranges, and Pueora Forest Park.

DESCRIPTION

- Darwin's barberry is a spiny, thick stemmed woody evergreen shrub up to 4 m tall.
- The flowers are attractive, deep orange in colour, growing in simple drooping flower clusters up to 7 cm long.
- Darwin's barberry has dark purple berries with a bluish-white bloom.
- The small, shiny dark green holly-like leaves are alternate in clusters of three to five, together with five-pronged, needle-sharp spines.
- Darwin's barberry flowers in July-September although flowers can still be present in January.



DISTRIBUTION

- Darwin's barberry is widespread in the Region, with infestations concentrated in the north and in the Tararua District.
- Infestations of Darwin's barberry are scattered over an estimated 3,000 ha.

'Weediness' score:	26
Practicality score:	4
Unwanted Organism?	yes

Impact evaluation for Darwin's barberry in the Manawatu-Wanganui Region.

Area and Extent of Effect	Open, cold forests (eg beech forest)	Forest margins and shrubland	Wetland margins	Production land	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓	✓	✓	✓	✓	✓	
Potential							✓ may displace

MANAGEMENT REGIME FOR DARWIN'S BARBERRY

OBJECTIVE

Containment

AIM

To control to Zero-density all Darwin's barberry within the Control Area by 2014 (Year 7).

MEANS OF DELIVERY

Horizons will undertake direct control of Darwin's barberry only within the Control Area (figure 8.6).

Roading authorities will be responsible for the control of all Darwin's barberry infestations within the Control Area where they occur within the road corridor.

Horizons will not conduct control of Darwin's barberry outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (Section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to Darwin's barberry, but rather focus on all pest management issues.

TOOLS

Enforcement:

Horizons will enforce control of Darwin's barberry where it occurs in all road reserves within the Control Area.

Memorandum of Understanding:

Horizons will continue working with DOC to maintain a buffer around the Tongariro National Park. The scope of the current Memorandum of Understanding can increase to include protection from other species as the two agencies require.

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Darwin's barberry will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2012, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons may incorporate Darwin's barberry into advocacy programmes focused on the threats to, and protection of, the Volcanic Plateau. Horizons will enter collaborations with other agencies.

Horizons may implement a targeted awareness campaign that focuses on Darwin's barberry.

Advice and Information:

Horizons will provide advice and information on Darwin's barberry to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Darwin's barberry is controlled to Zero-density within the Control Area.

Darwin's barberry infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of Darwin's barberry.

STRATEGY RULES

Strategy Rule	Explanation
8.5.9.1	Every roading authority shall not less than once every calendar year identify the presence of Darwin's barberry where it occurs within the road reserve as defined in section 5.4 within the Darwin's barberry Control Area. All Darwin's barberry identified shall be destroyed. Every roading authority shall destroy any Darwin's barberry within the Darwin's barberry Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate Darwin's barberry *(Berberis darwinii)* **A breach of this rule will create an offence under section 154 (m) of the Act.**

Figure 8.6: Map of the Manawatu-Wanganui Region showing the Darwin's barberry Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.5.10

evergreen buckthorn

Rhamnus alaternus

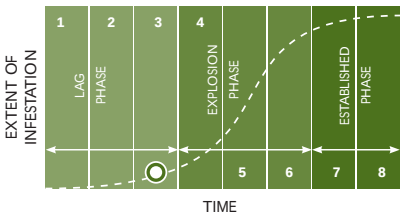
REASON FOR INCLUSION

Evergreen buckthorn has the ability to form dense colonies, smothering indigenous plants and preventing establishment of indigenous plants.

It can alter the structure of other indigenous forest ecosystems in a very short period of time. Evergreen buckthorn can pose a serious threat to coastal vegetation, competing strongly with indigenous coastal species, and can also restrict access to recreational areas. It also has the ability to colonise the margins of streams, forest margins and disturbed forests.

DESCRIPTION

- Evergreen buckthorn is an evergreen shrub that grows to 20 m.
- The leaves are leathery and glossy on the top surface, entire or with teeth that can be blunt or sharp.
- Evergreen buckthorn is dioecious, with the female and male plants being very distinct from each other.
- The flowers are green, small, fragrant, 3-4 mm in diameter, with no petals, forming a loose branching cluster.
- Fruit are small, dark red berries ripening to black and produced only on female plants.



DISTRIBUTION

- Evergreen buckthorn has spread from a house site near Wanganui into neighbouring bush areas and roadsides.
- The infestations are scattered over an estimated area of 3,000 ha.

'Weediness' score:	29
Practicality score:	4
Unwanted Organism?	yes

Impact evaluation for evergreen buckthorn in the Manawatu-Wanganui Region.

Area and Extent of Effect	Coastal cliffs and coastal forests	Dune systems and coastal areas	Shrublands and forest margins	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current		✓				✓ especially secondary forest
Potential	✓		✓	✓	✓	

MANAGEMENT REGIME FOR EVERGREEN BUCKTHORN

OBJECTIVE

Containment

AIM

To control to Zero-density all evergreen buckthorn within the Control Area by 2014 (Year 7).

Maintain a five-kilometre wide buffer around Wanganui City free of evergreen buckthorn.

MEANS OF DELIVERY

Horizons will undertake direct control of evergreen buckthorn only within the Control Area (figure 8.7).

Roading authorities will be responsible for the control of all evergreen buckthorn infestations within the Control Area where they occur within the road corridor.

Horizons will not conduct control of evergreen buckthorn outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to evergreen buckthorn, but rather focus on all pest management issues.

TOOLS

Enforcement:

Horizons will enforce control of evergreen buckthorn where it occurs in all road reserves within the Control Area.

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Evergreen buckthorn will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2012, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons will incorporate evergreen buckthorn into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons may implement a targeted awareness campaign that focuses on evergreen buckthorn.

Advice and Information:

Horizons will provide advice and information on evergreen buckthorn to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Evergreen buckthorn is controlled to Zero-density within the Control Area.

Evergreen buckthorn infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of evergreen buckthorn.

STRATEGY RULES

Strategy Rule	Explanation
8.5.10.1	Every roading authority shall not less than once every calendar year identify the presence of evergreen buckthorn where it occurs within the road reserve as defined in section 5.4 within the evergreen buckthorn Control Area. All evergreen buckthorn identified shall be destroyed. Every roading authority shall destroy any evergreen buckthorn within the evergreen buckthorn Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate evergreen buckthorn *(Rhamnus alaternus).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

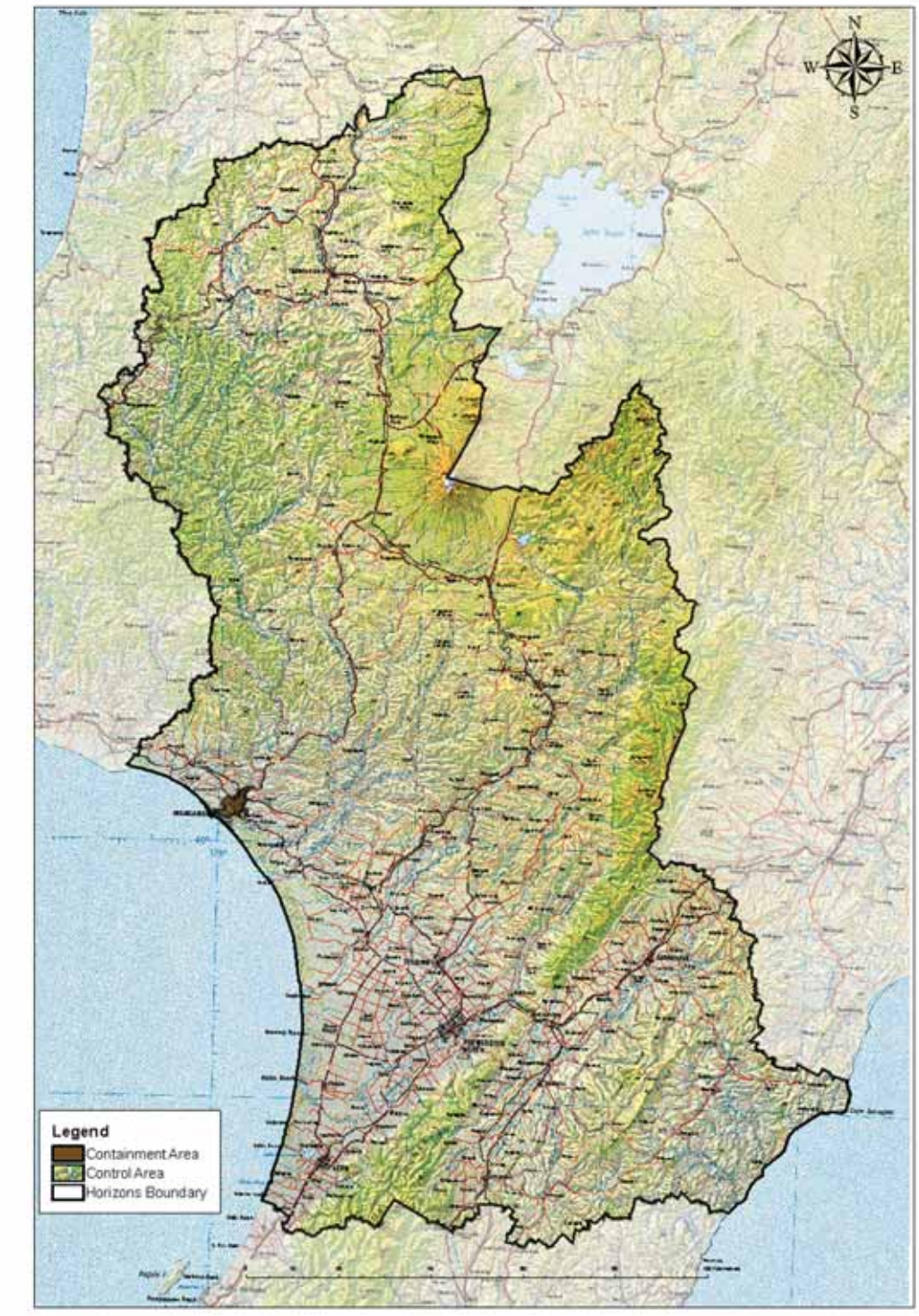


Figure 8.7: Map of the Manawatu-Wanganui Region showing the evergreen buckthorn Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.5.11

ginger

(kahili ginger) *Hedychium gardnerianum*
and (yellow ginger) *H. flavescens*

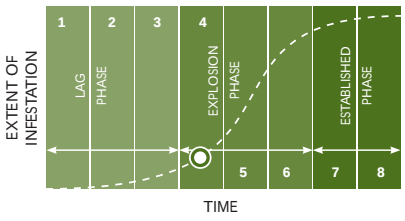
REASON FOR INCLUSION

Ginger matures quickly and can form dense stands that prevent native regeneration.

Ginger has the ability to invade and dominate in riparian margins and forests, especially disturbed secondary forest. Ginger can spread rapidly, having the ability to recover effectively following removal of top growth, and can also spread through detached rhizomes. The seed of ginger is spread by birds (kahili ginger) and rhizomes are spread by garden dumping.

DESCRIPTION

- The ginger species are giant fragrant, leafy, rhizomatous, perennial herbs.
- Kahili ginger will grow to around 2 m tall, with large conspicuous flowers in late summer, followed by scarlet seeds in capsules.
- Yellow ginger is somewhat taller, up to 3 m, with off-white to cream flowers in a cone-like inflorescence, with the bracts (modified leaves) strongly overlapping.
- Yellow ginger does not produce seed in New Zealand.



DISTRIBUTION

- Outside of private gardens, ginger is scattered throughout the Region covering an estimated 20 ha.

'Weediness' score (kahili ginger):	31
'Weediness' score (yellow ginger):	24
Practicality score:	4
Unwanted Organism?	no

Impact evaluation for ginger in the Manawatu-Wanganui Region.

Area and Extent of Effect	Coastal cliffs	Inland cliffs	Disturbed forest habitats	Wetland/ riparian margins	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current			✓	✓			
Potential	✓	✓			✓	✓	✓ especially secondary forest

MANAGEMENT REGIME FOR GINGER

OBJECTIVE

Zero-density

AIM

Reduce all currently known populations of ginger in the Region to Zero-density by 2011 (Year 4).

MEANS OF DELIVERY:

Horizons will undertake direct control.

In situations where an occupier opposes the control methods used by Horizons, those occupiers will become responsible for the control to Zero-density of all ginger on their properties to the standard set by Horizons' staff. Horizons will meet the cost of this control to the amount of that incurred by Horizons' preferred method. Any costs additional to this will be met by the occupier. Horizons will help with advice on how to control and dispose of plants using different methods, even if such methods require more follow-up or take longer to be successful.

MANAGEMENT REGIME FOR GINGER

TOOLS

Enforcement:

Where occupiers choose to undertake control work themselves, Horizons' staff will enforce the Zero-density objective on occupiers. Where required, Horizons' staff will issue a Request to Clear notice and subsequently follow the enforcement procedure as outlined in section 6.2.3.

Monitoring:

Horizons will conduct success monitoring during the course of control, and, outside of private gardens, continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Ginger will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by ginger. Newly discovered infestations will be subject to management objectives as per this Strategy. Members of the public will be encouraged to report locations of ginger.

Evaluation:

Post-August 2009, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for ginger will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advocacy:

The success of this programme will be heavily dependent on efficient advocacy. Ginger will be the focus of a targeted awareness campaign. This campaign will emphasise the threat to the Region posed by ginger and explain Horizons' management Strategy.

Horizons will seek assistance from landowners in identifying where ginger is present in private gardens.

Horizons will incorporate ginger into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Advice and Information:

Horizons will provide advice and information on ginger to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Ginger is maintained at Zero-density throughout the Region.

The range of ginger is restricted to that outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
8.5.11.1	Where the occupier of a place is opposed to control being undertaken by authorised Horizons' staff, the occupier shall within 21 calendar days of being notified of the presence of ginger destroy all ginger species located in the place they occupy.
8.5.11.2	Where an occupier of a place fails to comply with rule 8.5.11.1, authorised Horizons' staff may destroy all identified ginger species located in that place. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate ginger *(Hedychium gardnerianum and H. flavescens).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

8.5.12

grey willow

Salix cinerea

REASON FOR INCLUSION

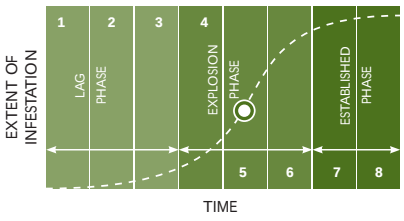
Grey willow is an aggressive invader in wetlands, spreading rapidly to become the dominant vegetation, changing the composition of wetland habitat and interrupting ecological processes.

Grey willow can impede water flow and increase the negative effects of flooding.

Grey willow is a particular threat to the Volcanic Plateau wetlands and control work will focus on protecting these areas.

DESCRIPTION

- Grey willow is a small deciduous tree growing to 7 m but often only 1-2 m.
- The leaves are shiny above and covered with soft grey hairs beneath.
- Grey willow is dioecious, with male and female trees distinct from each other.
- Catkins appear on the stems in spring before the leaves develop.
- Grey willow favours swampy areas and riverbanks, although will grow in a wide range of habitats up to 1400 m asl.
- Grey willow hybridises easily.



DISTRIBUTION

- Grey willow is expanding its range throughout the Region and spreading into wetlands and alpine habitats.
- Grey willow is present over an estimated 51,000 ha.

'Weediness' score:	32
Practicality score:	6
Unwanted Organism?	yes

Impact evaluation for grey willow in the Manawatu-Wanganui Region.

Area and Extent of Effect	Wetlands	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓	✓	✓	✓ wetlands
Potential				

MANAGEMENT REGIME FOR GREY WILLOW

OBJECTIVE

Containment

AIM

To control to Zero-density all grey willow within the Control Area by 2014 (Year 7).

MEANS OF DELIVERY:

Horizons will undertake direct control of grey willow only within the Control Area (Figure 8.8) within wetland habitat, or where it threatens wetland habitat, with a focus on preventing spread of grey willow in the Volcanic Plateau wetlands.

Horizons will not conduct control of grey willow outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (Section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to grey willow, but rather focus on all pest management issues.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further two years. Biennial site visits will occur thereafter. Grey willow will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2013, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons may implement a targeted awareness campaign that focuses on grey willow.

Advice and Information:

Horizons will provide advice and information on grey willow to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Grey willow is controlled to Zero-density within the Control Area.

Grey willow infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of grey willow.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate grey willow *(Salix cinerea).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

Figure 8.8: Map of the Manawatu-Wanganui Region showing the grey willow Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.5.13

heather

Calluna vulgaris
(excluding double-flowered hybrids)

REASON FOR INCLUSION

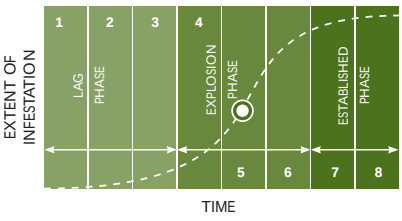
Heather poses a significant threat to the ecological and recreational values of the Region.

Heather can out-compete and displace indigenous species particularly in low stature habitats such as tussockland and associated alpine ecosystems. Heather also impairs recreational enjoyment and the use of Army training land in the Region. Heather also has potential to invade marginal production land.

There are still significant areas free of heather and it is important to protect these areas and ecosystems if possible.

DESCRIPTION

- A woody, evergreen perennial shrub growing to c. 1.5m tall.
- Small stalkless leaves grow in four vertical rows on the branches.
- Leaves are dark green and turn brown as the plant matures.
- Heather produces small pale purple bell-shaped flowers in summer.



DISTRIBUTION

- Heather is widespread across the Volcanic Plateau including the western side of Tongariro National Park.
- Heather occupies an estimated 103,000 ha within the Region.

'Weediness' score:	27
Practicality score:	4
Unwanted Organism?	yes

Impact evaluation for heather in the Manawatu-Wanganui Region.

Area and Extent of Effect	Tussockland/alpine ecosystems	Production (pastoral) land	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓	✓		✓	
Potential			✓		

MANAGEMENT REGIME FOR HEATHER

OBJECTIVE

Containment

AIM

To control to Zero-density all heather within the Control Area by 2011.(Year 4).

MEANS OF DELIVERY

Horizons will undertake direct control of heather only within the Control Area (figure 8.9).

Roading authorities will be responsible for the control of all heather infestations within the Control Area where they occur within the road corridor.

Horizons will not conduct control of heather outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to heather, but rather focus on all pest management issues.

TOOLS

Enforcement:

Horizons will enforce control of heather where it occurs in all road reserves within the Control Area.

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further three years. Biennial site visits will occur thereafter. Heather will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2009, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons may implement a targeted awareness campaign that focuses on heather.

Advice and Information:

Horizons will provide advice and information on heather to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Heather is controlled to Zero-density within the Control Area.

Heather infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of heather.

STRATEGY RULES

Strategy Rule	Explanation
8.5.13.1	Every roading authority shall not less than once every calendar year identify the presence of heather where it occurs within the road reserve as defined in section 5.4 within the heather Control Area. All heather identified shall be destroyed. Every roading authority shall destroy any heather within the heather Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate heather *(Calluna vulgaris)*, excluding double-flowered hybrids. **A breach of this rule will create an offence under section 154 (m) of the Act.**

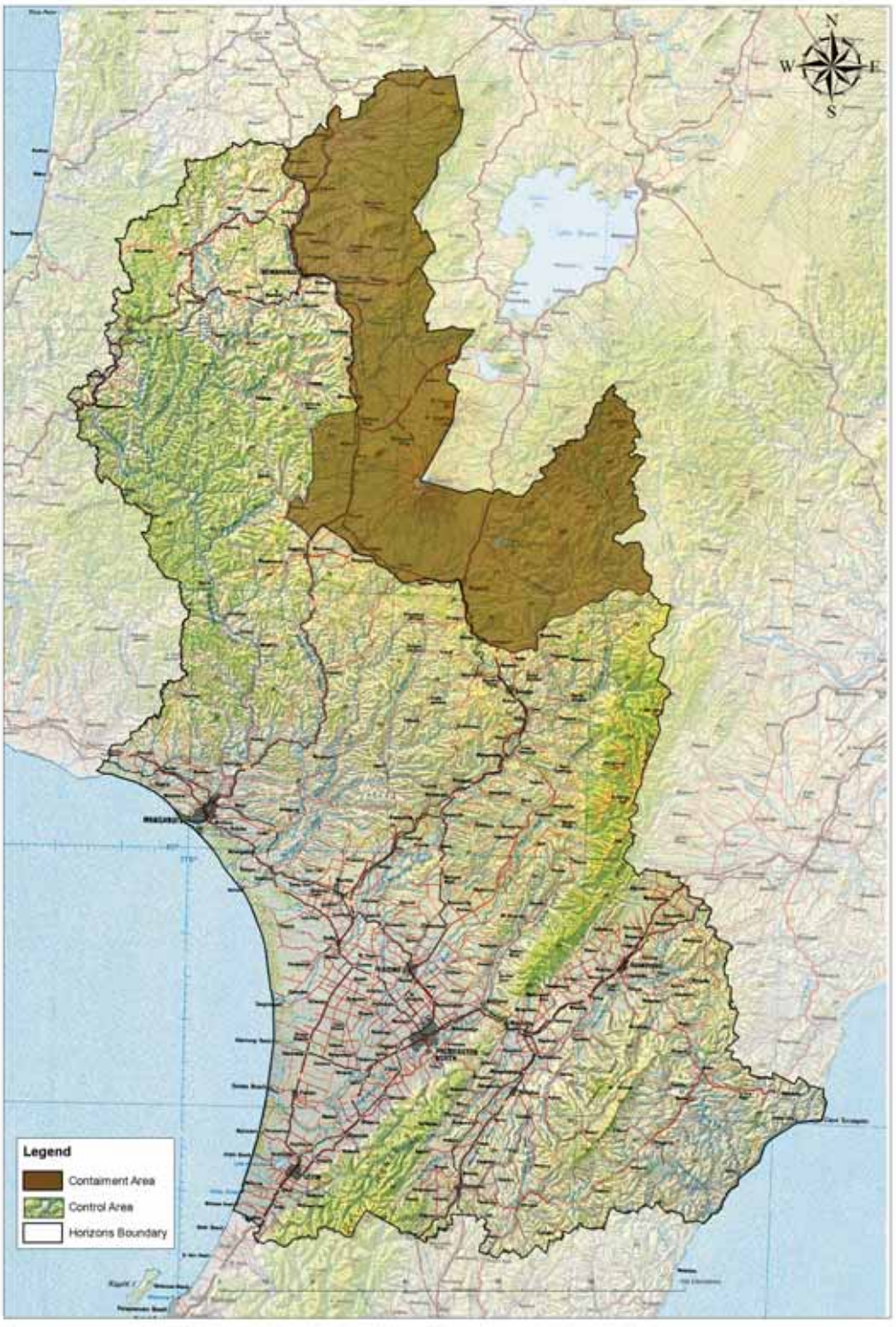


Figure 8.9: Map of the Manawatu-Wanganui Region showing the heather Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.5.14

knotweed

(Asiatic knotweed) *Reynoutria japonica*
and (giant knotweed) *R. sachalinensis*

REASON FOR INCLUSION

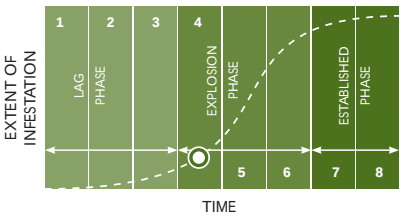
Knotweeds can tolerate a range of adverse conditions including shade, high temperatures, salinity, drought and severe floods.

The plants can form dense thickets and, once established, populations are extremely persistent.

Knotweed can hybridise, adding to the invasive potential of the species (Williams et al., 2000), and have the potential to be a considerable problem in riparian margins and low-lying areas. Asiatic knotweed is a serious pest plant in Australia, the United States and the United Kingdom.

DESCRIPTION

- Upright perennial herbs that can grow c. 3 m tall.
- Leaves are variable, oblong to spade-shaped and 5-14 cm x 3-13 cm.
- Flowers are very small, white-greenish in colour and produced in long spikes in summer.
- Winged fruits follow flowers and contain tiny, shiny black seeds.
- The plants produce long, stout, rhizomes.
- Dispersal is by water, wind, moving of soil or from vegetative fragments.



DISTRIBUTION

- Knotweeds have not yet established dense populations and are currently present as isolated low-density populations.

'Weediness' score:	25
Practicality score:	6
Unwanted Organism?	no

Impact evaluation for knotweeds in the Manawatu-Wanganui Region.

Area and Extent of Effect	Riparian margins	Low-lying areas	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓	✓			
Potential			✓	✓	✓ to soon to know

MANAGEMENT REGIME FOR KNOTWEED

OBJECTIVE

Zero-density

AIM

Reduce all populations of knotweeds in the Region to Zero-density by 2009 (Year 2).

MEANS OF DELIVERY

Horizons will undertake direct control.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Knotweeds will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by knotweeds. Newly discovered infestations will be subject to management objectives as per this Strategy.

Evaluation:

Post-August 2008, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for knotweeds will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advice and Information:

Horizons will provide advice and information on knotweeds to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Knotweed is maintained at Zero-density throughout the Region.

Infestations of knotweed are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate knotweeds *(Reynoutria japonica and R. sachalinensis).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

8.5.15

moth plant

Araujia sericifera

REASON FOR INCLUSION

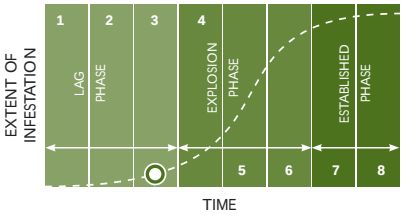
Moth plant has the ability to compete with and displace indigenous species. In gardens, the aggressive nature of the plant can be a problem.

The plant is poisonous and the sap has an irritant effect on contact. Moth plant can invade forest margins, disturbed habitat, riparian margins, banks and cliff faces, unmanaged areas and waste places.

Moth plant outside of the Containment Area is still at a population level where control to Zero-density is achievable.

DESCRIPTION

- Moth plant is a perennial climber that is capable of growing up to 5 m or more.
- Leaves are opposite, dark green above, pale beneath.
- Moth plant produces white fragrant bell-shaped flowers, followed by large, pear-shaped pods containing kapok-like material surrounding the black seeds.
- Dispersal is by wind (in autumn and winter), with each pod containing many seeds.
- Any broken part of this plant weeps a milky white sap.



DISTRIBUTION

- Moth plant has not yet established dense populations outside of Wanganui and Palmerston North cities, and is present in scattered isolated populations.
- Moth plant is present in some forest fragments.

'Weediness' score:	27
Practicality score:	6
Unwanted Organism?	yes

Impact evaluation for moth plant in the Manawatu-Wanganui Region.

Area and Extent of Effect	Shrublands and forest margins	Cliff faces	Riparian margins	Amenity and recreational values	Transformer species?
Current	✓				
Potential		✓	✓	✓	

MANAGEMENT REGIME FOR MOTH PLANT

OBJECTIVE

Containment

AIM

To control to Zero-density all moth plant within the Control Area by 2013 (Year 6).

MEANS OF DELIVERY

Horizons will undertake direct control of moth plant only within the Control Area (figure 8.10).

Roading authorities will be responsible for the control of all moth plant infestations within the Control Area where they occur within the road corridor.

Horizons will not conduct control of moth plant outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to moth plant, but rather focus on all pest management issues.

TOOLS

Enforcement:

Horizons will enforce control of moth plant where it occurs in all road reserves within the Control Area.

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Moth plant will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2012, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons will incorporate moth plant into generic awareness campaigns regarding responsible gardening practices (including species selection and garden dumping) as detailed in section 15.

Horizons may implement a targeted awareness campaign that focuses on moth plant.

Advice and Information:

Horizons will provide advice and information on moth plant to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Moth plant is controlled to Zero-density within the Control Area.

Moth plant infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of moth plant.

STRATEGY RULES

Strategy Rule	Explanation
8.5.15.1	Every roading authority shall not less than once every calendar year identify the presence of moth plant where it occurs within the road reserve (as defined in section 5.4) within the moth plant Control Area. All moth plant identified shall be destroyed. Every roading authority shall destroy any moth plant within the moth plant Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate moth plant *(Aruajia sericifera)*. **A breach of this rule will create an offence under section 154 (m) of the Act.**

Figure 8.10: Map of the Manawatu-Wanganui Region showing the moth plant Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.5.16

old man's beard

Clematis vitalba

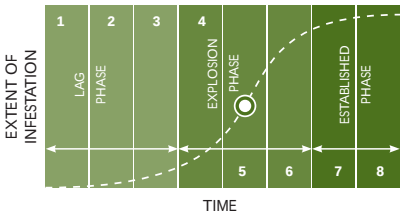
REASON FOR INCLUSION

Old man's beard is a highly aggressive vine that establishes rapidly in forest habitats, smothering canopy trees and forming dense carpets in the understorey, replacing indigenous species and suppressing regeneration. Old man's beard causes the collapse of forest fragments and is considered one of the country's worst weeds. The remaining forest habitat in the lowland and hillcountry of the Region is under extreme threat from old man's beard.

The infestation of old man's beard is too widespread and too dense for a Region-wide control programme to be successful. However, the high risk and extreme detrimental impact of old man's beard justifies intervention. The gains from controlling the outlying small populations of old man's beard are considerable. The focus for managing old man's beard is the protection of high-value forest habitat. It is acknowledged that management of old man's beard in forest habitat will be ongoing for many years to come.

DESCRIPTION

- A fast-growing, deciduous, perennial vine.
- Older vines become woody and brown or grey in colour. Young vines are ribbed and often purple.
- Leaf is composed of five leaflets. This is the easiest way to determine old man's beard from indigenous species.
- The flowers are creamy-white and loosely bunched (2-3 cm across).
- Old man's beard flowers in December-May followed by very conspicuous fluffy greyish white seed heads in autumn through to early spring.



DISTRIBUTION

- Old man's beard is extremely dense in parts of the Region, particularly through Rangitikei and Tararua Districts. An estimated 5,500 ha is infested within the Rangitikei District.
- Elsewhere in the Region, infestations are scattered and light or dense in isolated patches.

'Weediness' score:	33
Practicality score:	4
Unwanted Organism?	yes

Impact evaluation for old man's beard in the Manawatu-Wanganui Region.

Area and Extent of Effect	Forest and forest margins	Scrubland, shrubland and secondary forest	Production forests	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓	✓	✓	✓	✓	✓
Potential						

MANAGEMENT REGIME FOR OLD MAN'S BEARD

OBJECTIVE:

Containment

AIM

To control to Zero-density all old man's beard within the Control Area by 2022 (Year 15).

MEANS OF DELIVERY

Horizons will undertake direct control of old man's beard only within the Control Area (figure 8.11).

In situations where an occupier opposes the control methods used by Horizons, that occupier will become responsible for the control to Zero-density of all old man's beard on their property to the standard set by Horizons' staff. Horizons will meet the cost of this control to the amount of that incurred by Horizons' preferred method. Any costs additional to this will be met by the occupier. Horizons will help with advice on how to control and dispose of plants using different methods, even if such methods require more follow-up or take longer to be successful.

Roading authorities will be responsible for the control of all old man's beard infestations within the Control Area where they occur within the road corridor.

Horizons will not conduct control of old man's beard outside of the Control Area with the exception of prioritised sites of high natural value. Work within such sites will be driven by the site-led work (section 10) of the Regional Biodiversity Programme. Work within these sites will not be restricted to old man's beard, but rather focus on all pest management issues.

TOOLS

Enforcement:

Where occupiers choose to undertake control work themselves, Horizons' staff will enforce the Zero-density objective on occupiers. Where required, Horizons' staff will issue a Request to Clear notice and subsequently follow the enforcement procedure as outlined in section 6.2.3.

Horizons will enforce control of old man's beard where it occurs in all road reserves within the Control Area.

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Old man's beard will be monitored in accordance with section 6.2.5.

Evaluation:

Post-August 2017, the success of this programme will be evaluated. This assessment may result in the Control Area remaining static (with the possibility of deferred timeframes), being expanded, or being reduced (under amendment of the Strategy).

Advocacy:

Horizons will incorporate old man's beard into advocacy programmes and will undertake collaborations with other agencies.

Horizons may implement a targeted awareness campaign that focuses on old man's beard.

Advice and Information:

Horizons will provide advice and information on old man's beard to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Old man's beard is controlled to Zero-density within the Control Area.

Old man's beard infestations are restricted to within the Containment Area.

High-value natural areas prioritised for protection under the Regional Biodiversity Programme are maintained free of old man's beard.

STRATEGY RULES

Strategy Rule	Explanation
8.5.16.1	Where the occupier of a place is opposed to control being undertaken by authorised Horizons' staff, the occupier shall within 21 calendar days of being notified of the presence of old man's beard destroy all old man's beard located in the place they occupy.
8.5.16.2	Where an occupier of a place fails to comply with rule 8.5.16.1, authorized Horizons' staff may destroy all identified old man's beard located in that place.
8.5.16.3	Every roading authority shall not less than once every calendar year identify the presence of old man's beard where it occurs within the road reserve (as defined in section 5.4) within the old man's beard Control Area. All old man's beard identified shall be destroyed. Every roading authority shall destroy any old man's beard within the old man's beard Control Area as identified by an authorised person. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate old man's beard *(Clematis vitalba).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

Figure 8.11: Map of the Manawatu-Wanganui Region showing the old man's beard Control Area (widespread control) and the Containment Area (control only in prioritised high-value natural areas).

8.6.1

alligator weed

Alternanthera philoxeroides

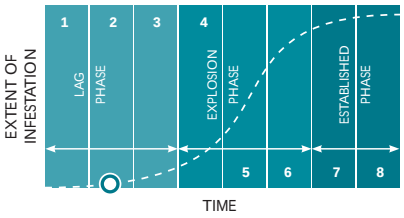
REASON FOR INCLUSION

Alligator weed grows quickly and can infest swamps, ponds, lagoons, stream banks, dune hollows and drains.

It also has the potential to grow in terrestrial situations causing economic losses to lowland pasture and cropping land. Mechanical drain diggers have been known to spread fragments between catchments. The values at risk are Region-wide, with immediate risk to the Whanganui River.

DESCRIPTION

- Alligator weed is an aquatic perennial herb with floating stems that form dense floating mats.
- It has soft, hollow stems up to 2 m long.
- The leaves are waxy, oval to egg-shaped in opposite pairs, lacking a stalk or with a short leaf stalk.
- The flowers are white, small papery florets in clover-like heads up to 13 mm in diameter produced on a long stalk.
- Alligator weed flowers in December-February.
- Reproduction of alligator weed occurs only from stem fragments.



DISTRIBUTION

- Alligator weed is known in the Region currently at only one site, near Taumarunui.
- The total size of the infestation covers an estimated area of 5 ha.

'Weediness' score:	28
Champion and Clayton aquatic ranking:	63
Practicality score:	8
Unwanted Organism?	yes

Impact evaluation for alligator weed in the Manawatu-Wanganui Region.

Area and Extent of Effect	Riparian margins	Wetlands and open water	Lowland damp pasture/ drainage channels	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓	✓	✓			✓ shallow lakes
Potential				✓	✓	

MANAGEMENT REGIME FOR ALLIGATOR WEED

OBJECTIVE

Zero-density

AIMS

Reduce all currently known populations of alligator weed in the Region to Zero-density by 2012 (Year 5).

MEANS OF DELIVERY

Horizons will undertake direct control.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Alligator weed will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by alligator weed. Newly discovered infestations will be subject to management objectives as per this Strategy.

Evaluation:

Post-August 2010, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for alligator weed will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advocacy:

The success of this programme will be heavily dependent on efficient advocacy. Aquatic pest plants will be the focus of a targeted awareness campaign. This campaign will emphasise the threat to the Region posed by aquatic pest plants and explain Horizons' approach to managing this threat.

Alligator weed will be incorporated into generic advocacy programmes covering aquatic pest plants, including information on limiting dispersal (eg boat hygiene) as detailed in section 15.

Advice and Information:

Horizons will provide advice and information on alligator weed to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Alligator weed is maintained at Zero-density throughout the Region.

Infestations of alligator weed are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate alligator weed. *(Alternanthera philpxeroides).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

Californian bulrush

Schoenoplectus californicus

8.6.2

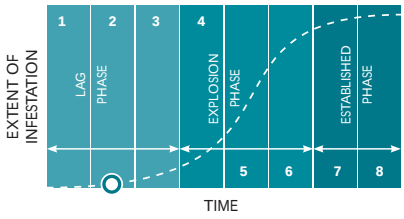
REASON FOR INCLUSION

Little is known about the effects of Californian bulrush. It has been reported as being a problem in Waikato and Northern Wairoa estuaries, where it has colonised sand banks and mud flats.

Californian bulrush is currently at population densities that have the potential to be eradicated from the Region.

DESCRIPTION

- Californian bulrush has rhizomes that are hard, woody and black, covered in loose, papery dark chestnut brown scales.
- The stems are light to dark green, often triangular in upper the third and are often greater than 2 m tall.
- Brown, pendulous seed heads are produced near the top of the stems.



DISTRIBUTION

- This plant is known at only one site in the Region, near Taumarunui.
- The total area of infestation is approximately 25 m^2.

'Weediness' score:	30
Champion and Clayton aquatic ranking:	unclassified
Practicality score:	8
Unwanted Organism?	no

Impact Evaluation for Californian Bulrush in the Manawatu-Wanganui Region.

Area and Extent of Effect	Lowland wetlands	Estuaries	Threatened species (or habitats of threatened species)	Amenity and recreational values	Amenity and recreational values
Current	✓				✓ lowland wetland and estuaries
Potential		✓	✓	✓	

MANAGEMENT REGIME FOR CALIFORNIAN BULRUSH

OBJECTIVE

Zero-density

AIM

Reduce all known populations of Californian bulrush in the Region to Zero-density by 2010 (Year 3).

MEANS OF DELIVERY

Horizons will undertake direct control.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Californian bulrush will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by Californian bulrush. Newly discovered infestations will be subject to management objectives as per this Strategy.

Evaluation:

Post-August 2009, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for Californian bulrush will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advocacy:

The success of this programme will be heavily dependent on efficient advocacy. Aquatic pest plants will be the focus of a targeted awareness campaign. This campaign will emphasise the threat to the Region posed by aquatic pest plants and explain Horizons' approach to managing this threat.

Californian bulrush will be incorporated into generic advocacy programmes covering aquatic pest plants, including information on limiting dispersal (eg boat hygiene) as detailed in section 15.

Advice and Information:

Horizons will provide advice and information on Californian bulrush to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Californian bulrush is maintained at Zero-density throughout the Region.

Infestations of Californian bulrush are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate Californian bulrush *(Schoenoplectus californicus).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

8.6.3

purple loosestrife

Lythrum salicaria

REASON FOR INCLUSION

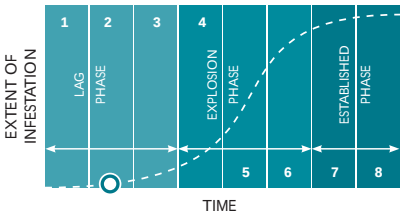
Purple loosestrife is very invasive in wetlands, around lake margins, streams, ditches and drainage channels and also on drier wasteland.

Purple loosestrife could potentially displace all other wetland plants in lowland wetlands, drastically altering native ecosystems. Purple loosestrife is one of the United States' of America's worst wetland pest plants.

Management of purple loosestrife to Zero-density is achievable at the known sites in the Region.

DESCRIPTION

- Purple loosestrife is a tall, slow-growing, hairy, herbaceous, perennial plant with a many-branched form, growing to 2 m tall.
- Leaves are stalkless, usually opposite.
- Purple loosestrife has dense, purple flowered spikes at the top of each branch and can produce thousands of long-lived seeds.
- Purple loosestrife dies back to root crowns over winter.



DISTRIBUTION

- Currently present at four sites in the Region: Lakes Horowhenua and Papaitonga and Hokio Stream near Levin, and Lake Virginia in Wanganui.
- The infestations are estimated to cover 30 ha.

'Weediness' score:	31
Champion and Clayton aquatic ranking:	54
Practicality score:	8
Unwanted Organism?	yes

Impact evaluation for purple loosestrife in the Manawatu-Wanganui Region.

Area and Extent of Effect	Lowland wetlands	Open water	Threatened species (or habitats of threatened species)	Amenity and recreational values	Low lying land/drainage channels	Transformer species?
Current	✓	✓			✓	✓ lowland wetlands
Potential			✓	✓		

MANAGEMENT REGIME FOR PURPLE LOOSESTRIFE

OBJECTIVE

Zero-density

AIM

Reduce all currently known populations of purple loosestrife in the Region to Zero-density by 2012 (Year 5).

MEANS OF DELIVERY

Horizons will undertake direct control.

TOOLS

Monitoring:

Horizons will conduct success monitoring during the course of control, and continue monitoring the sites annually for a further five years. Biennial site visits will occur thereafter. Purple loosestrife will be monitored in accordance with section 6.2.5.

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by purple loosestrife. Newly discovered infestations will be subject to management objectives as per this Strategy.

Evaluation:

Post-August 2011, the success of this programme will be evaluated. Should the number of new sites increase to the point where the Zero-density objective is not achievable, or control techniques are not returning a satisfactory success rate, the management regime for purple loosestrife will be adjusted accordingly. This could result in a deferring of the timeframes, incorporation of new control techniques or a reconsideration of the management objective (under amendment of the Strategy).

Advocacy:

The success of this programme will be heavily dependent on efficient advocacy. Aquatic pest plants will be the focus of a targeted awareness campaign. This campaign will emphasise the threat to the Region posed by aquatic pest plants and explain Horizons' approach to managing this threat.

Purple loosestrife will be incorporated into generic advocacy programmes covering aquatic pest plants, including information on limiting dispersal (eg gardeners sharing plants) as detailed in section 15.

Advice and Information:

Horizons will provide advice and information on purple loosestrife to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

Purple loosestrife is maintained at Zero-density throughout the Region.

Infestations of purple loosestrife are contained to outside the Manawatu-Wanganui Region.

STRATEGY RULES

Strategy Rule	Explanation
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate purple loosestrife *(Lythrum salicaria).* **A breach of this rule will create an offence under section 154 (m) of the Act.**

containment aquatic pest plants 8.6.4

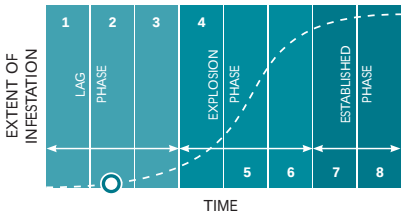
Four submerged and one emergent aquatic pest plant species are covered under this programme.

Eelgrass
(Vallisneria sp.)

- Perennial freshwater aquatic plants which can grow to a height of 5.5 m.
- Eelgrass is bottom rooting with stout rhizomes and long ribbon-like light green leaves growing from nodes at regular intervals along the rhizomes.
- Eelgrass grows in lakes but also in flowing waters.
- There is no evidence of viable seed production in New Zealand although mixed populations of this dioecious species do occur.

DISTRIBUTION

- Eelgrass is currently known from only one site in the Region - Lake Wiritoa, near Wanganui.

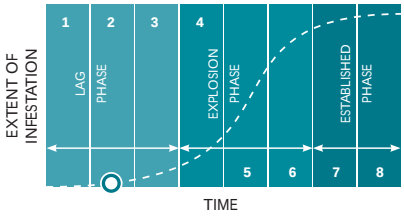


Hornwort
(Ceratophyllum demersum)

- A submerged freshwater perennial plant found in still or flowing water.
- Hornwort is often found in fertile, nutrient-rich waters but also grows in deep, clear lake waters to depths of 14 m.
- Hornwort does not have roots, instead having modified base leaves that anchor the plant into muddy substrates. Hornwort is often free floating.
- Stems are up to 7 m long, branched and brittle.
- Leaves are forked with toothed edges and arranged in whorls of 7-12.
- Flowers are minute and no seed is set in New Zealand. Asexual propagation is via fragmentation of plant stems.

DISTRIBUTION

- Hornwort is present throughout the Region, and was identified in 11 sites by Champion and Wells (2003). In addition to these sites, hornwort is also present in many drains in the lower Manawatu.

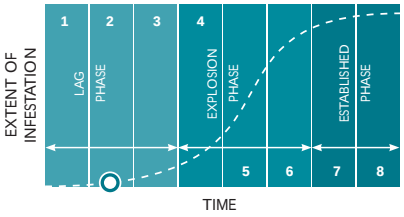


Egeria (oxygen weed)
(Egeria densa)

- A submerged perennial freshwater aquatic herb that grows in still and flowing waters.
- The plant is bottom rooted and produces long, slender and much branched leafy stems that grow to 4 or 5 m tall.
- This oxygen weed is larger and denser than Lagarosiphon having, 3-8 leaf whorls.
- Where the plant grows near the surface, it produces many white male flowers protruding just above the water surface in summer.
- The stems are brittle, fragmenting and rooting easily.

DISTRIBUTION

- Egeria is widespread throughout the Region.

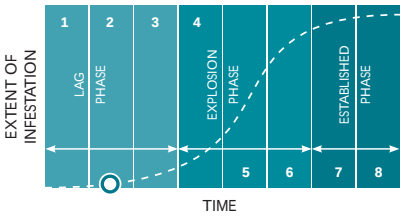


Lagarosiphon (oxygen weed)
(Lagarosiphon major)

- A vigorous perennial freshwater herb that grows submerged in lakes, ponds, rivers and streams.
- Leaves are arranged spirally around the stem (rather than whorled as is the case with other oxygen weeds) and are recurved backwards or downwards.
- The plant produces tiny, solitary, pink female flowers that do not produce seed in New Zealand.
- Oxygen weed is brittle, fragmenting and rooting easily.

DISTRIBUTION

- Lagarosiphon is present throughout the Region.

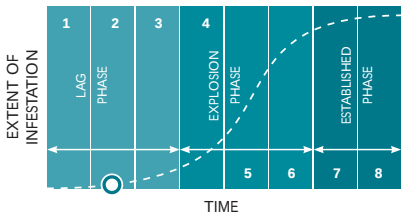


Reed sweet grass
(Glyceria maxima)

- Reed sweet grass is a large, aggressive aquatic perennial grass.
- The grass has long, upright, shiny, hairless, green leaves < 1 cm-7 cm wide that can grow to between 30 cm and 60 cm above water.
- Flowers appear in spikelets on stout, erect stems and are pale green in colour with purple spots.
- Reed sweet grass has an extensive root system and produces sprawling mats of rhizomes.
- Reed sweet grass is found in wet areas and can also grow in stable flowing rivers.

DISTRIBUTION

- Reed sweet grass is common in the Region but absent from some areas.



	Eelgrass	Hornwort	Egeria	Lagarosiphon	Reed sweet grass
'Weediness' score:	unclassified	27	24	27	28
Champion and Clayton aquatic ranking:	51	67	64	60	51
Practicality score:	site dependent	site dependent	site dependent	site dependent	site dependent
Unwanted Organism?	yes	yes	yes	yes	yes

Impact evaluation for Eelgrass, Hornwort, Egeria, Lagarosiphon and Reed sweet grass in the Manawatu-Wanganui Region.

Area and Extent of Effect	Lowland wetlands	Open water	Coastal dune lakes	Threatened species (or habitats of threatened species)	Amenity and recreational values	Transformer species?
Current	✓	✓		✓	✓	✓ Lowland wetlands/lake edges to 14 m deep
Potential			✓			

REASON FOR INCLUSION

Aquatic pest plants, although a relatively new threat to the Region, have a strong negative impact on waterbodies and the indigenous biodiversity supported by these systems.

The species included in this programme obstruct waterbodies, grow rapidly and are capable of forming dense masses which out-compete indigenous aquatic species. The plants can also impede drainage, block water intakes, cause flooding and affect water quality. Hornwort, in particular, poses a large risk to the Region's water-bodies as it quickly forms dense beds to 20 m deep. Rotting hornwort pollutes the water, killing any fauna present. Amenity and recreational values are impacted on as boating, fishing and swimming become difficult and unpleasant.

Aquatic plants, and in particular submerged aquatic plants, differ greatly from terrestrial plants in growth rate, spread and propagation, which have implications for detection and management.

These species, except for eelgrass, are dispersed passively as vegetative fragments, by common vectors of dispersal. Vectors include boats, trailers, water-skis, fishing equipment, eel nets, boots, dogs, kayaks, canoes, jet skis and coarse fish. Eelgrass requires deliberate planting to become established in a waterbody.

Combined with the inherent difficulty of controlling these pest plant species once they have become established, the most effective way to manage this group of pest plants is to manage the dispersal avenues. This will be an imperfect solution but the most effective nonetheless.

MANAGEMENT REGIME

OBJECTIVE

Containment

AIM

Dispersal of aquatic pest plant species from current locations is prevented.

MEANS OF DELIVERY

Horizons will record and map all known infestations of eelgrass, hornwort, Egeria, Lagarosiphon and reed sweet grass by August 2008 (Year 1), with new sites added to the database as they are discovered.

Horizons will undertake continual advocacy around aquatic pest plant awareness and dispersal pathway management.

Horizons will undertake awareness campaigns targeted at focal points and key user-groups. Collaboration between Horizons and other agencies will be pursued.

Horizons will oversee dispersal pathway management.

Horizons may undertake direct control of localised areas of infestation, or of newly discovered small infestations as and when required.

MANAGEMENT REGIME

TOOLS

Enforcement:

Enforcement of rules against intentional dispersal and spread of these (and other) aquatic pest plants will be enforced under this Strategy and the National Pest Plant Accord (section 6.2.3).

Consequences of non-compliance with Strategy Rule 8.6.4.1 will be enforced.

Dispersal Pathway Management:

Dispersal risk areas will be identified and targeted for management. The importance of inter-agency collaborations is recognised and such arrangements will be incorporated wherever possible into Horizons initiatives.

Such initiatives can include, but are not restricted to:

- erecting signage at both infested and non-infested sites advising of the risk of dispersal via boats, boat trailers, fishing gear, dogs, jet skis etc
- erecting signage that advises of ways to implement good hygiene practices
- producing (waterproof) flyers and/or pamphlets advising of ways to implement good hygiene practices
- localised weed control at public boat access and swimming areas to minimise the risk of transfer.

Advocacy:

Advocacy will be a fundamental component of this programme and is closely intertwined with the implementation of dispersal pathway management. All awareness campaigns will be consistent with the National Aquatic Pest Awareness Campaign - Stop The Spread. Advocacy initiatives can include, but are not restricted to:

- continuing to work internally (eg with Operations Group) to ensure continuation of sustainable drain management practices and other such initiatives
- working with contractors to promote an ethic of responsible work practices and advocating for machine hygiene
- targeting fishing groups (eg coarse fishers, eel fishers etc) and increasing the awareness of the need for fishing gear hygiene
- liaising with managers and owners of properties with infestations to facilitate co-ordinated management of dispersal avenues
- broader awareness programmes targeted at other lake user groups (ie the wider public).

Detection:

Horizons' staff will conduct searches in areas vulnerable to invasion by these aquatic pest plant species. In the occurrence of a newly discovered infestation, an assessment of the feasibility of control will be made. Where justified and practicable, new incursions will be controlled.

Where new incursions are discovered attempts will be made to trace and confirm vectors. Where feasible, management of these vectors will be implemented.

Monitoring:

The submerged aquatic plants will be monitored in accordance with section 6.2.5.

Advice and Information:

Horizons will provide advice and information on these species to occupiers and other interested parties in accordance with section 6.2.2.

OUTCOMES

The spread of aquatic pest plant species throughout the Region is slowed.

The range of these species is restricted to current infestations.

STRATEGY RULES	
Strategy Rule	Explanation
8.6.4.1	No person shall intentionally distribute, propagate or dispose of any or all of eelgrass, hornwort, Egeria, Lagarosiphon or reed sweet grass, except at legal landfills or authorised green waste dump sites. **A breach of these rules will create an offence under section 154 (r) of the Act.**
Statutory Obligation (Sections 52 and 53 of the Act)	No person shall knowingly sell, offer to sell, display in a place where plants are offered for sale or exhibition, distribute or propagate eelgrass, hornwort, Egeria, Lagarosiphon or reed sweet grass (*Vallisneria* sp., *Ceratophyllum demersum, Egeria densa, Lagarosiphon major, Glyceria maxima*). **A breach of this rule will create an offence under section 154 (m) of the Act.**

8.7 Potential Environmental Pest Plants Management Plan

There are species present within the Region that have potential to become ecologically damaging and invasive in natural areas, and therefore undesirable in certain habitats. Nine species that meet this criteria have been identified under this Strategy. Currently, Horizons lacks the level of knowledge pertaining to these species, and their abundance, distribution and threat within the Manawatu-Wanganui Region, to set control mechanisms or targets.

These species are collectively placed under the Monitoring objective. The Monitoring objective is a temporary measure to enable the collection of information. The species will be monitored to assess distribution, abundance and estimated rate of spread. Control trials may be undertaken to provide more detailed management-related information.

Time limits are assigned for this information to be gathered, after which the costs and feasibility of control will be determined. Potential pest plants will only have a Monitoring objective as a temporary status before being moved into one of the other management objectives (eg Zero-density, Containment) or being dropped from the Strategy.

A decision-making process to determine the management objective will be undertaken (following the same procedure as that for 'new incursions' as outlined in section 9). Management decisions will incorporate consideration of weed ecology models, eg lag phases, the infestation curve and the core-satellite model.

The species included in table 8.2 are not declared 'pests' (under the Act), and are therefore not banned from sale, propagation or distribution unless already banned outside of this Strategy (ie an Unwanted Organism or on the National Pest Plant Accord) until such time as they are moved onto a proactive management programme under this Strategy. Assigning a Zero-density or Containment management objective to a species will result in that species being banned from sale, propagation or distribution under Sections 52 and 53 of the Act.

8.7.1 Means of Implementation

Tasks to be completed under this objective (for each species) include:

- the electronic recording and digital mapping of all known infestations
- research into the biology of the plant.
- compilation of research into the ecological threat exhibited by the species elsewhere in New Zealand or overseas
- identification of habitats and areas that would potentially be at risk of invasion or would be detrimentally impacted on
- compilation of information on control techniques used elsewhere and their effectiveness or otherwise.

Methods used to complete the above tasks should include:

- utilising interagency relationships in order to share distributional data and biological information
- use of herbaria (identification, historic records of distribution) and research institutes
- conducting targeted awareness campaigns that solicit information from the public regarding distribution of species
- conducting control trials to determine the most effective, cost-efficient control method for the Manawatu-Wanganui Region.

Table 8.2: Potential pest plant species under the monitoring objective. A brief species description, area of likely impact, priority for work planning and timeframes by which to have made management decisions are indicated. Where known, the Weediness score and Champion and Clayton (2000) ranking for aquatic plants are provided (in brackets in the first column). Monitoring is to commence at the start of this Strategy and be concluded by the timeframe indicated. That is, it is envisaged that for some species it will take longer to collate the necessary data to make an informed decision.

Species	Species Description (Weediness score/ Champion and Clayton (2000) ranking)	Potential Threat To	Comments
Priority 1: (Year 1) Information compiled by August 2008, management objective decided by November 2008			
Cotoneaster *Cotoneaster pannosus*	Evergreen shrub c. 1-2 m tall with erect stems that become arching. Known from one site in the Region. (3)	Scrubland, forest margins, disturbed forest, secondary forest, open areas.	Monitoring should focus around the only known site in the Region.
Hemp agrimony *Eupatorium cannabinum*	An erect, perennial herb up to 2 m tall with small reddish-purple flowers. Hemp agrimony is currently ranked as a three on the Infestation Curve. (26)	Transformer weed in lowland wetlands and riparian margins.	Monitoring of this plants should include advocacy and surveillance initiatives. Horizons' efforts should be co-ordinated with those of DOC.
Priority 2: (Year 2) Information compiled by August 2009, management objective decided by November 2009			
Chocolate vine *Akebia quinata*	A high climbing deciduous or evergreen vine. Spreads vegetatively (fruits are rare in New Zealand) and is becoming invasive in other parts of the country. (24)	Scrubland, forest margins, disturbed forest and secondary forest.	Chocolate vine is uncommon in cultivation but is still available for sale. There is insufficient information available on distribution and abundance in the Region.
Climbing alstromeria *Bomarea caldasii*	A twining evergreen vine with large trumpet orange and yellow flowers.	Forest and scrub and potentially coastal habitats.	Still available for sale.
Queensland poplar *Homalanthus populifolius*	Shrub or small tree to c. 5 m. Can escape from cultivation.	Forests and disturbed areas and wasteland.	Often confused with endemic species from Kermadec Islands.
Priority 3: (Year 3) Information compiled by August 2010, management objective decided by November 2010			
Asparagus fern *Asparagus setaceus*	Scrambling or climbing perennial plant becoming woody. (21)	Forest margins, disturbed forest, secondary forest, scrublands and shelter belts.	Still available for sale.
Priority 4: (Year 4) Information compiled by August 2011, management objective decided by November 2011			
Field horsetail *Equisetum arvense*	Perennial fern ally, growing to 80 cm tall and dying back in winter. Is well established in Wanganui and Rangitikei. Field horsetail is toxic to stock and spreads by rhizomes and tubers. (21)	Favours moderate to high rainfall, growing in damp ground, and riparian margins.	Continue to pursue potential research programme and investigation of potential control methods.

Species	Species Description (Weediness score / Champion and Clayton (2000) ranking)	Potential Threat To	Comments
Priority 4: (Year 4) Information compiled by August 2011, management objective decided by November 2011			
Madeira vine *Anredera cordifolia*	Climber with tubers. Has a smothering habit and displaces indigenous species. Successful control of this plant has yet to be achieved. (25)	Scrubland, coastal habitats and also roadsides and wasteland.	Control trials conducted within the Manawatu-Wanganui Region should continue for another four years at least.
Priority 5: (Year 5) Information compiled by August 2012, management objective decided by November 2012			
Rhododendron *Rhododendron ponticum*	A large evergreen shrub (c. 6 m tall) with purple-violet flowers. Current distribution in the Region is unknown, but as this Rhododendron was the first to be introduced to New Zealand, it is likely to be in many gardens. This species can form large persistent thickets and is the worst invasive tree species in Britain. Germinates freely in pine needle litter. (30)	Open areas, scrubland, forest margins and fragments.	
Rum cherry *Prunus serotina*	A medium sized, deciduous tree. Distribution and density of rum cherry in the Region is currently unknown, but the species has been planted as a timber crop. Rum cherry is The Netherlands' and Germany's worst tree weed (unclassified).	Scrubland, forest margins and fragments, especially secondary forest.	

During the life of this Strategy, Horizons may feel it necessary to add one or more species to the list of species under the Monitoring objective. Such cases will be considered carefully, weighing up budget constraints with potential risk. In the event of additional species being added to the list, priorities and timeframes will need to be adjusted. A current list of potential pest plant species included under the Monitoring objective is available on request from Horizons.

8.7.2 Performance Measures and Monitoring

- Species information is collected by the timeframe indicated.
- Compiled information is collated into a form (eg report) that includes all aspects required to make an informed decision regarding a management objective.
- All species included under the temporary Monitoring objective are reviewed and assigned a management objective within the timeframe indicated.
- All subsequent control work is conducted with best practice methods and subject to success monitoring as for any of the species managed under Part Two of this Strategy (sections 6.2.5 & 6.2.6).
- All subsequent control work is monitored and reported on as per sections 6.2.5 & 6.2.6 of this Strategy.
- Any of these species that are adopted into the work plan are incorporated into generic or targeted awareness campaigns as appropriate.

PART THREE

OTHER MANAGEMENT PROGRAMMES AND INITIATIVES

9. SURVEILLANCE PROGRAMME

There is a large number of pest plants present outside our Region that have the potential to expand their range into the Manawatu-Wanganui Region and potentially become a problem here also. With more than 20,000 (Owen, 1997) introduced plant species in New Zealand, the establishment of new invasive species is inevitable.

Large-scale pest plant management programmes can be prohibitively expensive. The practicalities of undertaking large-scale control programmes and the logistics of widespread operations can often lead to a high risk of failure. Additionally, in many vulnerable habitats (eg cliff faces, wetlands, alpine) continued concentrated large-scale operations can result in unacceptable collateral damage.

Historically, RPPMSes have predominantly focused on pest plants that are already present within the Region. While in many cases such polices have clear merit, from an economic and common sense point of view it is timely to also focus strongly on an additional policy of prevention and precaution.

Surveillance is a simple and comparatively inexpensive way to ensure new threats are discovered and acted on before eradication becomes unachievable. Resources spent on prevention provide the greatest return.

Species typically take several years before they become established in the wild and several more before they begin to disperse widely. It follows that not all plant species currently in New Zealand have expressed their invasive potential. The number of pest plant species can only but increase. Many of these species are not yet present within our Region and any attempt to prevent future problems makes sound strategic sense.

Surveillance is the active or passive searching for actual or potential pest plant species. In the first instance the best and most cost-effective line of defence is to limit the occurrence of new pest plant species from becoming established in the Region. Species established elsewhere in the country can be excluded from the Manawatu-Wanganui Region. The value of preventing new pest plant species from becoming established within the Region cannot be overestimated. Surveillance facilitates early detection of new invasive species arriving in the Region. The surveillance procedure will incorporate the process from detection to action.

The pest plants included in the Surveillance Programme are either:

- not currently present in the Region but known to be a threat elsewhere and are likely to find a suitable habitat within the Region. Often these pest plants occur close-by in neighbouring regions
- already present in the Region but only in a limited area or confined to a small number of sites
- listed on a Biosecurity New Zealand National Strategy.

9.1 Objectives of the Surveillance Programme

The Surveillance Programme has the following core objectives:

- to increase detection rates of new pest plant species becoming established within the Region, or a species with limited distribution within the Region expanding its range
- to produce an identification manual of the species listed in this programme to facilitate detection
- to implement a systematic process whereby decisions and actions are made following a discovery of a new species within the Region
- to continue to assist Biosecurity New Zealand with the enforcement of the National Pest Plant Accord
- to facilitate quick response through appropriate funding that will enable the control or management of newly discovered threat species
- to improve and maintain relationships with other agencies and establish memoranda of understanding to ensure information on new threats is shared
- to report on surveillance actions and initiatives, including recording and disseminating information on the distribution of new plants.

9.2 Means of Implementation

Surveillance is not an easy task. The Manawatu-Wanganui Region is a large area with an indeterminable number of potential species arriving along many varied pathways. The reality of surveillance is that success will be limited by terrain, accessibility, in-field botanical knowledge, observational skill and, in some cases, institutional and individual will. The importance given to surveillance operations alongside continued and strengthened interagency relationships will go some way to overcoming this.

Whilst certain species are targeted under this Strategy, certain areas will also be targeted for surveillance operations. Such areas include:

- known dispersal pathways (river corridors, roading systems, trucking/transport operations, roadside plantings)
- source areas (historic homesteads, settlements, large arboretums, botanic gardens), areas of border crossing (airports)
- areas of high visitor use (lakes, recreational areas, camping grounds)
- urban areas (concentration of people, known dumping sites, surrounding landfills, 'wasteland')
- areas of high natural value and areas prone to invasion (disturbed or modified land, edge habitats, low stature habitats, forest fragments in close vicinity to settlements).

When surveillance species are discovered that are unwanted organisms Horizons may undertake small-scale management programmes for these under section 100 of the Act. This process is detailed further in section 12 of this Strategy. It is possible that pest plant species that may potentially establish in the Region may be eligible for a response as detailed by section 100 of the Act.

Strategy Rule	Explanation
Rule 9.1	No person shall dispose of garden waste containing any part of plant(s) that can establish at point of dumping (eg seed heads, corms, roots, bulbs), except at legal landfills or authorised green waste dump sites. **A breach of this rule will create an offence under section 154 (r) of the Act and penalties can be imposed as directed under section 157 of the Act.**

Table 9.1: Implementation methods for the surveillance programme.

Active Surveillance:	Systematic searching focused on vulnerable areas and valuable natural areas for particular species. Active surveillance will become an integral component of the yearly work plan. Active surveillance will be conducted when the species in question is most obvious. In the instances of sites (rather than species) being focused on, active surveillance should be conducted during the spring and summer months. Searching methods will be detailed in the operational plan and will involve specific species in specific places, using methodical search techniques. Horizons will inspect plant nurseries and retail outlets (including pet shops) to ensure compliance with the National Pest Plant Accord.
Passive Surveillance:	Opportunistic findings. Contributions will be made by other agencies, voluntary groups and other Horizons' staff. Passive surveillance will occur indirectly alongside all other aspects of the yearly work plan.

Supporting Actions:

Field Manual

All field staff will be supplied with a detailed colour manual for the species included in this programme. The manual will include identification features, biological information, habitat preferences and any other information that would assist in field staff becoming familiar with the species. The manual will be updated as new species are included in the programme.

Assessment Process

Once a new discovery has been made a step-wise process will be undertaken to determine the level of threat, the distribution within the Region and probable cost of control. From this the appropriate management decision will be made (figure 9.1).

Recording

Information obtained from other agencies, voluntary groups, internally or members of the public will be logged. Logged observations will be followed up and acted on as required.

Time spent in active surveillance will be recorded. Details to record include hours spent, location, species involved, search method and outcomes.

Any control operations that evolve out of a surveillance operation will be recorded, monitored and reported on as per sections 6.2.5 and 6.2.6.

Additional Initiatives:

Interagency Relationships

There are immense gains to be made by sharing resources between organisations. This can involve well-established agencies as well as voluntary interest groups.

- Sharing of knowledge (including distributional data) between agencies.
- Regular meetings between field staff of Horizons and other agencies.
- Establishment and implementation of processes allowing members of voluntary groups to report a plant or observations of spread. Such processes need to result in actions.
- Improving and maintaining relationships between Horizons and other agencies and voluntary organisations. These include (but are not restricted to) Department of Conservation, Ministry of Agriculture and Forestry, Biosecurity New Zealand, territorial local authorities, iwi authorities, Forest and Bird, Fish and Game, Federated Farmers, botanical societies, garden clubs, land care groups.
- Maintaining relationships with herbaria and professional individuals to ensure rapid identification of new species.
- Continuing inspections of garden retailers and reporting any transgressions of The National Pest Plant Accord to Biosecurity New Zealand (Section 11).

Intra-agency Relationships

Good use of staff within Horizons will increase the possibility of detection of new plants. In particular, the soil conservators, operations and hydrology teams and other staff who spend time in the field should be encouraged to report unusual discoveries.

- Internal advocacy will be required to heighten awareness of the risk of new invasions.
- Workshops on identification and habitat preferences of the plants on the surveillance list will be needed.

Plant Nurseries and Garden Retailers

Many of the future environmental pest plant problems will originate from gardens. The relationship between Horizons and plant nurseries and garden retailers has strong potential to be taken beyond the yearly check and regulatory processes (section 6.2.5) to a situation where all parties are working towards the prevention of further invasive species becoming established within the Region.

- Horizons' relationship with the garden industry needs to be extended beyond a regulatory role.
- Information on responsible gardening choices (including disposal of garden waste) needs to be readily available from point of sale. Such initiatives will need to be supported and advocated by plant retailers.

Public Involvement

Public involvement should be channelled via particular vulnerable sites (eg lakes) or be species-specific. Options include 'Have you Seen This Plant?' type signage at areas of high visitor use, or 'Does This Grow in Your Garden?' type postcard drops.

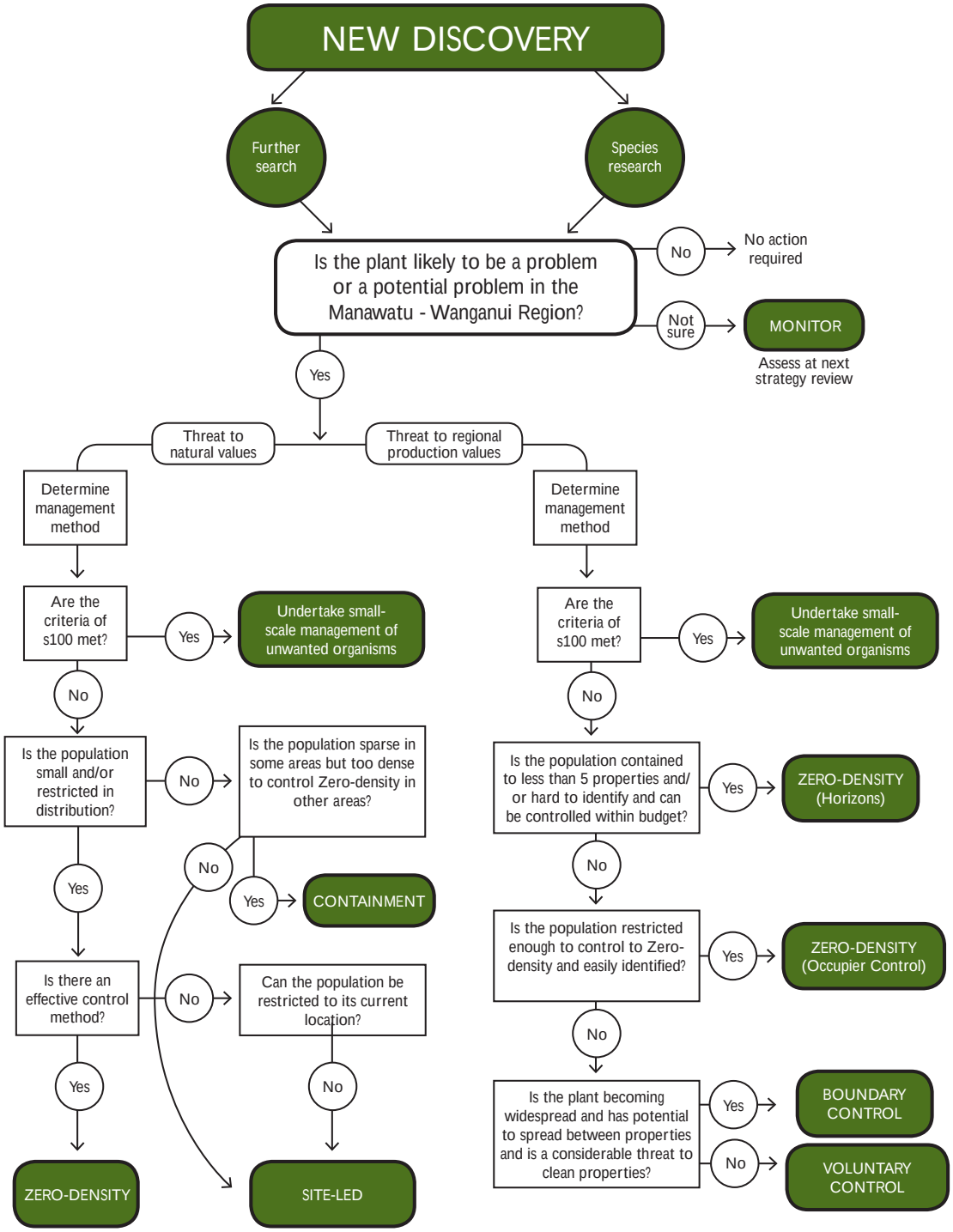


Figure 9.1: From discovery to management: a diagrammatic representation of the decision-making process. It should be noted that management options are not restricted to those depicted and include other mechanisms available under the Act (eg s130 - restricted places).

9.3 Performance Measures and Monitoring

Monitoring the Surveillance Programme will establish the extent to which the objectives of this programme are being achieved (outcome monitoring) and gather information on which future management can be based.

- All pest plant staff are provided with an up to date manual containing identification notes and biological information on the species under surveillance. The first version of this manual will be compiled within the first six months of this Strategy.
- Schedules of areas vulnerable to invasion or likely sources of new invasions will be compiled by January 2007. These schedules can be updated and amended as required during the life of this Strategy.
- Identified areas vulnerable to invasion and key aquatic areas will be surveyed for new species at least biennial.
- Upon discovery of a new species, the identification and evaluation process will commence, with a decision on a management objective made within four weeks. This decision is to be made with the support of the biodiversity and biosecurity managers, and the pest plant team is to be updated on the outcome.
- All observations reported (internally and externally) will be logged (species, location (grid reference), name and/or organisation of observer) and responded to within two weeks.
- All recorded observations will be mapped annually.
- Field staff will meet with field staff from the Department of Conservation at least once a year. These meetings should be used as a vehicle to facilitate sharing of knowledge and data, alerting to new threats, and training staff on plant identification skills.

Horizons will monitor the surveillance programme by:

- Recording the number of reported observations of surveillance species found and by whom (Horizons or external agencies).
- The response time and the subsequent action taken when surveillance species are found.
- The number of surveillance species controlled will be monitored (section 6.2.5) and reported on (section 6.2.6).
- Any control work undertaken as a result of a surveillance exercise will be incorporated into the Strategy outcomes and monitored and reported on according to sections 6.2.5 & 6.2.6 of the Strategy.

9.4 Pest Plant Species on Horizons' Surveillance List

A list of the pest plant species currently included on Horizons' surveillance list is provided in table 9.2. This will be a dynamic list. Additional species can be added to the Surveillance Programme at any time during the life of this Strategy should Horizons deem it necessary. An up to date list of the pest plants under the Surveillance Programme is available from Horizons upon request.

Table 9.2: Pest plant species included in this strategy under the Surveillance Programme.

Species	Type of Pest Plant	Unwanted Organism?	Currently in Region?
Arrowhead *Sagittaria montevidensis*	Environmental (aquatic)	Yes	No
Bladderwort *Utricularia gibba*	Environmental (aquatic)	Yes	No
Chilean needle grass *Nassella neesiana*	Production	No	No
Heath rush *Juncus squarrosus*	Environmental (aquatic)	No	No
Manchurian wild rice *Zizania latifolia*	Environmental (aquatic)	Yes	No
Noogoora bur *Xanthium strumarium*	Production	No	No
Phragmites *Phragmites australis*	Environmental (aquatic)	Yes	No
Saffron thistle *Carthamus lanatus*	Production	No	No
Sagittaria *Sagittaria platyphylla*	Environmental (aquatic)	Yes	No
Senegal tea *Gymnocoronis spilanthoides*	Environmental (aquatic)	Yes	No
Spartina *Spartina* sp.	Environmental (aquatic)	No	Yes[10]
Sweet pittosporum *Pittosporum undulatum*	Environmental (terrestrial)	No	No
Tussock hawkweed *Hieracium lepidulum*	Environmental (terrestrial)	No	No

The following pest plant species are managed by Biosecurity New Zealand under national strategies. Whilst not requiring direct involvement from Horizons, any discovery of these pest plants by Horizons' staff will be reported to Biosecurity New Zealand. Horizons recognises the value of continued dialogue between all the agencies involved in pest plant management.

[10] Spartina is currently present in the Manawatu Estuary and is being actively controlled by the Department of Conservation. It is likely that this infestation will be eradicated during the life of this Strategy.

Table 9.3: Pest plant species included under a national strategy managed by Biosecurity New Zealand. Discovery of new infestations of these species in the Manawatu-Wanganui Region will be reported to Biosecurity New Zealand.

Species	Type of Pest Plant	Unwanted Organism?	Currently in Region?
African love grass *Eragrostis curvala*	Production	Yes	No
Cape tulip *Homeria collina*	Production	Yes	Yes
Hydrilla *Hydrilla verticillata*	Environmental (aquatic)	Yes	No
Johnson grass *Sorghum halepense*	Production	Yes	No
Pyp grass *Ehrharta villosa*	Environmental (terrestrial)	Yes	Yes
Salvinia *Salvinia molesta*	Environmental (aquatic)	Yes	No
Skeleton weed *Chondrilla juncea*	Production	Yes	No
Water hyacinth *Eichhornia crassipes*	Environmental (aquatic)	Yes	No
White bryony *Bryonia cretica* ssp. *dioica*	Environmental (terrestrial)	Yes	Yes

10. SITE-LED PROGRAMME

10.1 Introduction

Although the extent to which the Act allows for or directs indigenous biodiversity protection and site-led habitat management is currently unclear, Horizons recognises the importance of pest control within natural areas and supports the establishment of relationships with interested private landowners to this end.

Horizons has a mandate under the RMA to maintain indigenous biodiversity. Integrated pest management is a fundamental element of meeting this obligation. Herein lies the underlying link between the two pieces of legislation.

This programme covers a large number of environmental pest plants. These pest plants are mostly widespread within the Region, have been established in the Region for a considerable time and are present in high-density populations (at the top end of the infestation curve). In such cases it is more economic, and the greatest indigenous biodiversity protection can be achieved through focusing control only in high-value sites. Limited funds and resources require rationalisation of expenditure.

The control of environmental pest plants needs to be focused and strategic to make positive measurable differences to the ecological integrity of the Region's remaining natural areas. This will be achieved by regionally-driven prioritised habitat (site-led) management. This approach also requires an overriding acceptance that many situations and many areas will not be targeted for control programmes.

The Site-led programme recognises that some species under this programme may be largely benign or even desirable for land management in some habitats and landscapes of the Region. However, within high-value natural areas these species are considered undesirable. The species included in table 10.1 are not declared 'pests' (under the Act), nor are they banned from sale, propagation or distribution unless already banned outside of this Strategy (ie an unwanted organism or on the National Pest Plant Accord).

10.2 Defining Sites

Scale is not necessarily consistent across all sites targeted for site-led management. For the purposes of this Strategy the term 'Site-led' refers to, or can include:

- any identified significant[11] natural area (forest fragment, wetland, scrubland, shrubland, tussockland, coastal community, freshwater habitat or estuary).
- a collection of discrete sites (as above) clustered close together.
- buffer zones (of various scale) around a discrete site, collection of sites, or another agency's site-led programme. Buffer zones will generally be a component of the site in question, but can also be an area around a seed source (eg embankments, roadsides). The extent of a buffer area will be site-specific and focus on risk management
- any distinctive landscape (eg Volcanic Plateau) and the habitats it supports
- any area of similar habitat type (eg coastal habitat)
- a geographically defined area (eg urban area). In such cases it is recognised that the outcomes may not be entirely biodiversity driven. Such sites will receive control in response to community desires.

Methods of Site Prioritisation

High-value natural areas will be prioritised for active management according to ecological criteria (eg representativeness of habitat, presence of threatened species and ecological context). This assessment process is described in detail in the ONE PLAN (and associated technical report). The biodiversity programme for the Region (a non-regulatory method of the policy framework) will drive site-led management.

Once sites have been identified for active management, a process of identifying threats (including pest plants) to the site will be undertaken. Then, pest control or other activities will be conducted in order to eliminate or manage those threats. Details pertaining to site management will be outlined in each individual site plan. The focus for high-value natural areas will be on integrated site management (ie pest plant control in conjunction with pest animal control, fencing,

[11] As identified under the ONE PLAN methods.

hydrology management and other site restoration requirements).

In some cases, buffer areas may include more than one property, or property not associated with the natural area. Occupiers are under no statutory obligation to cover the costs of control of pest plants within defined buffer areas that fall on their property. Horizons will encourage relationships and nurture partnerships with landowners for a positive result and protection of the site.

10.3 Objectives of the Site-led Programme

- This Strategy will follow the objectives outlined in individual site-specific work plans.
- Natural areas of regionally high ecological value will become managed as pest-free sites.

10.3.1 Methods of Achieving the Objectives

- Site-specific management plans will be developed for prioritised high-value natural areas across the Region. These management plans will outline pest plant control alongside pest animal control and other restoration requirements as appropriate.
- Buffer areas will be established surrounding high-value natural areas (including some public conservation land). The size of the buffer, and species to be controlled within the buffer, will be determined on a site-specific basis (risk management) and be detailed in the relevant site operational plan. A buffer may need to be multi-layered with different species managed to different population levels at varying distances from the site. Pest plant species (as listed in this Strategy) targeted for control within this buffer zone will be at the discretion of Horizons. Horizons is under no obligation to control all pest plant species listed in this Strategy within a defined buffer zone.
- Buffer areas can be established between new housing subdivisions and natural areas (eg coastal subdivisions, housing in close (2 km) proximity to forest fragments). These buffer areas will act as 'plant exclusion zones' and will target site-specific threats. Partnerships between Horizons and occupiers will be essential. In conjunction with buffer areas, these areas would be a focus for awareness campaigns (behaviour change) and advocacy initiatives regarding responsible gardening practices.
- Memoranda of understanding will be established and maintained between Horizons and external agencies to achieve the best biodiversity outcomes for the Region.
- The focus for urban areas will be primarily on reducing densities of current environmental pest plants and prevention of new environmental pest plant problems in the urban landscape. This will be done largely through targeted, informed advocacy programmes and memoranda of understanding with other agencies also working within the urban landscape.

10.4 Performance Measures and Monitoring

- Performance measures and monitoring are outlined in individual site-specific work plans.
- The site-led programme will be successful when high-value natural areas are being managed in an integrated manner in line with regional policy, and incorporating the Regional Animal Pest Management Strategy and other management requirements.
- Relationships between other agencies and landowners are maintained and result in achievement of the above success criteria.

10.5 Pest Plant Species Included in the Site-led Programme

Under this Strategy, the following species are considered 'pest plants' in the context of the regional site-led programme. This list is not exhaustive and additional undesirable species may be encountered, or new species become known during the life of this Strategy. In such cases, Horizons is not limited to the list herein and can conduct a control programme on exotic plant species as required to achieve integrated habitat management. Such work will be in keeping with the individual site management plan. An up to date list of species can be obtained from Horizons.

The list given here provides a guide to the scope of site-led pest plant management as well as an indication of the magnitude of the threat posed to our natural areas by environmental pest plant species. The list as it currently stands also provides a clear indication of the pest plant species that Horizons has chosen to manage solely within high-value natural areas. Resources will not be diverted to controlling these species in an ad hoc manner in other less strategic areas.

A number of these species are banned from sale, propagation and distribution under the National Pest Plant Accord (section 11).

Under the Site-led Programme, Horizons may control:

- any of the species listed in table 10.1
- any of the species under section 8 of this Strategy
- any species on the National Pest Plant Accord or listed as an Unwanted Organism
- any other species that is threatening or interrupting ecological processes and systems (including indigenous species) where non-management would compromise the ecological integrity of the site.

Table 10.1: Non-exhaustive list of species considered under this Strategy as 'pest plant species' in the context of Site-led habitat management. Note: Species followed by an asterisk (*) are included on the current National Pest Plant Accord.

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
African clubmoss* *Selaginella kraussiana*	A fern that forms mats on the forest floor of disturbed forest and shrubland, suppressing native regeneration. African clubmoss is widely distributed throughout the Region.	5	23	Yes	
Agapanthus *Agapanthus orientalis*	A bulb herb that forms dense infestations, suppressing indigenous regeneration and excluding species, particularly in coastal areas, open areas and cliff faces.	5	17	No	Yes Coastal cliffs
Alder *Alnus glutinosa*	Tree to c. 15 m. Can form pure stands along riparian margins and in moist situations. Can colonise bare ground.	5	26	No	Yes Welands
Arum lily *Zantedeschia aethiopica*	Evergreen erect clump-forming plant found in damp areas. Can grow to c. 1.5 m tall and form dense swards that exclude indigenous species.	5	22	No	
Bamboo *(various species)* *Including Bambusa, Phyllostachys and Pseudosasa species.*	The various bamboo species can form dense stands that exclude other species. Running bamboo species are particularly aggressive spreaders. Bamboo grows along riparian margins, forest edges and clearings and usually establishes from garden dumping.	6	28	No	
Barberry *Berberis glaucocarpa*	Evergreen or semi-deciduous tree to c. 7 m. Can invade disturbed forest, forest margins, tussockland and scrub and can colonise bare ground. Barberry can out-compete indigenous understorey species.	7	26	No	
Bear's breeches *Acanthus mollis*	Perennial herb. Spreads vegetatively and by corms to form dense swards. Can establish and spread in riparian margins, shady areas and also roadsides.	-	19	No	
Bittersweet *Solanum dulcamara*	Scrambling or sprawling perennial. A poisonous plant that can invade scrub, forest margins, riparian margins and other moist places.	5	20	No	
Black wattle *Acacia mearnsii*	Shrub to large tree. Highly invasive forming monocultures in disturbed forest, forest margins, riparian margins and can also colonise open areas.	4	25	No	

[11] Organisms that have been determined unwanted by chief technical officers of Government departments with biosecurity interests. The Unwanted Organism Register also contains organisms declined importation by the Environmental Risk Management Authority (ERMA NZ) and organisms listed in the second schedule of the Hazardous Substances and New Organisms Act 1996.

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Blue morning glory* *Ipomoea indica*	A high climbing perennial vine that can overtop and smother canopy trees as well as species in the understorey and ground cover species. Suppresses indigenous regeneration. Invades forest margins, disturbed forest, scrub, shrublands and roadsides.	3	30	Yes	Too soon to know
Boxthorn *Lycium ferocissimum*	Densely branched evergreen shrub growing to c. 1-6 m tall. Aggressive on sand dunes and in coastal scrub. Can also invade and spread in forest margins and disturbed forest.	5	27	Yes	Yes Dunes and coastal cliffs
Brush wattle *Paraserianthes lophantha*	Evergreen shrub - small tree. Aggressive, especially in disturbed scrubland, shrubland and disturbed forest.	4	24	No	
Buddleia *Buddleja davidii*	A deciduous shrub c. 4 m. Forms dense colonies in disturbed forest, shrublands, tussockland and riparian margins. Also production forest, roadsides, quarries and amenity areas.	-	26	No	
Buddleia *Buddleja salvifolia*	Large evergreen shrub c. 5 m. Is spreading from settlements to roadsides and forest margins.	-	Unclassified	No	
Cape gooseberry *Physalis peruviana*	Annual or short-lived sprawling or spreading perennial plant. Invades open areas, coastal habitat and disturbed habitats.	5	18	No	
Cape honey flower *Melianthus major*	Shrub to c. 2 m. Can form dense stands in sand dunes, scrubland, disturbed forests, shrublands and tussockland. Can also colonise roadsides and bare ground.	4	25	No	
Cape ivy *Senecio angulatus*	Scandent perennial herb, sometimes forming a dense tangled shrub to c. 2 m tall. Coastal areas, scrubland, shrublands and disturbed forests. Can also colonise roadsides.	4	29	No	
Castor oil plant *Ricinus communis*	Erect shrub to c. 4 m tall. Can invade coastal cliffs and dunes. Also roadsides.	-	22	No	

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Cherry laurel *Prunus laurocerasus*	Evergreen, widespread shrub or tree to c. 20 m. Can establish in forest margins and scrubland.	5	23	No	
Cherry plum *Prunus erasifera*	Deciduous shrub or small tree c. 8 m tall. Establishes in riparian margins, forest margins, sand dunes, also waste land and roadsides.	5	22	No	
Chilean flame creeper* *Tropaeolum speciosum*	Perennial climber that invades forest fragments, disturbed forest, forest margins and scrub. Especially invasive on the Volcanic Plateau and can smother and collapse canopy trees.	4	23	Yes	
Christmas lily *Lilium formosanum*	Perennial bulb. Has established in coastal areas and sand dunes as a garden escapee.	4	21	No	
Climbing asparagus* *Asparagus scandens*	Scrambling or climbing perennial vine. Can ringbark canopy trees, can smother understorey and suppress regeneration. Establishes in forests, disturbed forests and shrublands.	4	28	Yes	Yes Secondary forest
Climbing dock *Rumex sagittatus*	Scrambling or climbing perennial. Can smother trees.	5	24	No	
Coastal wattle *Acacia sophorae*	Small tree. Forms dense stands and can exclude indigenous species in coastal habitats, especially sand dunes.	4	26	No	Yes Dune systems
Corsican pine *Pinus nigra*	Medium-large tree with narrow architecture. Establishes in scrubland and tussockland. A threat to the Volcanic Plateau.	3	27	No	Yes All low-stature habitats
Cotoneaster *Cotoneaster franchetii*	Shrub growing to c. 3-5 m tall. Replaces indigenous forest and also invasive in exotic forest. Low forest, forest margins, riparian margins, disturbed forests, cliff faces and roadsides.	5	25-28	No	Yes Papa cliffs

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Cotoneaster *Cotoneaster glaucophyllus*	Shrub growing to c. 3 - 5 m tall. Invades low forest, forest margins, riparian margins, disturbed forests, also roadsides and exotic forests.	5	25	No	
Cotoneaster *Cotoneaster lacteus*	Spreading, evergreen shrub to c. 1.5-3 m. Invades scrub, roadsides and wastelands.	5	Unclassified	No	
Cotoneaster *Cotoneaster microphyllus*	Dense, evergreen shrub to c. 1 m. Forms dense stands. Invades riparian margins and steep areas.	3	Unclassified	No	
Crack willow *Salix fragilis*	Tree to 25 m tall. Can block waterways and grows easily from fragments. Establishes quickly in waterways, ponds, lakesides and wet habitats.	8	28	No	
Douglas fir *Pseudotsuga menziesii*	Large or very large tree capable of invading disturbed forest, shrublands and tussocklands. Is colonising the Volcanic Plateau.	4	24	No	Yes All low-stature habitats
Dysophylla *Buddleja dysophylla*	Evergreen shrub, often semi-scrambling. Colonises open areas, and invades coastal habitats and roadsides. Can exclude indigenous species.	3	Unclassified	No	Too soon to know
Elaeagnus *Elaeagnus* X *reflexa*	Long-lived vigorous scrambling vine with stems up to 20 m long. Forms heavy dense smothering blankets that can collapse canopies and suppress indigenous regeneration.	4	31	No	
Elder *Sambucus nigra*	Shrub or small tree to c.6 m. Invades scrub, forest margins and disturbed habitats.	6	22	No	
European spindle tree *Euonymus europaeus*	Deciduous shrub or small tree up to 6 m tall. Can establish in scrubland and forest margins.	4	19	No	
Figwort *Scrophularia auriculata*	A perennial to c. 80 cm that establishes on riverbanks and in damp areas.	5	Unclassified	No	
Firethorn *Pyracantha angustifolia*	Evergreen shrub growing to c. 2.5-5 m tall. Invades scrublands and forest margins.	-	21	No	

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Garden nasturtium *Tropaeolum majus*	Aromatic annual or short-lived perennial. Escapes from settlements and forms dense carpets in coastal areas, moist or shady situations, riparian margins and waterways.	4	19	No	
German ivy *Senecio mikanioides*	Scrambling, soft perennial herb that can smother low-growing plants and suppress indigenous regeneration. Invades disturbed forests, shrublands, forest margins, scrublands and especially coastal areas.	5	26	No	
Giant reed *Arundo donax*	A tall perennial reed-like grass that can grow to c. 8 m. Is extremely aggressive in riparian margins and can also invade forest margins, scrubland and roadsides. Excludes other species and can suppress indigenous regeneration.	-	29	No	Yes Riparian margins
Grape vine *Vitis vinifera*	Vigorous vine. Spreads from historic settlements and cultivation. Can smother plants and suppress regeneration.	3	22	No	
Greater bindweed/ pink bindweed *Calystegia sepium*	Perennial rhizomatous herbs, scrambling and climbing. Common on roadsides, also wetlands, lakesides, forest margins, banks and waste places.	6	Unclassified	No	
Hawthorn *Crataegus monogyna*	Shrub or small tree growing to c. 20 m. Escapes from settlements and invades scrublands, forest margins, riparian margins, also open areas and roadsides.	6	31	No	
Himalayan fairy grass *Miscanthus nepalensis*	A hardy clump-forming grass that forms dense swards excluding indigenous species. Can invade forest, forest margins, scrublands and open areas.	-	27	No	
Himalayan honeysuckle *Leycesteria formosa*	Semi-deciduous perennial scrambling shrub less than c. 3 m. Forms dense colonies in disturbed forest, shrublands, fernlands. Also colonises bare ground and commercial forestry.	6	22	No	
Holly *Ilex aquifolium*	Evergreen shrub or small tree c. 12 m tall. Establishes in scrubland and forests.	5	28	No	

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Hops *Humulus lupulus*	Dioecious or monoecious climber spreading from old settlements and homesteads into riparian margins, gullies, scrubland, secondary forest and forest margins.	4	21	No	
Hydrangea *Hydrangea macrophylla*	Deciduous shrub growing to c. 1.5-3 m tall. Spreads from historic settlements and urban areas into scrubland, forest margins and coastal habitats.	4	19	No	
Ice plant *Carpobrotus edulis*	Trailing perennial herb that forms dense mats and excludes indigenous species on sand dunes, cliff faces and also colonises roadways.	6	28	No	
Italian arum *Arum italicum*	Erect tuberous perennial c. 25-60 cm. Forms dense clumps in wetlands, riparian margins and damp places excluding indigenous species.	-	24	No	
Ivy *Hedera helix*	Creeping evergreen vine that can climb to c 30 m. Can form dense carpets suppressing indigenous regeneration as well as smothering canopy trees in forests, shrublands, and disturbed habitats. Also colonises bare ground.	5	25	No	Yes Secondary forest, forest margins
Japanese honeysuckle* *Lonicera japonica*	Vigorous climber smothering canopy trees and small trees and shrubs and suppressing indigenous regeneration. Invades disturbed forests, shrublands, fernland, wetlands and forest margins.	5	31	Yes	Yes Secondary forest
Japanese spindle tree *Euonymus japonicus*	Tree to 6-20 m. Replaces indigenous plants and has potential to form dense colonies in coastal areas and forest margins.	5	19	No	
Japanese walnut *Juglans ailantifolia*	Wide spreading tree to c. 15 m. Escapes from settlements and can replace indigenous species. Often produces dense carpets of seedlings. Invades gullies, forest margins, riparian margins and open areas.	5	21	No	

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Jasmine *Jasminum polyanthum*	A vigorous evergreen climber that smothers mid-canopy and canopy trees and shrubs and can form impenetrable ground cover. Invades disturbed forests, forest margins and shrublands.	5	30	No	Yes Secondary forest
Jerusalem cherry *Solanum pseudocapsicum*	Erect small shrub that forms dense stands and replaces understorey species. Grows in disturbed forest, forest margins, and shady areas.	6	19	No	
Khasia berry *Cotoneaster simonsii*	Deciduous or semi-evergreen shrub c. 4 m. Can form a dominant understorey in forest margins and disturbed habitats.	6	28	No	
Kikuyu grass *Pennisetum clandestinum*	A strong creeping perennial grass that grows rapidly and forms dense mats. Excludes other species and suppress indigenous regeneration. A particular threat to coastal systems.	5	29	No	
Lawson's cypress *Chamaecyparis lawsoniana*	Large, narrow pyramidal tree invading the Volcanic Plateau.	5	26	No	Yes All low-stature habitats
Maritime pine *Pinus pinaster*	Medium-large tree with open crown. Aggressive coloniser in scrubland, shrublands, tussocklands, cliff faces, bare ground and especially the Volcanic Plateau.	4	27	No	
Marram *Ammophila arenaria*	A coarse perennial grass with tough creeping roots. Used extensively to stabilise sand dunes, this species dominates coastal communities and excludes indigenous sand-binding species.	8	32	No	
Mexican daisy* *Erigeron karvinskianus*	Vigorous free-spreading ground cover that inhibits indigenous regeneration in shrublands, herbfields, forest margins, riparian margins, scrubland, cliff faces, and can colonise bare ground.	5	25	Yes	

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Mile-a-minute *Dipogon lignosus*	Climbing perennial herb. Can smother low-growing indigenous species, suppressing regeneration. Grows in disturbed forests and shrublands.	4	26	Yes	
Mist flower *Ageratina riparia*	An erect, sprawling perennial that can grow to c. 1 m tall. Smothers plant communities, suppresses indigenous regeneration and causes instability of steep gullies and streams. Invades scrubland, riparian margins, shrublands, disturbed forests and wetlands.	-	31	No	
Monkey musk *Mimulus guttatus*	Perennial herb c. 60 cm tall. Can form dominant swards in wetlands and stream and lake edges.	6	21	No	
Montbretia *Crocosmia* X *crocosmiflora*	Perennial rhizomatous plant growing to c. 60-90 cm. Montbretia forms dense swards and can exclude indigenous species and suppress regeneration. Spreads rapidly in scrubland, riparian margins and open areas.	6	22	No	
Montpellier broom *Teline monspessulana*	Evergreen shrub to c. 2-5 m tall. Forms dense thickets in scrubland and waste places.	4	25	No	
Onion weed *Allium vineale*	Perennial bulb growing in riparian margins and damp habitats. Forms dense swards and excludes indigenous species.	6	20	No	
Pampas* *Cortaderia* species	A giant perennial clump-forming grass. Highly invasive in wetlands, disturbed forests, shrubland, tussockland, herbfields and coastal cliffs. Pampas can also colonise bare ground and increases fire risk.	6	28	Yes	Yes Sand dunes
Parrots feather *Myriophyllum aquaticum*	A herbaceous, perennial aquatic plant that has both submerged and emergent leaves. Easily spread as broken stems resprout. Changes characteristics of the streams and lakes it infests and can clog drains and irrigation systems.	3	26	Yes	Yes

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Periwinkle *Vinca major*	An erect perennial herbaceous groundcover that forms dense carpets and suppresses indigenous regeneration. Invasive in forest, disturbed forests, shrublands and bare ground.	5	22	No	
Pink ragwort *Senecio glastifolius*	An erect perennial herb invasive in coastal areas, cliff faces, scrublands, river margins and capable of displacing indigenous species in these places.	4	24	No	Yes Sand dunes
Poplar *Populus* spp.	Trees that can grow quickly in scrublands, along river margins and waterways and lakes. Dominates canopy and displaces indigenous species.	5	22	No	
Potato vine *Solanum jasminoides*	A high-climbing vine spreading from settlements and capable of smothering canopy trees and forming carpets in the ground layer, suppressing indigenous regeneration.	-	32	No	
Prickly hakea *Hakea sericea*	A large spreading shrub or small tree. Forms dense invasive stands in scrubland, infertile land, forest margins, cliff faces and hillsides.	-	23	No	
Privet *Ligustrum ovalifolium*	Upright shrub c. 2-5 m. Invades forest margins and can displace indigenous species. Also invades roadsides and waste places.	3	23	No	
Privet, Chinese *Ligustrum sinense*	Tree to less than 6 m. Invades disturbed forest, forest margins, shrublands, and riparian margins. Is capable of displacing indigenous species and replacing canopy trees.	6	25	No	
Privet, common *Ligustrum vulgare*	Small tree that can invade forest fragments, disturbed forest, forest margins and riparian margins. A common hedge plant that is spread by birds. Common privet can displace indigenous species.	6	-	No	

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[14] (Yes/No)	Trans-former species?
Privet, tree* (shining privet) *Ligustrum lucidum*	A tree growing to 20 m+. Invades disturbed forest, shrublands and tussocklands. Capable of replacing canopy trees and displacing indigenous species. Also reputed to cause allergies.	4	32	Yes	
Scots pine *Pinus sylvestris*	A medium-large tree with a flattened crown in older trees. Invasive in wetlands and of particular threat to the Volcanic Plateau.	4	27	No	Yes All low-stature habitats
Shrub balsam *Impatiens sodenii*	Small shrub c.2 m. Dominates in the understorey in coastal areas, disturbed forests, forest margins and scrubland.	3	19	No	
Silver birch *Betula pendula*	Tree to c.25 m spreading from settlements into disturbed habitats, wetland margins and riparian margins. Forms dense stands and displaces indigenous species.	-	27	No	Yes All low-stature habitats
Silver wattle *Acacia dealbata*	Shrub to large tree. Spreads in dry areas and can form dense stands by suckering. Particularly invasive in scrubland and river margins.	6	27	No	Yes All low-stature habitats
Smilax* *Asparagus asparagoides*	Low-climbing, woody perennial vine. Competes with and smothers indigenous species and suppresses regeneration. Invasive in forest, disturbed forest, shrublands, coastal areas and, to a lesser degree, tussocklands.	4	30	Yes	Yes Secondary forest
Spanish broom *Spartium junceum*	Deciduous shrub to c. 3 m. Out-competes indigenous species in scrubland, disturbed forests, forest margins, dry areas and also colonises roadsides.	3	22	No	
Spanish heath *Erica lusitanica*	Erect shrub to c. 2 m. Invades hillsides and infertile areas, producing dense populations, and excludes indigenous species.	4	23	No	
Stinking iris *Iris foetidissima*	A shade-preferring evergreen perennial. Can form dense infestations in forest margins, disturbed forest, riparian margins. Is unpalatable and toxic to stock.	-	25	No	

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Sweet pea shrub *Polygala myrtifolia*	A perennial much-branched shrub up to 2 m bearing purple flowers in clusters at the ends of branches. Can invade coastal scrub and shrublands, coastal forest fragments and coastal cliffs.	3	20	No	
Sycamore *Acer pseudoplatanus*	Monoecious, deciduous tree to c. 20 m tall. Can form dense stands in primary forest, disturbed habitats, forest margins, riparian margins, secondary forest, shrubland, tussockland, fernland and can colonise bare ground and roadsides.	6	27	No	Yes Even in primary forest
Taiwan cherry *Prunus campanulata*	A deciduous, small (3-8 m) spreading flowering cherry with showy bright pink flowers. Current distribution in the Region is unknown. This plant is highly invasive in the north of the North Island. Invades scrub, forest margins and secondary forest.	-	20	No	
Tree lucerne *Chamaecytisus palmensis*	Evergreen shrub-small tree up to 5 m tall. Can form dense stands and establishes in dry open areas, forest margins, in riverbeds, coastal areas, and on hillsides.	6	22	No	
Tree lupin *Lupinus arboreus*	Woody, perennial shrub that can form dense colonies and exclude indigenous species. Establishes in coastal or sandy areas, riverbeds and waste areas.	7	27	No	
Tree mallow *Lavatera arborea*	Biennial shrub 2-3 m usually with a singe main stem. Can form dense stands and is especially invasive in coastal areas.	-	18	No	

Species	Description/Impact	Position on Infestation Curve	Weediness Score	Unwanted Organism Status[11] (Yes/No)	Trans-former species?
Velvet groundsel *Roldana petasitis*	Erect, soft perennial c.1-2 m with large velvety leaves. Can shade out and replace indigenous species and prevent regeneration.	-	24	No	
Velvety nightshade *Solanum chenopodioides*	Perennial herb or sub-shrub c 1.5 m tall. Forms dense colonies in shady areas, scrubland, forest margins, disturbed forest and river and lakesides.	-	Unclassified	No	
Wandering Jew* *Tradescantia fluminensis*	A creeping ground cover that forms dense carpets and suppresses indigenous regeneration. Highly aggressive in forests, disturbed forests, shrublands, wetlands and roadsides.	5	25	Yes	Yes Prevents seedling regenera-tion
Watsonia *Watsonia bulbillifera*	Summer green perennial that forms robust clumps 1.5-2 m in open areas, riparian margins, short-stature habitat and wasteland.	-	17	No	
Western red cedar *Thuja plicata*	A tree with often aromatic, scale-like foliage. Can spread from parent plants into partially open sites and low-stature habitat.	-	-	No	
Wild kiwifruit *Actinidia deliciosa*	Vigorous hairy vine. Can escape from cultivation and invade scrubland, secondary forest and disturbed habitats.	2	Unclassified	No	
Willow-leaved hakea *Hakea salicifolia*	Large erect shrub that forms dense stands in scrublands on infertile land. Excludes indigenous species and increases fire risk.	-	23	No	
Yellow flag iris* *Iris pseudacorus*	A many-flowered, leafy iris with conspicuous yellow flowers on tall stems. Forms clumps and impedes water flow and can invade wetlands, streams, lake edges, water races and drains.	4	21	Yes	

11. NATIONAL PEST PLANT ACCORD

The National Pest Plant Accord (NPPA) is an agreement between regional councils and Government agencies with biosecurity responsibilities. The focus of the NPPA is a list of pest plant species that are banned from sale, distribution or propagation within New Zealand. These species have been declared unwanted organisms under the Act and the NPPA list ensures that sections 52 and 53 apply nationwide. Under the NPPA Horizons will undertake surveillance to prevent the commercial sale and/or distribution of the pest plant species on the Accord.

The NPPA is intended to carry the same effect as a memorandum of understanding and is not a binding contract. However, Horizons is committed to its roles and obligations under the Accord. These include:

- undertaking a routine surveillance programme and actively enforcing restrictions against the sale, distribution or propagation of species on the NPPA
- the provision of sufficient authorised persons to carry out the surveillance, inspection and enforcement programmes
- the provision of advice and information regarding the NPPA to members of the public and commercial interests
- contribution to the development or identification and information packages in support of the Accord.

Regional councils also have a role in reporting on activities under the Accord, participation in a technical working group and consideration of recommendations of the technical working group.

The current NPPA can be found in appendix 1.

Any amendments made to the NPPA during the life of this Strategy will be incorporated into Horizons' obligations under this Strategy. A current list of the NPPA (or its equivalent) will be made available to the public through request to Horizons.

12. SMALL-SCALE MANAGEMENT

Horizons may undertake small-scale management programmes for 'unwanted organisms' under section 100 of the Act. Section 100 enables Horizons to undertake management of a species in the absence of a relevant management strategy.

This method could be used for pest plants not known in the Manawatu-Wanganui Region at the time of writing this Strategy. Provided the criteria of section 100 are met, a newly discovered high-risk species could be controlled without delay, thus avoiding the risk of further spread and establishment of the species.

The ability to be able to respond rapidly to a new risk is a valuable tool and, when appropriate, Horizons may request a chief technical officer to declare a species as 'unwanted' and control the species as per the stipulations of section 100 of the Act.

13. BIOLOGICAL CONTROL

To date, biological control (biocontrol) has shown much promise and some substantial gains have been made using biocontrol agents. Biological control agents may be insects that eat the plant or disease organisms that reduce a pest plant's vigour.

Biocontrol is especially useful for those widespread species with established seedbanks, typically at the high end of the Infestation Curve. Biocontrol agents will only ever reduce infestations, not eradicate species, and should be viewed as a tool to complement other management methods. At its best, biocontrol will produce equilibrium between the populations of pest plant and biocontrol agent at acceptable levels. This will substantially reduce the adverse effects of the pest plant species at an ongoing cost of maintaining control that will be close to zero.

Horizons is committed to using biological control for pest plants wherever practical and will continue to release, propagate and redistribute appropriate biological agents for the control of particular pests.

The pest plants currently targeted for biocontrol are:

- Blackberry
- Broom
- Californian Thistle
- Gorse
- Heather
- Nodding Thistle
- Old Man's Beard
- Ragwort

In addition to the above:

- Horizons may give financial or logistical assistance to research into additional biological control agents for the above or any other pest plant species.
- Should a suitable new biological agent be developed during the duration of the Strategy, Horizons may undertake to release, propagate and redistribute those agents.
- Horizons will continue to encourage collaboration between agencies on biocontrol needs and research directions.
- Horizons will provide training for staff around biocontrol concepts, agents and their identification, distribution and population monitoring.
- Horizons will extend training pertaining to biocontrol to the regional community as required, and provide readily available information on how to attain, release and maintain a population of biocontrol agents.

14. RESEARCH AND TRAINING

The research and technology supporting pest plant management is dynamic and advancing all the time. Horizons is committed to incorporating such advances into operational plans. Research can be obtained and shared in a number of ways.

- Funding research. *Actively pursuing and potentially driving research. Could be funding of graduate student, collaborative investment between several agencies (eg biocontrol research), professional contracts to provide research to better inform management decisions.*
- Maintaining contacts with research institutes (eg Landcare, Massey University, AgResearch). *Active relationship building, two-way relationship - receiving research results but also requesting/guiding direction of future research.*
- Utilising the Internet and subscribing to listservers (both national and international forums on pest plant ecology). *Individual actions, passive, continual upskilling.*
- Continued membership of national institutes (eg BioSecurity Institute) and attendance at regional branch meetings. *Individual upskilling that has direct benefits for Horizons. Maintenance of networks. The annual Biosecurity Institute seminar is the principal meeting for people working in pest plant management including DOC, the research institutes, local government and land care groups.*
- Maintaining contacts with other pest plant managers throughout the country.
- Establishing contacts in Australian research institutes and resource management agencies. *Institutional or individual contacts. Awareness of potential future pest plant species.*

New information needs to be disseminated amongst staff and should be incorporated into training sessions where appropriate. Staff training and upskilling will be an ongoing process, and will be delivered via a mix of active/formal (conferences, workshops, field days) and passive/informal (incorporated into team meetings, delivered via email, self-learning) mechanisms. Areas identified for staff training include:

- regular workshops in plant identification. This will be particularly necessary for surveillance plants and new incursions. *Maintain contacts with botanical skills in Region (herbaria, academic institutes, DOC staff and professional individuals).*
- Field days demonstrating new control methods. *Links to research institutes, herbicide manufacturers, other pest plant managers, experiences overseas.*
- Ecological theory, pest plant ecology, population dynamic theories and how they apply to pest plant management. *Upskilling to keep in line with change in Strategy direction and to incorporate integrated habitat management approach.*
- Upskilling, revision of monitoring methods, good data collection and storage practices, use of databases, spreadsheets and new computer programmes and technology.

15. AWARENESS CAMPAIGNS AND INITIATIVES

15.1 Introduction

With the expected establishment of new pest plant species into the future, the majority of which will originate from gardens, one of the most effective outcomes of this Strategy will be behaviour change. Alerting the community to the issues, threats and solutions could result in more effective pest plant management, in particular in prevention and containment (eg aquatic pest plants) measures.

Awareness campaigns will be targeted towards particular communities or user groups and to particular issues, and will be additional to the provision of advice and information (section 6.2.2).

15.2 Means of Implementation

The communities and user groups that should be incorporated into awareness campaigns include, but are not restricted to:

- nurseries, garden centres and plant retailers (and their customers)
- water user groups (fishing, boating, etc)
- gardening groups, clubs and societies
- lifestyle block owners
- coastal communities
- occupants of new housing developments
- absentee landlords and holiday home owners
- territorial local authorities (parks and amenity plantings)
- historic homestead owners/occupiers
- quarry operations
- transportation companies
- tangata whenua.

Issues that should be addressed by targeted awareness campaigns include:

- informing the public on the RPPMS and the community's roles and responsibilities
- prevention of new incursions/surveillance measures
- encouraging responsible choice of species and gardening practices
- containment of the aquatic pest plants
- the spread of species from urban gardens into the natural areas in the hinterland
- the risks associated with illegal dumping of garden waste.

There are several worthy mechanisms already in place by which to encourage and support behaviour change and they should be continued and enhanced. Details pertaining to individual awareness campaigns will be outlined in the yearly operation plans that stem from this Strategy. Support methods include:

Method: Liaising and combining resources with other resource management agencies who also have an interest in community awareness around pest plant control (eg DOC, Forest and Bird, Fish and Game, tangata whenua).

Target: Horizons continues to be an active member of Weedbusters. Horizons is involved in, and contributes to, national initiatives such as publications (eg Plant Me Instead booklet), national awareness campaigns (eg Stop the Spread) and risk management.

Method: Holding interactive stalls at agricultural field days.

Target: Horizons attends field days (and equivalents) throughout the Region. Stalls could be in conjunction with other agencies or councils.

Method: Assistance to make good gardening choices - including provision of a free green disposal service and assistance with choosing appropriate species.

Target: Horizons to fund garden dumping at Easter, Labour and Anniversary weekends.

Target: Horizons purchases and distributes Plant Me Instead booklets free of charge.

Target: Horizons runs a yearly Swap-A-Plant weekend whereby pest plant species will be traded for native plants (eg one trailer load of pest plant waste can be exchanged for native plants or herbicide).

Target: Horizons holds a yearly plant sale. Indigenous plants will be sold at cost price. Information regarding acceptable exotic plants for the garden will also be available.

Method: Publication or purchase of publications (brochures, pamphlets, booklets, books) that provide information pertaining to the awareness campaign in question in a simple and factual manner.

Target: Publications are shared between, sold to, or purchased from, other agencies and regional councils. Collaborative productions are encouraged. New methods, designs and materials are investigated to keep advocacy publications innovative, eye-catching and contemporary.

Method: Use of the printed and electronic media.

Target: The Communications and Promotions Group of Horizons becomes an integral part of the pest plant management team. Awareness campaigns are supported in the media through information, timely and accurate advertisements, articles, photos and airplay.

16. COMMUNITY GROUP INITIATIVES

The task of pest management is much greater than can be dealt with by one agency alone. In addition to working alongside other resource management agencies, Horizons will harness the will and support of the larger community. Local communities often have the knowledge, community ownership and enthusiasm required for successful pest management and habitat restoration initiatives. Community groups are often well placed to have an effective advocacy role and there is potential for Horizons to incorporate such support into its own advocacy programme. Such initiatives will be encouraged, in line with the Regional policy framework (ONE PLAN methods).

Community care groups may involve a collection of individuals (a community), an organisation or a family or an individual occupier, and be focused on the care of a single site (eg a wetland, forest fragment) or a co-ordinated approach for a single species (eg. old man's beard).

16.1 Means of Implementation

Horizons will, at its discretion, assist and encourage community initiatives through a range of mechanisms. The level of involvement from Horizons will be project-dependent and can include:

- preparation of site (or species) management plans
- assistance with funding applications, or consideration of provision of 'seeding' funds
- assistance with or provision of project management expertise
- provision of written resources that provide direction and training on (for example) pest management, site manipulation and habitat restoration
- provision of materials (eg herbicide, fencing materials, native plants)
- composing codes of practice for specific communities and specific issues, for example:
  - for groups of occupiers of properties adjacent to rivers to attempt to manage the establishment and dispersal of pest plants along river corridors
  - for new subdivisions in close proximity to natural areas specifying desired gardening practices
  - for organic farmers to ensure effective pest plant management is achieved in the absence of herbicide use.

16.2 Performance Measures and Monitoring

Horizons' work will be measured, monitored and reported on as a component of the larger monitoring strategy for the Region and against individual site management plans.

17. CROSS-BOUNDARY ISSUES

As pest plant impacts are not constrained by administrative boundaries, cross-boundary issues will be inevitable. Minimising these issues leads to more effective and efficient pest plant management.

17.1 Means of Implementation

In order to minimise adverse consequences associated with cross-boundary issues, Horizons will:

- pursuant to section 76(4) of the Act, not be inconsistent with any national or regional pest management strategy concerning the same pest, any regulation, or any Regional Policy Statement or regional plan prepared under the Resource Management Act 1991
- participate in collective forums with other regional councils to promote effective pest management
- communicate and consult with neighbouring regional councils in regard to pest plant management in general and cross-boundary issues in particular
- memoranda of understanding between Horizons neighbouring councils will be encouraged where such arrangements will enhance pest plant management for a particular outcome
- make submissions in respect of strategies prepared by neighbouring (and other) regional councils, or documents prepared by other agencies on pest plant management
- liaise with Biosecurity New Zealand over pest plant management issues best dealt with or co-ordinated at the national level
- contribute and/or support new initiatives developed by Biosecurity New Zealand
- liaise with the Ministry for the Environment and the Department of Conservation over national biodiversity issues as they relate to site-led pest plant management.

PART FOUR

ADMINISTRATIVE AND MANAGEMENT PROCEDURES

18. STATUTORY POWERS

To achieve the purpose of the Strategy and to give effect to its objectives and means of achievement, Horizons will use the statutory powers listed in table 18.1.

Authorised persons will exercise many of these powers on behalf of the council. The chief executive, as the principal officer of Horizons, will appoint authorised persons and may delegate powers to any authorised person, subject to sections 103 and 105 of the Act.

Table 18.1: Administrative powers under the Biosecurity Act 1993.

Administrative Powers	Reference in the Biosecurity Act 1993
Powers of Operations Committee of Horizons	
Power to act on default	Section 128
Liens	Section 129
Options for cost recovery	Section 135
Failure to pay	Section 136
Options to undertake a prosecution action	Section 154
Powers of the Chief Executive of Horizons	
The appointment of authorised and accredited persons	Section 103(3) and (7)
Delegation to authorised persons	Section 105
Application of articles or substances from aircraft	Section 114A
Declaration of controlled area	Section 131
Powers of Authorised Person	
Duty to provide information	Section 43
Power to require assistance	Section 106
Power of inspection	Sections 109 and 112
Power to record information	Section 113
General powers	Section 114
Use of dogs and devices	Section 115
Power to seize evidence	Section 118
Power to seize abandoned goods	Section 119

Administrative Powers	Reference in the Biosecurity Act
Power to intercept baggage etc	Section 120
Power to examine organisms	Section 121
Power to apply article or substance to place	Section 121A
Other powers in respect of risk goods	Section 122
Declaration of restricted place	Section 130

19. REGULATORY MANAGEMENT

19.1 Failure to Comply with a Rule

In the event that an occupier fails to comply with any requirement in any Strategy rule included in Part Two of the Strategy, an authorised person of Horizons will:

a. advise the occupier of their non-compliance and direct him or her to take remedial actions; and

b. follow up the initial inspection to confirm what remedial action has been taken and/or identify outstanding requirements.

In circumstances of continued non-compliance, the authorised person will report to the chief executive or his or her delegated subordinate, who in turn may:

c. utilise the administrative and enforcement provisions of the Act (see also section 6.2.3).

19.2 Failure to Comply with a Notice of Direction

Where a Notice of Direction has been given to an occupier under section 122 of the Act, and the occupier has not complied with the requirements of the direction within the time specified, then under section 128 of the Act, Horizons may enter onto the land specified in the Notice of Direction and carry out, or cause to be carried out, such works or measures as are reasonably necessary to meet the requirements of the Notice of Direction (see also section 6.2.3).

19.3 Offences

Horizons will, in appropriate cases, prosecute persons who do not act on directions or requirements issued by authorised persons to give effect to this Strategy.

19.4 Recovery of Costs Incurred

Under section 128 of the Act, Horizons may recover the costs and expenses reasonably incurred by it in carrying out the works and measures as a debt due from the occupier to whom the Notice of Direction was given (see also section 6.2.3).

19.5 Provision for Exemption

Horizons may, upon the written request of an occupier, exempt any person from any requirement in any Strategy rule included in Part Two of this Strategy. Before granting an exemption under section 80D of the Act the chief executive shall be satisfied that:

a. the requirements have been substantially complied with and that further compliance is unnecessary; or

b. the action taken or provision made in respect of the matter to which the requirement relates is as effective as or more effective than actual compliance with the requirement; or

c. the prescribed requirements are clearly unreasonable or inappropriate in the particular case; or

d. events have occurred that make the prescribed requirements unreasonable or inappropriate in the particular case; and

e. that the granting of exemption will not significantly prejudice the attainment of the objectives of this Strategy.

Process: On receipt of any request, Horizons will advise that person within ten (10) working days of its decision whether or not to exempt him or her from any requirements in any Strategy rule included in Part Two of this Strategy. The chief executive will delegate the power to approve exemptions. Regard will be given to:

a. positive soil conservation effects of pest plants in erosion prone sites;

b. regeneration of indigenous plant species;

c. prevention or mitigation of flood damage;

d. effective suppression of the pest plant through grazing or hedge maintenance;

e. the pest being used for valid scientific research;

f. the pest being used for approved herbal use; or

g. where two occupiers with a common boundary agree that boundary control of a pest plant is not necessary (exemption would only apply to broom, gorse, Australian sedge, blackberry, variegated thistle, ragwort and nodding thistle).

A register of exemptions will be maintained for public inspection.

20. FUNDING THE STRATEGY

Section 80A of the Act requires certain funding information be contained in a Regional Pest Management Strategy. Under Part VII of the Local Government Act 1974, the council must comply with financial management provisions and principles, in particular, to adopt a funding policy for all of its functions.

Apart from being a legislative prescription, the development and adoption of a funding policy provides greater transparency, equity and accountability in Horizons' charges for the services it provides.

Council adopted its funding policy on 14 March 2006. The legislation requires that a funding policy be adopted every three years. Thus a review will be required prior to the adoption of a new policy in 2009.

The key features of the funding policy for the Regional Pest Plant Management Strategy are proposed as follows:

- region-wide funding (eg General Rate) for managing the Strategy
- General Rate for all measures of public benefit relating to environmental pest plant species
- a combination of the General Rate (30%), a Uniform Annual Charge on properties less than 4 ha in size (10%), and a per hectare rate on properties over 4 ha in size (60%) for the costs relating to production pest plant species
- occupiers largely responsible for total control and boundary control of production pests
- non-compliers will be charged for enforcement costs
- full cost recovery for private operational activities.

The cost to ratepayers of the Strategy is $1,721,848. Details are shown in appendix 2.

Further details of the funding policy are contained in the 2006-2009 revenue and financing policy contained within the council's 2006 Community Plan.

21. REVIEW OF THE STRATEGY

A review of the Strategy will be carried out in the following circumstances:

If Horizons has reason to believe that:

a. the Strategy is failing to achieve its purposes

b. new issues have arisen with respect to other harmful plants, or regional monitoring shows a significant change in an existing issue or shows that a review would otherwise be appropriate

c. the Strategy is due to expire in less than 12 months.

A full review will be conducted no later than five years after the date upon which this Strategy becomes operative (as required by the Act and within the meaning of section 88 of the Act). The procedures to be used to review the Strategy will be determined at that time, and will include (as part of a review programme):

a. an assessment of how well Strategy objectives were achieved

b. an assessment of the impact designated pest plants have had on the Region, and whether any other harmful plants should be considered for inclusion in the Strategy

c. formal and informal liaison with public authorities and key interest groups regarding the effectiveness of the Strategy

d. assessing whether to notify a proposal for another Regional Pest Plant Management Strategy under section 78 of the Act.

Horizons may make minor amendments to the Strategy at any time by resolution without a review of the Strategy in accordance with section 88 of the Act. Minor amendments can only be made if Horizons is satisfied that the amendment will not have any significant effect on the rights and obligations (including costs) of any person (section 88A(4)).

DEFINITION OF TERMS

Definitions of terms used in this Strategy are split into two sections:

1. General Terms
2. Botanical Terms

General Terms

Terms marked with an asterix (*) are defined in the Biosecurity Act 1993. Terms marked with a hash (#) are defined in the Resource Management Act 1991.

Act	The Biosecurity Act 1993.
Adventive	Not native to New Zealand.
Authorised person*	A person appointed an authorised person under section 103 of the Act.
Beneficiary	The receiver of benefits accruing from the implementation of a pest plant management measure of the Strategy.
Biological Control (Biocontrol)	The use of organisms (insects, rusts or other organisms) that attack pest plants without harming other species.
Biological Diversity (Biodiversity)	The variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.
Binomial name	The two name taxonomic nomenclature given to plant species (ie Genus species).
Chief Technical Officer*	A person appointed a chief technical officer under section 101 of the Act.
Control Area	The defined area within the region where a particular plant is controlled to Zero-density. Control Areas only apply to species managed under a Containment objective.
Costs and Benefits*	Costs and benefits of any kind whether monetary or non-monetary.
Crown land	Land vested in the Crown and administered by a Minister, and includes all land forming part of any national park, any reserve within the meaning of the Reserves Act 1977, and all unoccupied lands of the Crown.
Distinctiveness	Refers to unusual or uncommon features, species or populations in a given location.
District Council	A district council constituted under Part 1A of the Local Government Act 2002.
Ecological context	The connectivity of a given site with the surrounding landscape and ecological processes.
Ecosystem	A defined community of all plants, animals and micro-organisms, the physical and climatic environment and the interactions and processes between them.

Endemic	A species that is indigenous only to New Zealand.
Enforce	To compel observance with the law.
Exacerbator	A person who, by their actions or inaction, contributes to the creation, continuance, or exacerbation of a particular pest plant management problem.
Exotic	A species, subspecies or lower taxon occurring outside of its natural range (past or present) and dispersal potential.
Functional intactness	The extent to which natural processes and systems within an ecosystem remain intact.
Habitat	The place or type of place where an organism or population normally lives. A description for areas that are similar to each other but different from others.
Hapu	A social, political unit comprised of whanau (extended families) each recognising descent from a common ancestor.
Indigenous	A species, subspecies or lower taxon, occurring within its natural range (past or present) and dispersal potential.
Introduced	A species brought from its natural range to New Zealand by a human agency.
Iwi	A political grouping comprised of several hapu, each recognising descent from a common ancestor(s). The hapu not only recognise genealogical ties but geographical, political and social ties. Today iwi are represented by many organisations, including trust boards, runanga, iwi authorities etc, but only in specific areas where the mandate to do so has been given by the constituent hapu.
Kaitiaki	Spiritual or physical guardian, protector.
Kaitiakitanga	The exercise of guardianship by the tangata whenua of an area in accordance with tikanga Maori in relation to natural and physical resources; and includes the ethic of stewardship.
Karioi Forest	Means the area known as Karioi Forest and included under the following Certificates of Title WN1300/4, WN1300/16 and WN133/17.
Karioi Forest Balance Area	Means the Karioi Forest excluding those areas that fall within the definition of the Karioi Forest Seed Source Area or Karioi Forest Mixed Species Plantation Area.
Karioi Forest Mixed Species Plantation Area	Means the areas within Karioi Forest as identified on figure 8.5, comprising green contorta (*Pinus contorta* var. *contorta*) in assosiation with *Pinus radiata* or *Pinus nigra* var. *laricio.*
Karioi Forest Seed Source Area	Means the areas within Karioi Forest as identified on figure 8.5 comprising, mature stands of green contorta *(Pinus contorta* var. *contorta).*

Principal Officer*	a) in relation to a regional council, its chief executive; and b) in relation to a region, the chief executive of the region's regional council and includes an acting chief executive.
Property Boundary	Legal boundary that divides one property from another (usually associated with different owners).
Rarity	The presence of species that are uncommon at a particular spatial scale.
Region	The term Region (with a capital 'R') refers to the Manawatu-Wanganui Region over which Horizons has jurisdiction as determined in accordance with the Local Government Act 1974.
Regional Council	A regional council constituted under Part 1A of the Local Government Act 2002.
Representativeness	The degree to which a given habitat is representative of habitat type present at some time in the past.
Resilience	A measure of vulnerability of a site to disturbance and invasion by pests.
Service Delivery	Works conducted by Horizons with no direct cost to the property owner.
Stakeholders	The beneficiaries and exacerbators identified in this Strategy as bound by and contributing to the Strategy.
Significant	In relation to indigenous biological diversity means areas of significant indigenous vegetation and significant habitats of indigenous fauna.
Site-led	A programme that focuses on protecting certain values at certain sites.
Species-led	A proactive programme, concentrating on a specific species throughout the Region.
Strategy	(With a capital 'S') refers to this document - Horizons Regional Pest Plant Management Strategy.
Sustainability	The ability for a site, habitat or ecosystem to sustain itself and ecological function over time.
Surveillance	The active searching for new incursions of invasive pest plants.
Territorial Local Authority	A district or city council.
Transformer species	A species that is capable of completely modifying the habitat it invades making it unsuitable for virtually all other species that formerly occupied it.
Tangata whenua	In relation to a particular area, means the iwi, or hapu, that holds mana whenua# (customary authority exercised by an iwi or hapu in an identified area) over that area.
Taonga	Treasures, entities (living and inanimate) with great value.

Viability	Measure of ability to retain functional intactness over time.
Waahi-tapu sites	Sacred site, sanctuary.
Working Day*	Means any day except - a) a Saturday, a Sunday, Good Friday, Easter Monday, Anzac Day, Labour Day, the Sovereign's birthday, and Waitangi Day; and Wellington Anniversary Day; and b) a day in the period commencing on the 20th day of December in any year and ending with the 15th day of January in the following year.

Botanical Terms

Annual	A species completing its life cycle within one year.
Ascending	Directed upwards, usually at a sharp angle.
Biennial	Living usually two years and dying in the second.
Deciduous	Shredding leaves at the end of the growing season.
Dioecious	Having male and female flowers on separate plants of the same species.
Elliptic	In the shape of an ellipse, rounded at both ends, widest in the middle.
Entire	With a continuous margin completely lacking teeth.
Erect	Vertical, upright.
Evergreen	Retains leaves throughout the year.
Inflorescence	A general term for the branch system on the floral axis, or for the arrangement of flowers within this.
Monoecious	Male and female flowers present on the same plant.
Ovate	Egg-shaped, attached at the broad end.
Panicle	Branched inflorescence with flowers on individual stalks.
Perennial	A species with a life span of greater than two years.
Petiole	Stalk of a leaf.
Pinnate	Leaf with leaflets arranged on either side of a petiole.
Prostrate	Growing flat along the ground.
Recurved	Curving backward or downward.
Rhizome	An underground stem, usually spreading more or less horizontally.
Rhizomatous	A plant with rhizomes.
Seed-bank	Seed accumulated in the soil.
Seed-rain	The accumulation of seed present in the air.
Scandent	Climbing, usually with special climbing organs.

Shrub	Woody plant with many stems and lacking a distinct trunk.
Whorl	An arrangement of three or more parts at the same level around an axis (eg leaves around a petiole).

Abbreviations

CBD	Convention on Biodiversity
DOC	Department of Conservation
GDP	Gross Domestic Product
Landcare	Manaaki Whenua Landcare Research
NPPA	National Pest Plant Accord
NZBDS	New Zealand Biodiversity Strategy
NZBSS	New Zealand Biosecurity Strategy
RMA	Resource Management Act 1991
RPPMS	Regional Pest Plant Management Strategy
TLA	Territorial Local Authority

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Web Sites

IUCN (The World Conservation Union) Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species:
http://iucn.org/themes/ssc/pubs/policy/invasivesENG.htm

The New Zealand Biodiversity Strategy:
http://www.biodiversity.govt.nz/pdfs/picture/nzbs-whole.pdf

The Biosecurity Strategy for New Zealand:
http://www.maf_govt.nz/biosecurity-strategy

Unwanted organisms list:
http://www.biosecurity.govt.nz/pests-diseases/registers-lists/unwanted-organisms/

Appendix 1: National Pest Plant Accord

Scientific Name	Common Name/s
Acmena smithii	Monkey apple
Ailanthus altissima	Tree of heaven, tree from hell, lacquer tree, copal tree, varnish tree, Ailanthus, rotting carrion tree, baked sewage tree, kerosene tree
Akebia quinata	Akebia, chocolate vine, five-leaved akebia
Alternanthera philoxeroides	Alligator weed, alligatorweed, pigweed
Anredera cordifolia	Madeira vine, mignonette vine
Araujia sericifera	Moth plant, cruel plant, white bladder flower
Aristea ecklonii	Aristea
Arundo donax	Giant reed, arundo grass
Asparagus asparagoides	Smilax, bridal creeper
Asparagus densiflorus	Bushy asparagus, fern asparagus, emerald feather, Sprengeri fern, Sprenger's asparagus, foxtail fern, possum tail
Asparagus scandens	Climbing asparagus
Berberis darwinii	Darwin's barberry
Bomarea caldasii	
Bomarea multiflora	Bomarea, climbing alstromeria
Bryonia cretica	White bryony
Calluna vulgaris (excluding double-flowered cultivars)	Heather, ling
Cardiospermum grandiflorum	Balloon vine
Cardiospermum halicacabum	Balloon vine
Carpobrotus edulis and hybrids	Iceplant
Celastrus orbiculatus	Climbing spindleberry, oriental bittersweet
Ceratophyllum demersum	Hornwort, coontail
Cestrum parqui	Green cestrum
Chrysanthemoides monilifera	Boneseed
Clematis flammula	Clematis, plume clematis, fragrant clematis, virgin's bower, fragrant virgin's bower, sweet-scented virgin's bower
Clematis vitalba	Old man's beard

Finalised July 2006. Species in red have 12-month exemptions, species in blue have 24-month exemptions.

Scientific Name	Common Name/s
Cobaea scandens	Cathedral bells
Cortaderia jubata	Purple pampas grass
Cortaderia selloana	Pampas grass
Cotoneaster simonsii	Khasia berry
Cotyledon orbiculata	African pig's ear, stonecrop
Crassula multicava	Pitted crassula, fairy crassula
Cyathea cooperii	Lacy tree fern, Australian tree fern
Dipogon lignosus	Mile-a-minute
Drosera capensis	Cape sundew
Eccremocarpus scaber	Chilean glory creeper, Chilean glory vine, glory vine, Chilean glory flower
Egeria densa	Egeria, oxygen weed, Brazilian elodea
Ehrharta villosa	Pyp grass
Eichhornia crassipes	Water hyacinth
Eomecon chionantha	Snow poppy, poppy of the dawn, Chinese bloodroot
All species in *Equisetum* genus	Horsetail
Eragrostis curvula	African love grass
Erigeron karvinskianus	Mexican daisy
Euonymus japonicus	Japanese spindle tree
Ficus rubiginosa	
Fuchsia boliviana	
Galeobdolon luteum	Aluminium plant, artillery plant
Gunnera tinctoria	Chilean rhubarb
Gymnocoronis spilanthoides	Senegal tea, temple plant, costata
Hedychium flavescens	Yellow ginger
Hedychium gardnerianum	Kahili ginger
Heracleum mantegazzianum	Giant hogweed, cartwheel flower, wild parsnip, wild rhubarb
All species in Hieracium genus	Hawkweed

Finalised July 2006. Species in red have 12-month exemptions, species in blue have 24-month exemptions.

Scientific Name	Common Name/s
Homalanthus populifolius	Queensland poplar, bleeding heart tree, poplar leaved omalanthus
Homeria collina	Cape tulip
Houttuynia cordata	Chameleon plant
Hydrilla verticillata	Hydrilla
Hydrocleys nymphoides	Water poppy
Hypericum androsaemum	Tutsan, sweet amber
Ipomoea indica	Blue morning glory
Iris pseudacorus	Yellow flag, yellow flag iris
Jasminum humile	Italian jasmine, yellow jasmine, Italian yellow jasmine, yellow bush jasmine
Lagarosiphon major	Lagarosiphon, oxygen weed
Lantana camara	Lantana
Ligustrum lucidum	Tree privet
Lilium formosanum	Formosa lily, trumpet lily, St Joseph's lily, Taiwan lily
Lonicera japonica	Japanese honeysuckle
Ludwigia peploides	Primrose willow, floating primrose willow, water primrose
Lythrum salicaria	Purple loosestrife
Macfadyena unguis-cati	Cat's claw creeper, cat's claw vine, cat's claw ivy, yellow trumpet vine
Menyanthes trifoliata	Bogbean
Myoporum insulare and hybrids	Tasmanian ngaio
Myrica faya	Fire tree, candle-berry myrtle
Myricaria germanica	False tamarisk
Myriophyllum aquaticum	Parrots feather, thread of life, Brazilian watermilfoil
All species in Nassella genus	
Nephrolepis cordifolia	Tuber ladder fern
Nuphar lutea	Yellow water lily, spatterdock, cow lily, brandybottle
Nymphaea mexicana	Mexican waterlily, banana waterlily

Finalised July 2006. Species in red have 12-month exemptions, species in blue have 24-month exemptions.

Scientific Name	Common Name/s
Nymphoides geminata	Marshwort, entire marshwort
Nymphoides peltata	Fringed water lily
Ochna serrulata	Mickey mouse plant
Osmunda regalis	Royal fern
Panicum maximum	Guinea grass, green panic, buffalo grass
Passiflora caerulea	Blue passion flower
Passiflora tarminiana	Northern banana passionfruit
Passiflora tripartita	Banana passionfruit
All species in Pennisetum genus (excluding P. clandestinum and P. glaucum)	(excluding Kikuyu grass and pearl millet)
Phragmites australis	Phragmites
Pinus contorta	Lodgepole pine
Pistia stratiotes	Water lettuce
Pittosporum undulatum	Australian cheesewood, Victorian box, mock orange, sweet pittosporum, New Zealand daphne, Victorian laurel, orange pittosporum, wild coffee, Australiese kasuur, soet pittosporum
Plectranthus ciliatus	Plectranthus, blue spur flower
Polygala myrtifolia (excluding Grandiflora)	Sweet pea shrub, sweet pea bush, myrtle-leaf milkwort
Potamogeton perfoliatus	Clasped pondweed
Prunus serotina	Rum cherry
Pyracantha angustifolia	Firethorn, orange firethorn, yellow firethorn
Reynoutria japonica	Asiatic knotweed, German sausage, Japanese knotweed, Mexican bamboo
Reynoutria japonica x sachalinensis	
Reynoutria sachalinensis	Giant knotweed
Rhamnus alaternus	Evergreen buckthorn
Rhododendron ponticum	Rhododendron, wild rhododendron, pontic rhododendron, pontian rhododendron
Sagittaria montevidensis	Arrowhead, sagittaria, Californian arrowhead
Sagittaria platyphylla	Sagittaria, delta arrowhead

Finalised July 2006. Species in red have 12-month exemptions, species in blue have 24-month exemptions.

Scientific Name	Common Name/s
Sagittaria sagittifolia	Arrowhead
Salix cinerea	Grey willow, pussy willow, grey sallow
Salix fragilis	Crack willow
Salvinia molesta	Salvinia, Kariba weed
Schinus terebinthifolius	Christmas berry, Brazilian pepper tree
Schoenoplectus californicus	Californian bulrush
Selaginella kraussiana	Selaginella, African club moss
Solanum marginatum	White-edged nightshade
Solanum mauritianum	Wild tobacco tree, tobacco nightshade, woolly nightshade, tobacco weed, kerosene plant, flannel plant
Tradescantia fluminensis	Wandering Jew
Tropaeolum speciosum	Chilean flame creeper
Tussilago farfara	Coltsfoot
Typha latifolia	Great reedmace, cumbungi, common cattail
Utricularia arenaria	
Utricularia gibba	Bladderwort, humped bladderwort
Utricularia livida	
Utricularia sandersonii	
Vallisneria gigantea	Eelgrass
Vallisneria spiralis	Eelgrass
Zantedeschia green goddess	
Zizania latifolia	Manchurian wild rice, Manchurian ricegrass

Finalised July 2006. Species in red have 12-month exemptions, species in blue have 24-month exemptions.

Appendix 2: Funding Policy

Proposed allocation to outputs for pest plant management are presented below.

Area of Output	Total $
Environmental Pest Plants - zero-density, containment	701,144
Production Pest Plants - management of programme, enforcement, zero-density	468,666
Surveillance Programme	78,502
Site-led Programme	226,668
Biocontrol Programme	149,623
Monitoring of National Pest Plant Accord	24,421
Awareness Campaigns and Initiatives	51,273
Provision of Advice	21,551
Total $:	1,721,848

INDEX

horizons
regional council

Private Bag 11 025
Manawatu Mail Centre,
Palmerston North, 4442

T 0508 800 800
F 06 952 2929
help@horizons.govt.nz
www.horizons.govt.nz