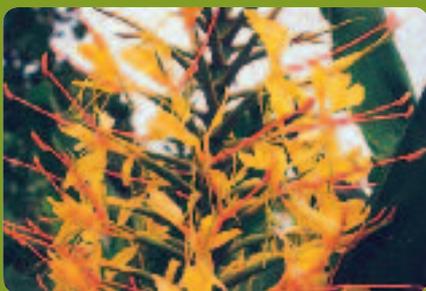


Northland Regional Pest Management Strategies 2010-2015

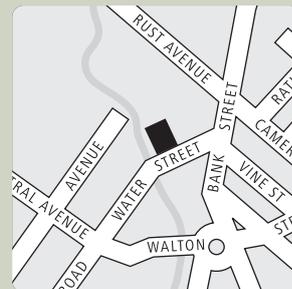


Putting Northland first

DIRECTORY

Main Office

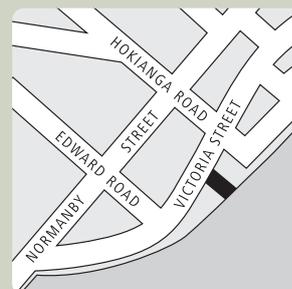
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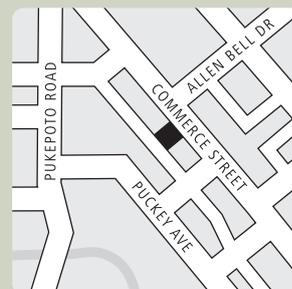
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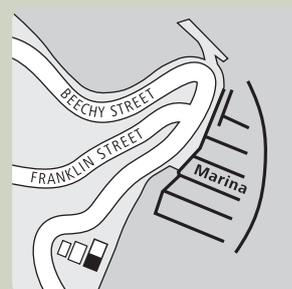
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ŌPUA

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FOREWORD	2	5. ANIMAL PEST MANAGEMENT STRATEGY	44
1. INTRODUCTION	3	5.1 Exclusion Animals	45
1.1 Purpose of Strategies	3	5.2 Eradication Animals	49
1.2 Objective of Strategies	3	5.3 Containment Animals	50
1.3 Management Agency	3	5.4 Suppression Animals	53
1.4 Duration of Strategies	3	5.5 Risk Assessment Animals	65
1.5 Area of Effect	3	6. MARINE PEST MANAGEMENT STRATEGY	66
2. PEST MANAGEMENT ROLES	5	6.1 Marine Exclusion Pests	67
2.1 The Northland Regional Council	5	6.2 Marine Suppression Pests	70
2.2 Public	5	6.3 Marine Community Pest Control Area Pests	73
2.3 Individuals (Landowners/Occupiers)	5	6.4 Marine Risk Assessment Pests	74
2.4 Territorial Authorities	5	7. REGULATORY MANAGEMENT	75
2.5 The Crown	5	7.1 Biosecurity Act Powers	75
2.6 Roothing Authorities	5	7.2 Authorised and Accredited Persons	75
2.7 Rail Corridor Occupiers	5	7.3 Offences	75
3. PEST MANAGEMENT	6	7.4 Exemption Provisions	75
3.1 Invasion Curve	6	7.5 Policy Enforcement	76
3.2 Pest Classifications	6	8. RELATIONSHIP TO OTHER STRATEGIES	77
3.3 Pest Management Methods	7	9. EFFECTS OF IMPLEMENTING THE STRATEGIES	78
3.4 Monitoring	8	9.1 Effects on Māori	78
4. PLANT PEST MANAGEMENT STRATEGY	11	9.2 Effects on the Environment	78
4.1 Exclusion Plants	12	9.3 Effects on marketing of New Zealand products overseas	78
4.2 Eradication Plants	18	10. FUNDING	79
4.3 Containment Plants	26	10.1 Beneficiaries and Exacerbators	79
4.4 Suppression Plants	35	10.2 Funding Sources and Rationale	79
4.5 Community Pest Control Area (CPCA) Plant Pests	41	10.3 Cost Recovery	79
4.6 Risk Assessment Plant Pests	43	10.4 Compensation	79
		10.5 Identification of Unusual Administrative Costs	79

This is a true and correct copy of the Regional Pest Management Strategies for Northland.

This document has been prepared by the Northland Regional Council in accordance with the requirements of the Biosecurity Act 1993.

The Strategies were adopted at a meeting of the Northland Regional Council on 20 July 2010 and are operative from this date.

The Common Seal of Northland Regional Council was affixed on 20 July 2010.



Mark Farnsworth
Chairman

Ken Paterson
Chief Executive Officer

Councillor Craig Brown
Chairman Environmental Management Committee



Mark Farnsworth
Chairman

The Northland Regional Pest Management Strategies (RPMS) are the culmination of a comprehensive review of the way in which introduced pests are managed in Northland. The new Northland Regional Council Strategies cover a broad suite of plants and animals, and introduce a new category, marine pests. They aim to 'future-proof' pest management and reduce the impact that pests are having on our region's economic, environmental and cultural values.

Northland faces new and increasing biosecurity challenges. There are constant new pest threats as well as established pests that require ongoing management. In addition, a growing number of landowners are becoming involved in Community Pest Control Schemes (CPCAs) and are leading more multi-species, site-led control of unwanted pests.

In the face of these challenges the Northland Regional Council has shifted its strategic approach to pest management. Management strategies have been developed to address new pest threats while providing for more flexible management of existing pests.

Underpinning this approach is a desire to sustain the good progress that private landowners have already made and to foster greater involvement from both the Crown and other stakeholders. This approach will help sustain both pest-led and community-driven pest control.

It's an exciting time to be working alongside private landowners, many of whom are leading the way in environmental protection. Many current initiatives on private land are now at the stage where the environment is recovering from the effects of pests because of the commitment and determination of individuals and community groups. The Strategies allow for a more integrated approach to support this sort of restoration work.

Similarly, Northland's coastal marine environment is of significant economic benefit to the region. Our coast is integral to the lives of all Northlanders in terms of cultural, recreational, biodiversity and social values. The new Marine Pest Management section of the Strategies is a comprehensive approach to addressing the growing risks increasing numbers of marine pest invaders pose to Northland's marine environment.

The marine section of the Strategies aims to protect our regional interests and reflects the Council's commitment to working to develop partnerships with all major stakeholders including iwi, the Ministry of Fisheries, Department of Conservation, MAF Biosecurity NZ, industry and the wider community – a process that's encouraged throughout all the sections of the RPMS.

The RPMS sorts pests into five categories: exclusion, eradication, containment, suppression, and risk assessment. Each category has a set of management tools which will allow the Regional Council to protect the gains already made while including several new plant and animal pests and expanding on the CPCAs.

Pests grouped within each category are also listed together with those that have the same management techniques. A description and photograph is provided for every pest within the category to help identify them.

There are two main themes throughout the Strategies: the more traditional approach of species-led management using biological practices to target specific pests; and the site-led work of the CPCAs.

To make it clearer where pest control will occur, the Strategies include maps. These show where pest-led work will happen and will be a valuable tool for the Regional Council, community groups, industry stakeholders and individuals to assess the scope of any pest management project. They will also be used to measure performance, gauging the effectiveness of management techniques and therefore any possible future modifications.

The Regional Pest Management Strategies come after lengthy consultation with the public, interest groups and industry stakeholders. Input from appropriate government agencies and current scientific research has also been incorporated.

The next step is to implement the Strategies and continue to work with our community to protect Northland's environment for future generations – putting Northland first to create a region of choice.



Ken Paterson
Chief Executive Officer



Councillor Craig Brown
Chairman Environmental Management Committee

1. INTRODUCTION

The primary mechanisms available to the Northland Regional Council (NRC) for the control of pests are Regional Pest Management Strategies which are developed under the Biosecurity Act 1993.

Under the Biosecurity Act, Regional Councils are the agencies responsible for processing and approving regional pest management strategies. While Regional Councils have no statutory obligation to undertake pest management, most have significant roles in this field. The Biosecurity Act prescribes the process to be followed in the preparation, subsequent implementation and review of pest management strategies.

Each organism included in the Strategies is capable of causing a serious, adverse and unintended effect in the region on one or more of the following:

1. Economic wellbeing; or
2. The viability of threatened species of organisms, the survival and distribution of indigenous plants or animals, or the sustainability of natural and developed ecosystems, ecological processes, and biological diversity; or
3. Soil resources or water quality; or
4. Human health or enjoyment of the recreational value of the natural environment; or
5. The relationship of Māori and their culture and traditions with their ancestral lands, waters, sites, wāhi tapu, and taonga.

The NRC also has responsibilities under the Resource Management Act 1991 (RMA) to sustainably manage the natural and physical resources of the region, including the Coastal Marine Area (CMA). These responsibilities include sustaining the potential of natural and physical resources, safeguarding life-supporting capacity and protecting environmentally significant areas and habitats (s5(2) and 6(c)).

The RMA specifies functions of Regional Councils in relation to maintenance and enhancement of ecosystems in water bodies in the CMA in the region (s30(1)(c)(iiiia)), the control of actual or potential effects of use, development or protection of land (s30(1)(d)(v)) and the establishment, implementation and review of objectives, policies and methods for maintaining indigenous biological diversity (s30(1)(ga)).

The Regional Policy Statement for Northland identifies the following objectives, which are relevant to the management of pests:

- The avoidance, remedying or mitigation of the adverse effects of pest plants and pest animals on the use of land¹, including its potential for primary production and natural ecosystems (*Objective 20.3.4*).
- Maintenance of the biodiversity of the Northland region (*Objective 23.3.1*).
- Protection of the life supporting capacity of ecosystems through avoiding, remedying or mitigating (in that order of priority) the adverse effects of activities, substances and introduced species on the functioning of natural ecosystems (*Objective 23.3.2*).

¹ The Resource Management Act defines land to include land covered by water.

1.1 Purpose of Strategies

The purpose of the Regional Pest Management Strategies (RPMS) is to provide a strategic and statutory framework for the efficient and effective management of pests in Northland.

1.2 Objective of Strategies

The primary objective of the Strategies is to reduce or eliminate the impact of introduced pests on environmental, economic and social values.

Long-term management of pests extends far beyond simply controlling those that currently infest the region. It also includes management to reduce susceptibility to infestation by pests, control operations to prevent reinvasion and to control the mechanisms by which pests enter and are spread within the region.

In association with the NRC policy of empowering local people to assume ownership of local problems and the solutions to those problems, the NRC will promote integrated pest management operations by way of 'Community Pest Control Areas'.

1.3 Management Agency

The management agency for the Plant, Animal and Marine Pest Management Strategies is the Northland Regional Council.

1.4 Duration of Strategies

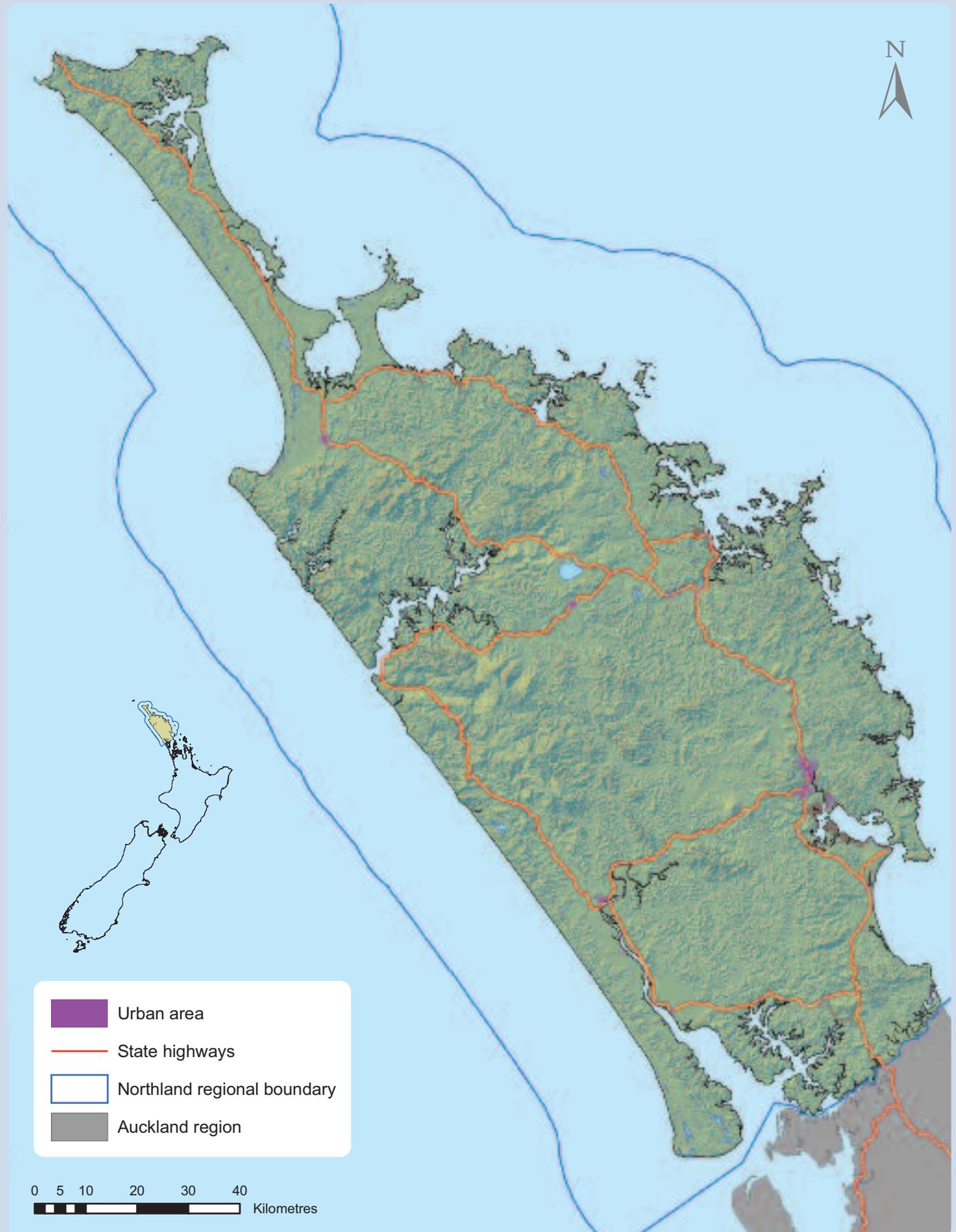
The Strategies will take effect from the date adopted by resolution of the NRC and will remain in force for five years from that date.

1.5 Area of Effect

The Strategies apply to the entire Northland region. The Northland region (Figure 1, overleaf) refers to the land, rivers, lakes and coastal marine area that lie within the administrative boundaries of the Northland Regional Council.

INTRODUCTION

Figure 1: Northland region.



2. PEST MANAGEMENT ROLES

A number of agencies and individuals have responsibilities for pest management. These are generally set out by the Biosecurity Act. The following parties, in addition to the NRC, have been identified and are of relevance in the management of pests:

- The public.
- Individuals (including landowners, occupiers and those who occupy the CMA).
- Territorial authorities.
- The Crown.
- Roothing authorities.
- Rail corridor occupiers.

2.1 The Northland Regional Council

The NRC is involved in pest management to give expression to local community interests, to promote the social, economic, environmental and cultural wellbeing of communities in the present and for the future; and to reflect regional variations in pests, pathways and environments. Regional Councils also carry out devolved functions where best placed to achieve national outcomes. The NRC is the management agency responsible for implementing these Regional Pest Management Strategies.

2.2 Public

The public has an interest in reducing the impacts of pests. Public awareness, behaviour, participation and support are fundamental to effective pest management. Ultimately, central and local government are accountable to national and local communities.

2.3 Individuals (Landowners/Occupiers)

Pest management is an individual's responsibility in the first instance because generally occupiers contribute to the pest problem and in turn benefit from the control of pests. The term occupier has a wide definition under the Biosecurity Act and includes:

- a. In relation to any place physically occupied by any person, means that person; and
- b. In relation to any other place, means the owner of the place; and
- c. In relation to any place, includes any agent, employee, or other person acting or apparently acting in the general management or control of the place.

Under the Biosecurity Act, place includes: any building, conveyance, craft, land or structure and the bed and waters of the sea and any canal, lake, pond, river or stream.

In aquatic environments, pest problems are more likely to arise through transient activities, such as vessel movements. The public/individual generally has a limited ability to identify and respond to aquatic pests in many cases.

2.4 Territorial Authorities

There are three territorial local authorities in the Northland region:

- Far North District Council.
- Kaipara District Council.
- Whāngārei District Council.

Territorial local authorities are required to control pests on land that they occupy in accordance with the rules of the Strategies. Where relevant the NRC believes there is benefit in developing management plans with territorial local authorities to limit the spread of pests and facilitate effective pest management.

2.5 The Crown

The Crown has an interest in protecting the national interest, ensuring the pest management system is equitable, efficient and achieves the best overall outcomes for New Zealand and delivers public services. The Crown also has obligations under the Treaty of Waitangi and international treaties. The Crown is also a landowner and protects the public's interest in the land of the Crown.

2.6 Roothing Authorities

The construction and maintenance of roads can exacerbate pest problems by creating establishment sites and by spreading pests via machinery, equipment and materials. Roads are recognised as corridors for the spread of pest plants, while the construction and maintenance of bridges and structures in water bodies can introduce marine or freshwater pests. The Biosecurity Act allows the option of making either rooothing authorities or neighbouring landowners responsible for road verge pest control.

In Northland the responsibility for roadside verge control for all formed roads will be the responsibility of the rooothing authority, in common with other pest management strategies in New Zealand. Responsibility for pest control on unformed roads will lie with the land occupier who physically occupies the land. The NRC believes there is benefit in developing management plans with road controlling authorities to limit the spread of pests and facilitate effective pest management.

2.7 Rail Corridor Occupiers

Rail corridors can exacerbate pest problems by creating establishment sites and by spreading pests via machinery, equipment and materials. Rail corridors also act as pathways for the spread of pest plants, while the construction and maintenance of bridges and other structures in water bodies can introduce and spread marine or freshwater pests. The NRC believes there is benefit in developing management plans with rail corridor occupiers to limit the spread of pests and facilitate effective pest management.

3. PEST MANAGEMENT

Classifying pests into categories makes it easier to understand the potential risks and impacts of those pests. The NRC has used an 'invasion curve model' to help classify pests and guide decision making on pest management options.

3.1 Invasion Curve

The invasion curve is a simple descriptive model (Figure 2; derived from Williams, 1997) that demonstrates basic pest population dynamics and can be used to help guide strategy objectives and management programmes for individual pests. There is a strong relationship between where a pest sits on the invasion curve and the likelihood of controlling it.

The invasion curve has four stages which can be explained as follows:

1. **Absent:** these pests have not yet established in Northland, or all known sites have been eradicated. The most effective form of management is to continue to exclude them.
2. **Lag stage:** this is the initial slow establishment stage. Pest numbers are low, the rate of population increase is slow and distribution is limited. The most cost effective option during this stage may be eradication, to prevent further establishment.
3. **Explosion stage:** the explosion stage occurs once a pest has adapted to its environment and has reached a population base that allows rapid growth in population size and range. At this stage it is not realistic or cost effective to eradicate the pest, but it may be possible to prevent further spread through containment.
4. **Established stage:** this stage occurs when the rapid growth in population size and range slows as the pest fills most of its available habitat. At this stage, pests can only be suppressed to mitigate their impacts.

3.2 Pest Classifications

The following pest classifications describe the various pest management approaches to be used in Northland. These classifications are generally based upon where a pest sits on the invasion curve.

Exclusion

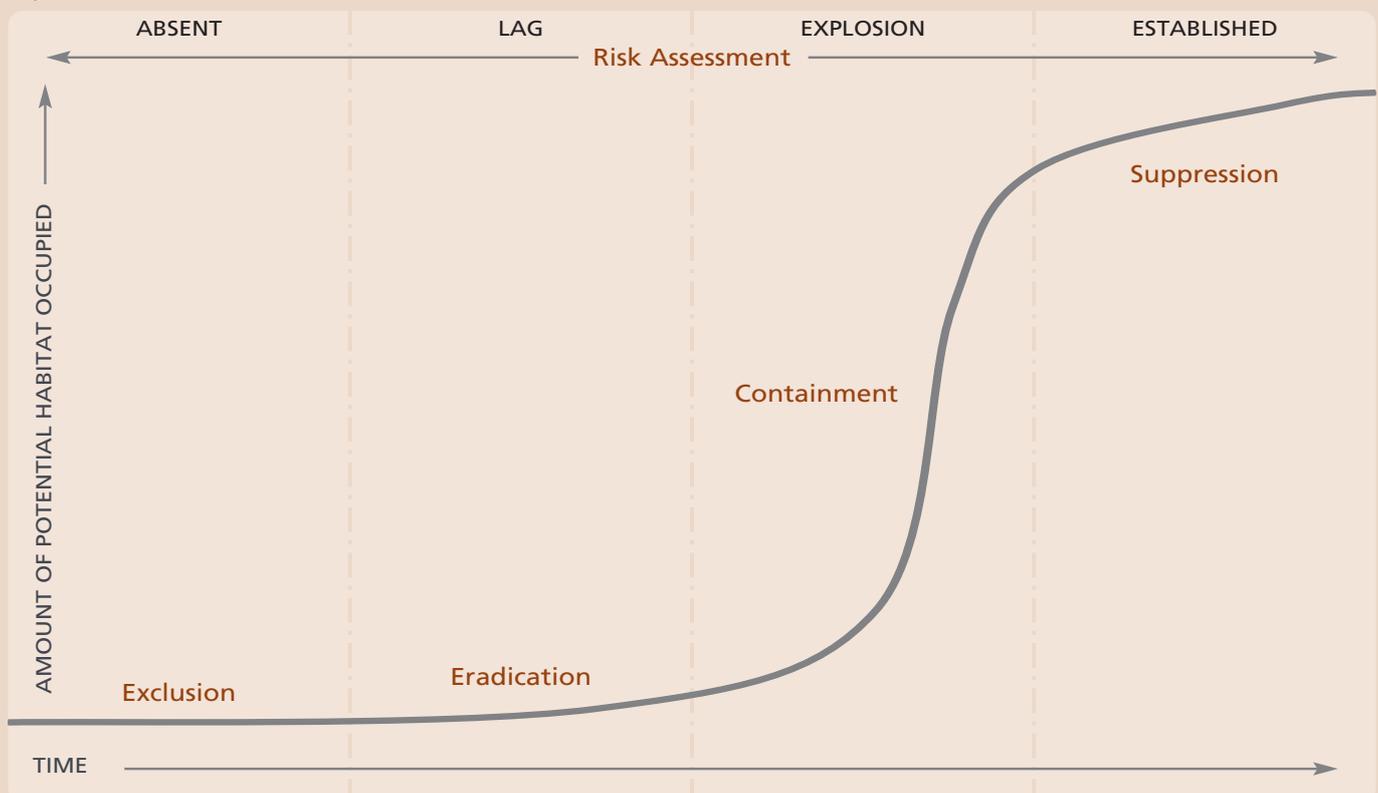
Exclusion pests are potential pests which are not known to have established in Northland or have previously established and all known sites have been eradicated. These pests all have the potential to establish in the region, and are capable of causing adverse effects. The intention is to prevent the pests in this category from entering and establishing within Northland over the life of the Strategy.

The NRC will work cooperatively with other agencies to undertake surveillance, research and raise public awareness of exclusion pests to prevent their establishment in the region. If an "Exclusion Pest" is found in the region, the NRC will work cooperatively with other agencies to take all practical steps to achieve eradication.

Eradication

This classification is applied to pests that are present in low numbers or limited distribution within the Northland region, and have the potential to have serious negative impacts on the community or the environment. The intention is to remove all individuals of these pests from the region, and eliminate the possibility of any further reproduction or propagation within the region. Eradication is only likely to be possible if the infestation is found when the populations are very small and the distribution is limited.

Figure 2: Invasion curve model.



Control of Eradication pests will usually be carried out by the NRC and its contractors or, with agreement, by other agencies. However, if specified within the RPMS, control of particular eradication pests will be the responsibility of the land occupiers or users of space in the CMA. The NRC will undertake surveillance and research, provide advice and raise public awareness of eradication pests to assist with eradicating them from the region.

Containment

This classification is applied to pests that are established in the region but are not widespread. These pests are present in the region at numbers and distributions that mean eradication is not possible or cost effective. The intention is to prevent the spread of these species beyond a defined containment area.

The NRC will provide advice, information and raise public awareness of pathways and vectors to try to reduce the spread of Containment pests. The NRC will support programmes to reduce the distribution and density of containment pests within the Northland region. The NRC will also ensure land occupiers or users of space in the CMA comply with Strategy rules designed to prevent the spread of a containment pest. Where specified, the NRC will undertake the control of large infestation sites and “sources” of pests.

Suppression

Suppression pests are those pests that are widespread in suitable habitat throughout the region. The intention is to reduce pest densities so that impacts on the community and the environment are decreased.

The NRC will provide advice and information to land occupiers or users of space in the CMA to assist with management of Suppression pests. The NRC will also ensure land occupiers or users of space in the CMA are acting as good neighbours by complying with Strategy rules regarding pest density levels and/or boundary control distances. The NRC will support programmes to reduce the distribution and density of Suppression pests within the Northland region.

Risk assessment

This classification is applied to pests which are of potential concern to the region, but little is known about the distribution or the risks posed to Northland. The intention is to improve understanding about the pest and its distribution, so that the pest can be classified and managed appropriately when the Strategy is reviewed.

The NRC will undertake surveillance, research and raise public awareness of Risk assessment pests to assist with classifying these pests and managing them appropriately. The NRC will provide advice and information to the public, and will support initiatives to minimise any adverse impacts they have. If surveillance indicates that a Risk assessment pest poses a threat to the region, and eradication is achievable, control may be carried out by the NRC and their contractors or, with agreement, by other agencies.

3.3 Pest Management Methods

The classification of a pest on the invasion curve helps guide Strategy objectives and management programmes for individual pests. The main management methods are described as follows:

Surveillance: surveillance involves the development and implementation of regional surveillance plans with a particular focus on pathways, vectors and areas of significance. Information about pest distribution and impacts will be collected and analysed through surveys and reports from the public and other agencies. Surveillance also includes routine monitoring of pest management operations.

Surveillance for potential pests can be difficult and the NRC will work with the Ministry of Agriculture and Forestry Biosecurity New Zealand (MAFBNZ) and other agencies to develop appropriate surveillance programmes which complement national programmes.

Incursion Response: this involves responding to the invasion of a newly arrived pest in the region. Eradication will be attempted in conjunction with relevant Crown agencies and stakeholders where practicable.

NRC Response: pest control will be carried out by the NRC and their contractors or, with agreement, by other agencies. NRC response will only be used where it is the most cost effective management option and/or the pest requires specialist expertise in identification and control.

Education: the NRC will provide information about pests, impacts, and pest management through publicity campaigns, publications, events and advice. The NRC will also provide training to relevant staff and stakeholders in the identification and control of certain pests.

Research: the NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Occupier Control (voluntary and regulatory): the RPMS may encourage or require occupiers to control certain pests. Control classes are:

- Total control - occupiers are required to kill all individuals of certain pests wherever they occur on the property.
- Boundary control - occupiers are required to control certain pests within an appropriate distance of the property boundaries.
- Quarry control - owners or occupiers of quarries and metal stockpile areas are required to control certain pests within operational areas. Operational areas include overburden soil storage stockpiles, pits and faces, extraction areas, raw material stockpiles, processing areas, product stockpiles, haulways and other vehicle routes.
- Roadside control - road controlling authorities are required to progressively control certain pests from the region’s formed road reserves, following an approved programme.

Rules: the RPMS contains rules which are enforceable under the Biosecurity Act. These rules may require land occupiers or users of space in the CMA to control certain pests. Non compliance with Strategy rules may be determined by complaints or inspections. Failure to comply with a Notice of Direction issued in relation to a breach can result in control being undertaken at the expense of the occupier. Prosecution through the Courts can also be used if necessary.

Site-led: the site-led method can take two forms; Community Pest Control Areas and High Value Areas. The Strategies also aim to grow the gains which have been made through community-led pest control by linking existing schemes and increasing the area of protected private land in Northland.

- **Community Pest Control Areas (CPCA):** this involves the NRC assisting local communities, interest groups and/or stakeholders to address pests within a given area. Each proposal for establishing a CPCA is assessed in terms of the feasibility of control, level of ongoing public/stakeholder support and the economic, environmental or cultural benefit likely. Each CPCA proposal must be put to the NRC, along with staff recommendations. If the NRC approves the establishment of the scheme, the NRC carries out the initial knockdown of pests that threaten particular values identified by a community group for a defined control area. NRC may also supply subsidised resources for ongoing control operations. Once the pest population density has been reduced to a predetermined level (i.e. pests no longer pose a threat to the identified values and/or a level at which it is practical for the land occupier or the group to control), the land occupiers and/or any associated group, assumes responsibility for maintenance. Where applicable, Biosecurity Officers will require CPCA members to control the selected pests under the enforcement provisions of the Biosecurity Act.
- **High Value Areas:** this approach targets areas of high biodiversity, cultural, recreational or economic value with a view to managing the threat of pests on these values. This requires identification of high value areas in conjunction with occupiers, stakeholders and other Crown agencies. Surveillance, pest prevention management and incursion response plans will be developed in partnership with these parties. Where new pest incursions are detected, local eradication will be attempted where practicable. The role of the NRC will depend on the high value area, and the role of other agencies, stakeholders and the community. However, it is likely that the role of the NRC will be similar to that in a CPCA, and will be subject to approval by NRC decision.

Biological Control: biological control involves the introduction of a pest's natural predators and/or competitors. Biological control agents are often insects or pathogens and must pass stringent testing before they can be used in New Zealand. This is a long term type of pest management, and can be very cost effective.

Unwanted Organisms:

- An **'unwanted organism'** is defined in the Biosecurity Act 1993 as any organism a Chief Technical Officer² believes capable of causing unwanted harm to any natural and physical resource or human health. Unwanted organisms are subject to the rules in sections 52 and 53 of the Act, which prohibit the release, spread, sale or breeding of the pest organism. All unwanted organisms are notifiable and must be reported to MAFBNZ.

- A **'notifiable organism'** is any organism which has been declared as such by Order in Council. The Biosecurity Act requires that every person who:

 - Suspects an organism that is a notifiable organism is present in any place in New Zealand; and
 - Believes that it is not established in that place; and
 - Believes that a Chief Technical Officer is not aware of its presence, must report the organism's presence to a Chief Technical Officer.
- The **National Plant Pest Accord (NPPA)** is a cooperative agreement between Regional Councils and government departments with biosecurity responsibilities (e.g. MAFBNZ, DOC). Under the NPPA, all signatory Regional Councils undertake surveillance at plant nurseries and other commercial outlets, to prevent the propagation, sale and/or distribution of an agreed list of pest plants. The NPPA list is dynamic, and changes periodically. A full list of unwanted organisms and the plants listed in the NPPA is available on the MAFBNZ website.

Section 100 Biosecurity Act 1993: section 100 enables Regional Councils to respond to the arrival of an unwanted organism whether the pest is identified in the RPMS or not. However, section 100 only applies where:

- Approved by Council resolution;
- Applied to an unwanted organism;
- The organism can be eradicated or controlled effectively within three years;
- The cost is less than that prescribed by the Governor General by Order in Council;
- The control is unlikely to result in significant monetary loss to any person other than those who contributed to the presence or spread of the unwanted organism by failing to comply with the Biosecurity Act or any Pest Management Strategy.

Responses to pests which are not unwanted organisms must be addressed through other means such as site-led programmes.

3.4 Monitoring

As the management agency responsible for implementing the Strategies, the NRC is required to prepare operational plans for each Strategy (section 85, Biosecurity Act). As such, operational plans will be prepared for the plant, animal and marine Strategies. The plans will be reviewed annually, and amended as necessary, for the duration of the Strategies.

Annual reports on the implementation of the Strategies will also be prepared and the results recorded in the Annual or Long Term Community Plans as appropriate. Annual reporting will include monitoring the extent to which the objectives of the Strategies are being achieved. Monitoring will include assessing and reporting on progress made towards meeting the objectives of species-led (Figure 3) and site-led programmes (Figure 4).

2 A Chief Technical Officer means a person appointed a Chief Technical Officer by the Director General under section 101 of the Biosecurity Act.

Figure 3: Northland region species-led programmes.

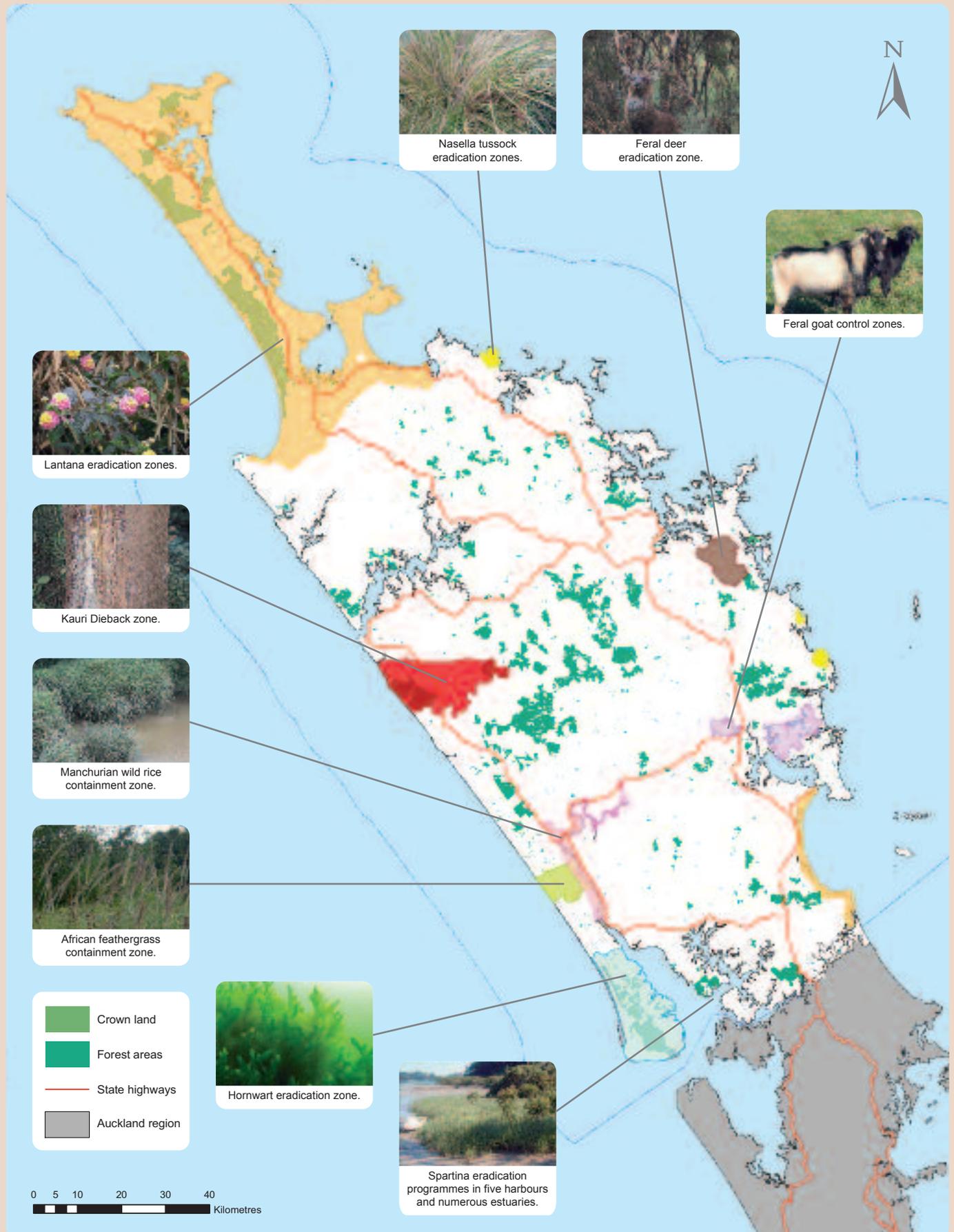
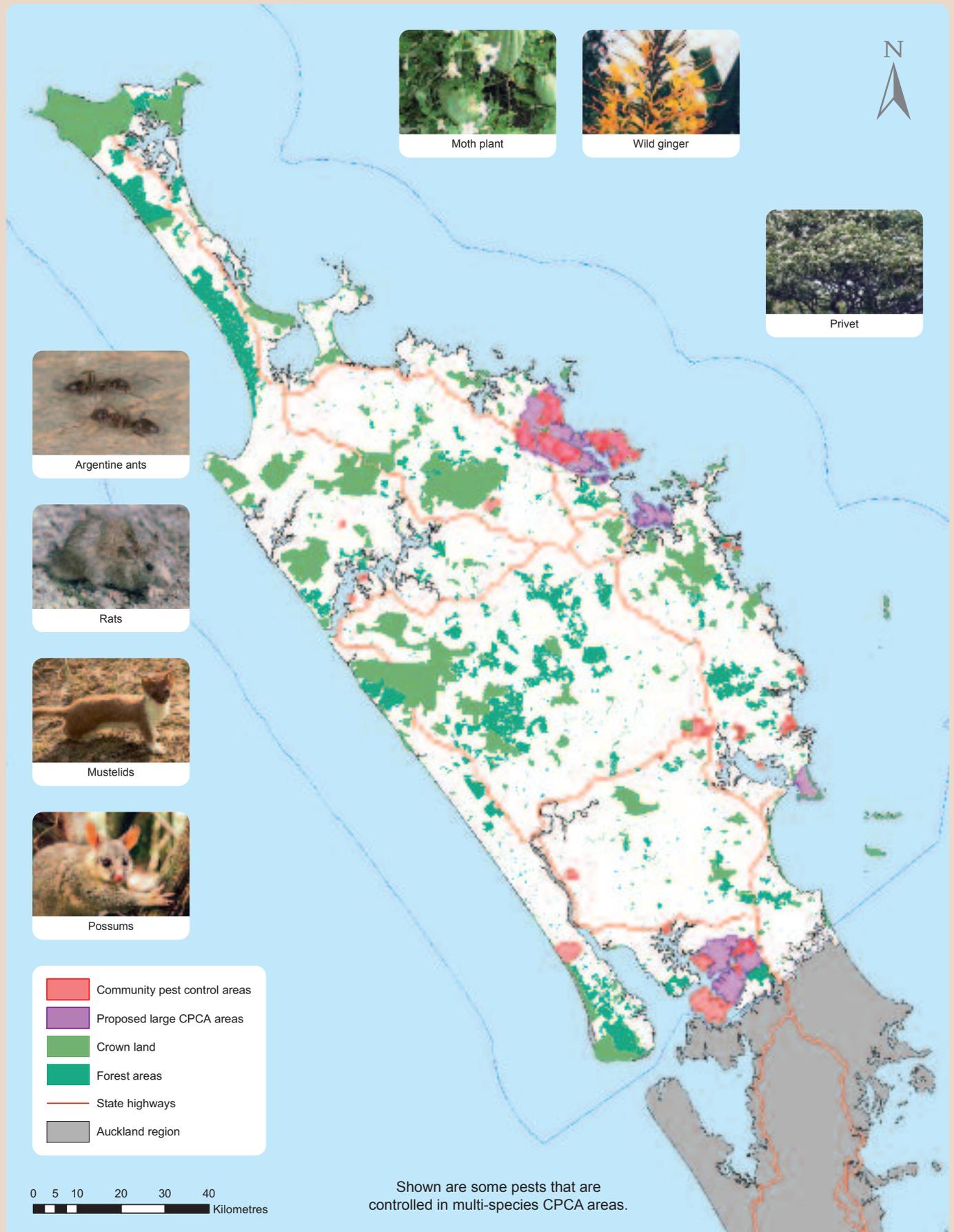


Figure 4: Northland region site-led programmes.



4. PLANT PEST MANAGEMENT STRATEGY

The plant pests included in the Strategy all cause, or have the potential to cause, adverse impacts on Northland's environmental, economic, cultural and recreational values.

Common Name	Scientific Name	Pest Classification	Page
African feather grass	<i>Pennisetum macrourum</i>	Containment	26
Akebia	<i>Akebia quinata</i>	Eradication	19
Alligator weed	<i>Alternanthera philoxeroides</i>	Suppression	36
Asiatic knotweed	<i>Fallopia japonica</i>	Exclusion	13
Bathurst bur	<i>Xanthium spinosum</i>	Containment	28
Californian thistle	<i>Cirsium arvense</i>	Containment	29
Cape tulip	<i>Moraea flaccida</i>	Exclusion	13
Cathedral bells	<i>Cobaea scandens</i>	Exclusion	13
Climbing spindle berry	<i>Celastrus orbiculatus</i>	Eradication	19
Eel grass	<i>Vallisneria australis, V. spiralis</i>	Eradication	19
Entire marshwort	<i>Nymphoides geminata</i>	Exclusion	14
Evergreen buckthorn	<i>Rhamnus alaternus</i>	Eradication	20
Fringed water lily	<i>Nymphoides peltata</i>	Exclusion	14
Giant hogweed	<i>Heracleum mantegazzianum</i>	Exclusion	14
Giant knotweed	<i>Fallopia sachalinensis</i>	Exclusion	13
Giant reed	<i>Arundo donax</i>	Containment	30
Gorse	<i>Ulex species</i>	Suppression	36
Gravel groundsel	<i>Senecio skirrhodon</i>	Suppression	37
Holly-leaved senecio	<i>Senecio glastifolius</i>	Exclusion	15
Houttuynia	<i>Houttuynia cordata</i>	Exclusion	15
Hydrilla	<i>Hydrilla verticillata</i>	Exclusion	15
Johnson grass	<i>Sorghum halepense</i>	Exclusion	16
Lantana	<i>Lantana camara, all varieties</i>	Containment	31
Manchurian wild rice	<i>Zizania latifolia</i>	Containment	33
Mexican feather grass	<i>Nassella tenuissima</i>	Eradication	20
Mickey mouse plant	<i>Ochna serrulata</i>	Eradication	20
Mile-a-minute	<i>Dipogon lignosus</i>	Eradication	21
Monkey musk	<i>Mimulus guttatus</i>	Eradication	21
Nardoo	<i>Marsilea mutica</i>	Eradication	21
Nassella tussock	<i>Nassella trichotoma</i>	Eradication	25
Nodding thistle	<i>Carduus nutans</i>	Containment	29
Old man's beard	<i>Clematis vitalba</i>	Eradication	22
Phragmites	<i>Phragmites australis</i>	Exclusion	16
Pampas	<i>Cortaderia jubata and C.selloana</i>	Suppression	37
Privet	<i>Ligustrum species</i>	Suppression	38
Purple loosestrife	<i>Lythrum salicaria</i>	Exclusion	16
Pyp grass	<i>Ehrharta villosa</i>	Exclusion	17
Ragwort	<i>Jacobaea vulgaris</i>	Suppression	39
Royal fern	<i>Osmunda regalis</i>	Eradication	22
Salvinia	<i>Salvinia molesta</i>	Eradication	22
Senegal tea	<i>Gymnocoronis spilanthoides</i>	Eradication	23
Skeleton weed	<i>Chondrilla juncea</i>	Exclusion	17
Spartina	<i>Spartina alterniflora, S. anglica, S. x townsendii</i>	Eradication	23
Water hyacinth	<i>Eichhornia crassipes</i>	Eradication	23
Water poppy	<i>Hydrocleys nymphoides</i>	Eradication	24
White bryony	<i>Bryonia cretica subsp. dioica</i>	Exclusion	17
Wild ginger	<i>Hedychium flavescens and H. gardnerianum</i>	Suppression	40
Yellow flag iris	<i>Iris pseudacorus</i>	Eradication	24
CPCA plants		CPCA	41
Risk assessment plants		Risk Assessment	43

4.1 Exclusion Plants

Exclusion plant pests are potential pests which are not known to have established in Northland or that have previously established and all known sites have been eradicated. These plant pests all have the potential to establish in the region, and are capable of causing adverse effects. Many of these plants are listed as unwanted organisms under the Biosecurity Act 1993. The intention of the Strategy is to prevent these plant pests from entering and establishing within Northland over the life of the Strategy.

Objectives, Methods and Rules for Exclusion Plants

The objectives, methods and rules for the exclusion plants apply to all plant species in this category.

Objectives (Five Year)

- To prevent the exclusion plant pests becoming established in Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of plant pests and encourage reports of sightings.
- To prohibit the sale/distribution of the exclusion plant pests.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other Crown agencies such as DOC, with a particular focus on pathways, vectors and areas of significance.
- Reported sightings will be investigated and response implemented.

Incursion Response:

- Eradication of infestations of the exclusion plant pests will be attempted by the NRC in conjunction with relevant Crown agencies and stakeholders, where practicable.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification of plant pests to assist in surveillance.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any exclusion plant pest within the Northland region.
2. No person shall knowingly possess, distribute, transport or release any exclusion plant pest (including any seeds or live vegetation) within the Northland region.
3. Every person who sees any exclusion plant pest, or suspects the presence of any exclusion plant pest, shall immediately report the sighting to the NRC or MAFBNZ.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

ASIATIC KNOTWEED GIANT KNOTWEED

(Fallopia japonica, F. sachalinensis)

Asiatic knotweed is an upright, shrublike herbaceous perennial that can rapidly grow to 3m in height. It has red-purple shoots which appear early in spring but, as the canes grow, the leaves unfurl and the plant turns green. The mature canes are hollow and have a characteristic pattern of purple speckles. The leaves are long, triangular-oval (15 x 10cm) and pointed at the tip, with a flattened leaf base. In late summer it produces masses of creamy white flowers.

Giant knotweed is similar to Asiatic knotweed but is taller. Both species grow in shrubland and riparian areas. Once established, both species can form dense stands that shade and crowd out all other vegetation, displacing native flora and fauna.



Bradley Kriebelhaus, USDA Forest Service, Bugwood.org

Asiatic knotweed

CAPE TULIP

(Moraea flaccida)

Cape tulip is a perennial herb in the iris family. It produces shoots annually in winter, and dies back to an underground corm in early summer. Plants grow to 90cm tall, with a single strap-like leaf and a branched flower stalk. Flowers are six-petalled, usually salmon pink with a band of deeper colour near the base of the petals, with or without a yellow centre. Flowers are usually 5cm across. The seeds are produced in narrow, green capsules, up to 5cm long.

All parts of Cape tulip are poisonous (even when dead and dried). Symptoms of poisoning include gastroenteritis, thirst, paralysis, blindness and heart and kidney failure. Cape tulip has the potential to establish dense colonies over wide areas of pasture, and could have a serious economic impact on agriculture if it became widely established.



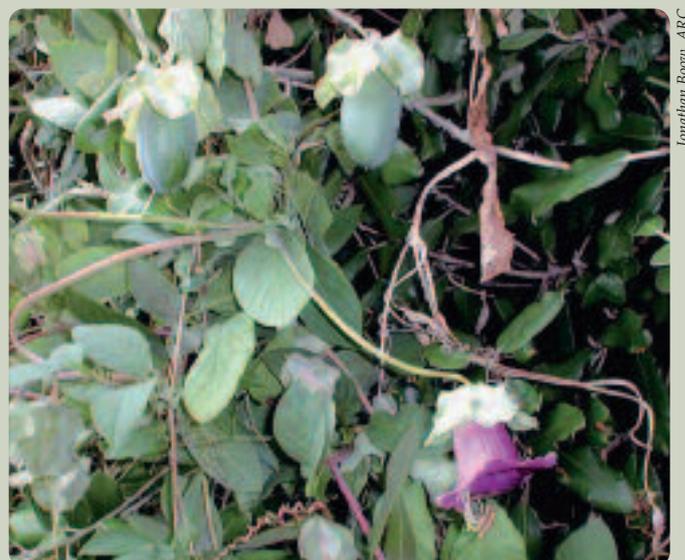
Andrew Massyn

CATHEDRAL BELLS

(Cobaea scandens)

Also known as: cup and saucer vine

Cathedral bells is a fast-growing perennial vine. It has bell-shaped flowers that are green when young but turn purple once pollen is shed. Capsules are hard, oval and usually 5.5-8.5cm long. They split into sections to release numerous flat, winged seeds. Cathedral bells grows in forest margins, roadsides, riverbanks, gardens and open areas, and grows in a wide range of soils and climates. The vines can grow over trees and shrubs, forming a dense canopy and smothering desirable plants.



Jonathan Boov, ARC

ENTIRE MARSHWORT

(Nymphoides geminata)

Also known as: marshwort, floating heart

Entire marshwort is a bottom-rooted, perennial, water lily-like plant. It has branched running stems, several metres long. The stems lie just beneath the water surface, producing groups of leaves, roots and flowers. The leaves are 30-80mm long, broadly ovate and smaller than the leaves of other water lilies. Entire marshwort has bright-yellow flowers with five petals and hair-like margins, which sit above the water surface on long stalks that grow in pairs. Flowers are produced from November through to April. Entire marshwort rapidly colonises shallow water, forming dense mats which block waterways and smother other aquatic plants.



Trevor James, AgResearch

FRINGED WATER LILY

(Nymphoides peltata)

Also known as: entire marshwort, yellow floating heart

Fringed water lily is very similar to marshwort, but its leaves are frequently purple underneath and have scalloped margins. The flowers are golden-yellow, 3-4cm across with five petals, and are held above the water surface on long stalks. The flower edges are distinctively fringed and solid. It also produces fruit, which is a capsule up to 2.5cm long containing numerous seeds. These seeds are flat, oval and about 3.5mm long, with hairy edges. Fringed water lily has the potential to colonise waterways, forming dense mats, impeding drainage and restricting water activities.



Trevor James, AgResearch

GIANT HOGWEED

(Heracleum mantegazzianum)

Also known as: wild rhubarb, cartwheel flower, wild parsnip, cow parsnip

Giant hogweed is a perennial that grows 4-6m in height. It has stout dark-reddish-purple stems, and spotted leaf stalks with sturdy bristles which contain a toxic sap. The stems and stalks are hollow and the stems are 5-10cm in diameter. Giant hogweed has extremely large leaves (up to 1.5m) and tuberous root stalks. When the plant is two to three years old it produces large umbrella-like clusters of greenish-white flowers. It usually grows on the banks of rivers or creeks.

Giant hogweed is poisonous to humans. Touching it, or exposure to dust from weed-eating, can irritate skin and cause blisters and swelling. The toxin actually causes photosensitisation so that the skin reacts badly to sunlight. It also outcompetes and replaces native plants.



Terry English, USDA APHIS PPO, Bugwood.org

HOLLY-LEAVED SENECIO

(Senecio glastifolius)

Also known as: pink ragwort

Holly-leaved senecio is an erect perennial herb which grows up to 1m high. It has oval leaves, which are coarsely toothed and holly-like. The flowers are purple, mauve or pink and occur in clusters. Young plants develop into a small rosette then into a 'cabbage' type growth form. Holly-leaved senecio occurs mainly on partially stabilised sand dunes and other coastal sites. It reproduces by seed from flowers produced over a short period in October. A few plants have a second, smaller burst of flowering in January/February which set seed in March. It is an aggressive invader that can become dominant cover, reducing land productivity. It is a threat to dune and coastal sites.



DOC

HOUTTUYNIA

(Houttuynia cordata)

Also known as: chameleon plant, ground ivy

Houttuynia is a perennial groundcover that spreads rapidly via stolons. The leaves are heart-shaped and are usually variegated cream, bronze, scarlet and green, but may be plain green. They have an unpleasant, peppery scent when crushed. Houttuynia has small white flowers which are densely clustered on short spikes. Houttuynia grows rapidly, forms dense colonies and replaces native vegetation. It can reproduce from tiny fragments and can seed in the absence of male plants. It can grow in both soil and water. Houttuynia has been found in Northland, but is thought to have been eradicated.



Antoniz van den Bos, for ajcromto.com

HYDRILLA

(Hydrilla verticillata)

Hydrilla is a submerged perennial aquatic oxygen weed that can grow up to 9m tall in still or slow-flowing fresh water. The bottom-rooted plant forms underground tubers. Its thin many-branched stems are produced in whorls of three to eight with obvious toothed edges. Leaves are generally green, but often have small reddish-brown spots and stripes. It forms very dense stands, crowding out native aquatic plant species, restricting light and depleting oxygen.

Hydrilla is one of the world's worst submerged waterweeds. It out-competes other aquatic plants and can remain dormant in sediments for up to ten years waiting for the right conditions to grow. Hydrilla forms dense mats which are a nuisance to lake users such as bathers, anglers and boat users. Plant material washed ashore rots, reducing the aesthetic value of lakes, and restricting access to water. It may also clog



Robert Vidéki, Doronicum Kft., Bugwood.org

hydroelectric dams and block water intakes. Hydrilla is spread easily through stem fragments.

Hydrilla is not known to be in Northland. It is currently found in four lakes in the Hawke's Bay region, and MAFBNZ has an eradication programme underway.

JOHNSON GRASS

(Sorghum halepense)

Johnson grass is a robust, aggressive, perennial, summer grass capable of forming dense thickets that exclude most other plants. Seedlings are very similar to young maize plants both in habit and growth pattern. Mature plants vary in height from 50-300cm. Leaf blades are flat, alternate, up to 900mm long and 2-5cm wide. The midrib on the underside is whitish. Leaf sheaths are ribbed and often hairy on the inside of the junction with the blade.

Johnson grass is considered to be one of the world's worst weeds and one of the five worst weeds in New Zealand. It could have a major economic impact on New Zealand agriculture should it become widely established. Johnson grass forms dense spreading patches that compete vigorously with other plants often out-competing grasses and crops. Pieces of rhizome and seed may contaminate cultivation and harvesting equipment and be transported to new sites.



Barry Rice, sarracenia.com, Bugwood.org

PHRAGMITES

(Phragmites australis)

Also known as: common reed

Phragmites is a perennial grass that grows up to 3m tall on water margins. It has bamboo-like stems which carry long, wide, flat leaves that taper to a point. It has large, fluffy, purplish-brown flower heads, and seed grain which is covered in silky hairs. It is similar to giant reed (*Arundo donax*), but Phragmites is smaller and the stems are narrower in proportion to the leaves. Phragmites reproduces asexually by rhizomes.

In its native range, Phragmites forms dense patches on the edges of waterways. It is expected to invade waterways in New Zealand if it becomes more widespread however this is unlikely unless it is distributed by people who spread rhizome fragments.



NIWA

PURPLE LOOSESTRIFE

(Lythrum salicaria)

Also known as: bouquet-violet

Purple loosestrife is an erect, summer-green perennial herb which grows 1-2m tall. It has narrow leaves which are usually paired and heart-shaped at the base. From December to February a showy dense flower spike (20-25cm long) is produced, made up of purple-magenta flowers with five to six petals which are followed by blackish seed capsules (3-5mm long). Purple loosestrife is a highly aggressive invader of damp ground, wetlands and shallow water. It overtops native species with dense bushy growth, is long-lived and produces millions of long-lived, highly viable seeds from an early age. It tolerates hot or cold conditions and a wide range of nutrient levels in the water, but is intolerant of salt water.



NIWA

PYP GRASS

(Ehrharta villosa)

Pyp grass is a perennial grass which grows from long, creeping rhizomes. The jointed stems are robust and are usually 90-200cm tall. Leaves are bluish-green and short in proportion to the stems, about 1.5-13cm long. The leaves may be absent. The flower head is a panicle up to 25cm long, narrow and rather lax.

Pyp grass has a limited distribution in New Zealand, being known from three sites where it has invaded sand dunes. Pyp grass is a serious agricultural weed in South Australia. It commonly grows as a dense sward displacing most other species, in some cases even scrambling over shrubs up to 2-3m in height. Pyp grass is a significant threat to sand dune systems throughout New Zealand. It is expected to invade dunes and contribute to the degradation of sand dune habitats.



Dr Kerry C Harrington, Massey University

SKELETON WEED

(Chondrilla juncea)

Skeleton weed is a perennial herb with erect, branched stems up to 90cm tall. It has small yellow flower heads (December – March) and the flowering stems are almost leafless. Seeds have a group of white, downy hairs at one end and a 'tooth' with hooks that help dispersal. Skeleton weed is a wiry weed which obstructs crops, and causes loss of production and blockage of machinery. It poses a significant threat to kumara, maize and other crop growers and market gardeners. It also competes strongly with pasture species for moisture and nutrients, especially in spring.



Gary L. Piper, Washington State University, Bugwood.org

WHITE BRYONY

(Bryonia cretica subsp. dioica)

White bryony is a soft green cucumber-like vine that climbs up to 6m by means of its curled tendrils. It produces clusters of small cream white flowers in spring/summer, with male and female flowers on separate plants. On female plants these are followed by 8mm berries, in bunches of three to eight that ripen to light red from January to April. The shoots die back in autumn to a persistent perennial tuber.

White bryony smothers and shades out whatever it grows on. It is dispersed by birds and its tubers are hard to find. The fruit and tubers contain toxic alkaloids, which may be poisonous if consumed in quantity. White bryony is of very limited distribution in the wild in New Zealand



V. Reid, ARC

4.2 Eradication Plants

Eradication plant pests are pests that are present in low numbers or a limited distribution within the Northland region, and have the potential to have serious negative impacts on the community or the environment. The intention is to remove all individuals of these pests from the region, and eliminate the possibility of any further reproduction or propagation within the region. Eradication is only likely to be possible if the infestation is found when the populations are very small and the distribution is limited.

Objectives, Methods and Rules for Eradication Plants

The objectives, methods and rules for the eradication plant pests apply to all species in this category, except nassella tussock (*Nassella trichotoma*).

Objectives (Five Year)

- To remove all individuals of the eradication plant pests from Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of plant pests, and encourage reports of sightings.
- To prohibit the sale/distribution of the eradication plant pests.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other Crown agencies such as DOC, with a particular focus on pathways, vectors and areas of significance.
- Reported sightings will be investigated and response implemented.

NRC Response:

- Eradication of infestations of the eradication plant pests will be attempted by the NRC and their contractors or, with agreement, by other agencies if practicable.

Incursion Response (for salvinia and water hyacinth only):

- MAFBNZ is the lead agency for salvinia and water hyacinth and the NRC will provide support as needed during eradication of infestations.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification of plant pests to assist in surveillance.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any eradication plant pest within the Northland region.
2. No person shall knowingly possess, distribute, transport or release any eradication plant pest (including any seeds or live vegetation) within the Northland region.
3. Every person who sees any eradication plant pest, or suspects the presence of any eradication plant pest, shall immediately report the sighting to the NRC.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

AKEBIA

(Akebia quinata)

Also known as: chocolate vine, five-leaved akebia, *Rajania quinata*

Akebia currently has a limited distribution in Northland. It is a twining vine or ground cover, with leaves of five oval-shaped leaflets (3cm) which meet at a central juncture. It has chocolate-purple coloured flowers, which have an odour that is similar to chocolate or vanilla, and appear from August to October in New Zealand.

Akebia can form dense patches which out-compete and kill ground cover and shrubs/young trees. Birds can spread the seeds, but mostly this plant is spread by human activity.



Liz Sherwood, DOC

CLIMBING SPINDLE BERRY

(Celastrus orbiculatus)

Also known as: Oriental bittersweet

Climbing spindle berry currently has a limited distribution in Northland. It is a perennial climbing woody vine with greyish-brown branches growing up to 12m high. The young branches are green, often with sharp 1-2mm spines. The serrated leaves are 5-10cm long, tapered, alternately spaced, and turn yellow in autumn. It has bright orange fruit with a scarlet centre.

Climbing spindle berry is a vigorous vine that prefers sunny spots but is also shade-tolerant. Once established, it can "wait" for a disturbance in forest canopy and then compete with native species for resources.



David Smith, www.delatanareculiflowers.org

EEL GRASS

(Vallisneria australis and V. spiralis)

Also known as: *Vallisneria gigantea*

Eel grass "Lake Pupuke variety" (*V. australis*) is a submerged perennial freshwater plant which can grow up to 5.5m tall. It is bottom-rooting, and produces long, ribbon-like, light-green leaves from nodes at regular intervals. Only male plants are known in New Zealand, with large pollen sacs produced at the base of mature plants.

Eel grass "Meola creek variety" (*V. spiralis*) is also a submerged perennial freshwater plant, and occurs at one site in Northland. The leaves are generally narrower than *V. australis*. Only male plants are known in New Zealand, which produce inconspicuous flowers on the end of a long spiral stem.

Eel grass forms dense beds of vegetation which out-compete and displace native plants. The dense beds can block dams



Paul Champion, NIWA

and waterways, impede drainage, obstruct water out-takes and affect recreational activities. No seeds are produced, and eel grass is generally spread through intentional planting.

EVERGREEN BUCKTHORN

(Rhamnus alaternus)

Also known as: rhamnus, Italian buckthorn

Evergreen buckthorn is known to be present at one site in Northland, at Matakoho. It is an evergreen shrub that grows to 2-3m tall, and has ovalish leathery leaves (15-60 x 10-30mm) which are glossy and slightly toothed. It has small green petal-less fragrant flowers (3-4mm in diameter) which are produced from May to November. Flowers are followed by showy, glossy berries (5-7mm long) which ripen from dark-red to black from December to January. Evergreen buckthorn is commonly mistaken for a native plant.

Evergreen buckthorn forms dense stands and prevents the establishment of native plant seedlings. It establishes readily in coastal areas and barren sites, and on the edges of streams and forests. It can completely dominate coastal cliff habitats, altering the form and structure of the ecosystem.



Holly Cox, ARC

MEXICAN FEATHER GRASS

(Nassella tenuissima)

Also known as: fine-stemmed needle grass, Stipa tenuissima

Mexican feather grass has been eradicated from all known sites in Northland, but there is a possibility of undiscovered outliers. It is a perennial, drought-resistant tussock grass with fine wiry leaves <70cm high. It flowers between October and December, and the feathery flower-head is erect when young and weeping over when mature. Each plant has huge numbers of rough-coated seed (<120,000) with tufted hair at the base.

Mexican feather grass is very closely related to nassella tussock. It has the same invasive characteristics and is unpalatable to stock. If stock eat it, they get indigestible balls in their stomachs, leading to weight loss and starvation. Mexican feather grass crowds out pasture species and



reduces productivity. It also replaces native species in open and coastal areas.

MICKEY MOUSE PLANT

(Ochna serrulata)

Also known as: ochna, bird's eye bush, small-leaved plane

Mickey Mouse plant is present in Northland but currently has a limited distribution. It is a small shrub of 1-2m in height. It produces spherical, black, berry-like fruits attached to red sepals, which resemble the face of Mickey Mouse. Mickey Mouse plant has elliptical leaves which are 13-50mm long with toothed leaf margins, and fragrant yellow blossoms about 20mm in diameter which precede the black fruit. The young spring foliage starts as pinkish-bronze and matures to glossy green.

Mickey Mouse plant is easily dispersed, and could spread and naturalise in the wild. It has recently naturalised in New Zealand and is regarded as a weed in Australia. It can form a dense monoculture that prevents regeneration of native species.



Gina Williams, DOC

MILE-A-MINUTE

(Dipogon lignosus)

Also known as: *Dolichos capensis*, *D. gibbosus*, *D. lignosus*, *Verdcourtia lignosa*

Mile-a-minute currently has a limited distribution in Northland. It is an evergreen climbing vine. Stems are rounded and moderately hairy. The leaves are green above and pale below, and made up of three heart-shaped leaflets (25-55mm long). It has pea-like white, lavender and white, or pink to reddish-purple flowers (10-15mm long) from July to January. Flowers are followed by sickle-shaped seed pods (30-40mm long).

Mile-a-minute is a fast-growing vine, it smothers and kills most plants from ground level to medium canopy and prevents the establishment of native plant seedlings. It thrives in bare sites and increases nitrogen in impoverished soil types, potentially changing the species that can grow there.



Tony Rodd

MONKEY MUSK

(Mimulus guttatus)

Monkey musk is present in Northland but currently has a limited distribution. It is an erect perennial bog herb that grows up to 60cm tall. It has thick, stiff stems that are occasionally branched. The oval leaves are opposite, up to 12cm long, usually hairless, bright green and tooth-edged. Monkey musk has yellow flowers with red spots on the bearded lower lip. Seed capsules are 1cm long, with many patterned seeds. This is a highly variable plant, taking many forms. Both annual and perennial forms occur throughout the species' range. It is sometimes aquatic, its herbage floating in small bodies of water.

Monkey musk can significantly alter the structure of riparian plant communities. It has the potential to choke channels and impede drainage.



Liz Sherwood, DOC

NARDOO

(Marsilea mutica)

Also known as: *water clover*

Nardoo has been eradicated from all known sites in Northland, but there is a possibility of undiscovered outliers. Nardoo looks like a member of the clover family, but is actually a freshwater fern. It has flat, floating leaves and resembles a large four-leaf clover. The leaves float on the surface of the water on stalks up to 1m long. The roots form dense, floating masses. It doesn't flower, spore or set seeds in New Zealand, but grows from stem and root fragments. Nardoo grows in freshwater less than 1m deep, mainly in swamps, dams and garden ponds.

Nardoo can form dense beds of vegetation which can block dams and waterways, impede drainage and disrupt recreational activities. It out-competes native species, and is also highly toxic to stock.



OLD MAN'S BEARD

(Clematis vitalba)

Old man's beard has been eradicated from all known sites in Northland. It is a deciduous climbing vine that grows to 20m tall. It has very long, woody stems with six prominent ribs, and pale, easily rubbed-off bark. Leaves are arranged in opposite pairs on the stems, and are made up of five leaflets. The thin leaflets are sparsely hairy and have bluntly toothed or smooth edges. Fragrant, creamy-white flowers are produced from December to May. Flowers are followed by grey, hairy seeds with white plumes in dense, fluffy clusters. Old man's beard smothers and kills all plants to the highest canopy, and prevents the establishment of native plant seedlings. It moves into established forest over the canopy by layering. Seeds are spread by wind, water and soil movement.



Jolie Hazley, DOC

ROYAL FERN

(Osmunda regalis)

Royal fern is present in Northland but currently has a distribution limited mainly to sites on the Poutō Peninsula. Royal fern is a deciduous fern whose rhizomes form a short woody trunk up to 1.5m high. It has large fronds up to 3m long and 75cm wide. The fronds are feather-like, subdivided twice, yellow-green and tough. Its spores are produced in brown, fertile fronds resembling tiny bunches of grapes. Plants die back to the woody trunk in winter.

Royal fern can naturalise and form dense colonies in a range of wetland habitats, especially in disturbed areas and under the shade of willows or manuka. The plants displace other small native wetland plants.



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SALVINIA

(Salvinia molesta)

Also known as: kariba weed

Salvinia appears to have been eradicated from all known sites in Northland, but there is a possibility of undiscovered outliers. Salvinia is a small, free-floating aquatic fern which forms large, dense mats. It has branched, horizontal stems that lie just below the water surface. Plants are usually up to 30cm long, and have green to bronze spongy leaves that occur in pairs. Leaf shape varies with the age and environment of the plant. The upper surface of the leaf is water repellent and covered with distinct white hairs with an egg beater-like tip. Salvinia has no true roots but has a root-like structure underneath each leaf pair.

Salvinia quickly forms extensive mats, completely smothering waterways and badly affecting water quality. It can double in area within 10 days. The mats kill off native plants, block



Deborah Iscorno

dams and waterways, impede drainage and disrupt recreational activities. The mats also create a drowning risk for people and animals.

SENEGAL TEA

(Gymnocoronis spilanthoides)

Also known as: temple plant, costata

Senegal tea is known in only a few sites in Northland, but there is a possibility of undiscovered outliers. It is a hardy, semi-aquatic, perennial herb which grows up to 1.5m high and forms floating mats in and above the water. It has dark green, opposing leaves that are shiny and hairless. It flowers November to April and produces distinctive, white, clover-like flowers. It looks like alligator weed or willow weed, except that the margins of its leaves are bluntly serrated. Senegal tea lives in marshy soils, still or flowing water including wetlands and streams. It prefers a warm, fertile climate and tolerates frost.

Senegal tea grows very quickly, and is known to rapidly cover water bodies with a floating mat, displacing and out-competing native plants. The effects of flooding are made



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much worse because infestations block drainage channels. Recreational activities and irrigation may also be affected.

SPARTINA

(Spartina alterniflora, S. anglica, S. x townsendii)

Also known as: cord grass, salt grass

There are two types of spartina found in Northland – *S. alterniflora* and *S. anglica*. *S. x townsendii* is a rare hybrid plant, rarely found north of the Kaipara Harbour. Spartina is present in many Northland harbours and estuaries. The control programme is progressing, with most sites at either zero density or less than five percent of original density.

Spartina is an erect saltwater grass growing up to 1.5m high, and is the only plant that can grow in intertidal areas of estuaries, along with mangroves. It has wide, ribbed, alternating leaves, and flowers in a head of short, flattened spikelets. *S. alterniflora* is the most common in Northland, and is the more robust of the two, with stems over 8mm in diameter and forming open clumps. *S. anglica* is smaller, with stems of up to 5mm in diameter. It forms denser clumps and tends to form a dense mat.



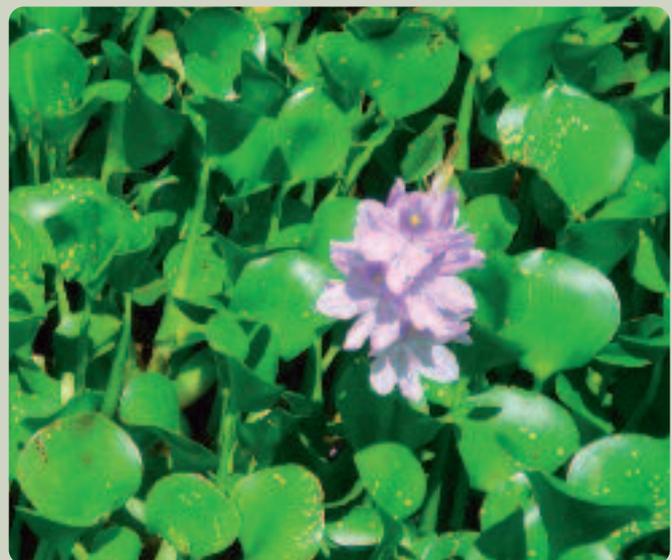
Spartina forms dense mats, taking over coastal marine areas and leading to a loss of habitat for birds, recreational fisheries and seafood. The mats trap sediments and can severely modify the marine mud flat ecosystem, and restrict access to estuarine areas. Extensive areas of the plant can cause surface flooding on adjacent land.

WATER HYACINTH

(Eichhornia crassipes)

Water hyacinth appears to have been eradicated from all known sites in Northland, but there is a possibility of undiscovered outliers. Water hyacinth is a free-floating aquatic perennial. It has a rosette of shiny, rounded leaves with long, feathery roots. The leaves are glossy and green with swollen bases and thick runners. The flowers are mauve-blue, with a yellow spot in the centre. It has been released from garden and ornamental ponds and lives in still or slow-moving freshwater such as ponds, streams, swamps and dams.

Water hyacinth forms dense mats, completely smothering waterways and badly affecting water quality. The mats kill native plants, block dams and waterways, impede drainage and disrupt recreational activities. The mats also create a drowning risk for people and animals.



Katherine Parry, Louisiana State University, Bugwood.org

WATER POPPY

(Hydrocleys nymphoides)

Water poppy appears to have been eradicated from all known sites in Northland, but there is a possibility of undiscovered outliers. Water poppy is a water lily-like perennial plant. The leaves are thick and shiny and float on the surface, with each shoot connected by a network of elastic creeping stems that form a dense mat. It has a distinctive three-petalled solitary pale-yellow flower with a dark purple centre. Flowers are up to 8cm across. Water poppy lives in still or slow-flowing water less than 2m deep, especially if the water is nutrient-rich. It is often found in ponds, dams and swampland.

Water poppy quickly forms mats blocking waterways and drains, causing flooding. It is a particular threat to native species that cannot compete with its aggressive growth.



Holly Cox, ARC

YELLOW FLAG IRIS

(Iris pseudacorus)

Yellow flag iris is present in Northland but currently has a limited distribution. Yellow flag iris is an aquatic perennial growing in leafy clumps up to 2m tall, and arising from dense rhizomes (up to 3cm in diameter). Sword-like leaves emerge in fans from a reddish base. From October to December it produces pale-yellow to golden-orange flowers (up to 12cm in diameter), followed by seed capsules containing many brown, flattened, three-sided, disc-like seeds.

Yellow flag iris is poisonous to humans and animals. Rhizomes form dense floating mats, and the plant over-tops native species that grow on margins of water bodies, including estuarine areas. It can also invade flood-prone pasture.



Paul Champion, NIWA

NASSELLA TUSSOCK

(Nassella trichotoma)

Also known as: *serrated tussock, Stipa trichotoma*

Nassella is found in dry farmland along the east coast of Northland, and numbers of plants are very low due to the ongoing eradication programme. The main infestations are at Taupo Bay, Whananaki, Matapōuri, Urquharts Bay, Topuni, Tahere and Mangapai. Nassella tussock is a perennial grass with fine-bladed wiry leaves. It grows up to 1m high and 1m across. It will grow almost anywhere but is commonly found in dry sunny areas.

Small plants are very similar in appearance to some native grasses which makes identification difficult. Nassella invades pasture areas, reducing productivity. Each mature plant can produce up to 100,000 seeds per year. It is unpalatable to stock, and the prolific seeding and relatively long seed life make it difficult to eradicate. Nassella also invades sensitive indigenous habitats reducing their ecological value.

Objectives (Five Year)

- To eradicate nassella from Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of nassella and encourage reports of sightings.
- To prohibit the sale/distribution of nassella.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other Crown agencies such as DOC, with a particular focus on pathways, vectors and areas of significance.
- Reported sightings will be investigated and response implemented.

NRC Response:

- Eradication of infestations of nassella will be attempted by the NRC and their contractors or, with agreement, by other agencies if practicable.
- The owners of infested properties will be charged a proportion of the actual and reasonable costs of the inspection and control service provided (as provided for in section 135 of the BSA).
- The NRC will maintain a database recording all infestations, and areas affected. All sites will be inspected at least once between October and December each year, and the information updated.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification of plant pests to assist in surveillance.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.



Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any nassella within the Northland region.
2. No person shall knowingly possess, distribute, transport or release any nassella (including any seeds or live vegetation) within the Northland region.
3. Every person who sees any nassella, or suspects the presence of any nassella, shall immediately report the sighting to the NRC.
4. The NRC may recover costs by direct charge to the occupier concerned, as provided for in section 135 of the Biosecurity Act 1993. The proportion of the cost recovered will be determined by the degree of difficulty in finding nassella seedlings, as affected by the vegetative cover on the land and in accordance with the NRC charging policy.

Nassella-infested areas are assigned to cost recovery categories as follows:

- **Category I** – surveillance sites, that is sites found free of nassella for the preceding three or more years. *No cost recovery.*
- **Category II** – sites where nassella is still being found but which have been permanently retired from grazing and on which there is a full canopy cover of indigenous scrub or forest, or such a cover is being actively encouraged. *No cost recovery.* A plan to retire the land must be in accordance with a management plan and a Memorandum of Understanding agreed to by the land occupier and the Biosecurity Senior Programme Manager of the NRC. Any such agreement must be entered into before the annual programme.
- **Category III** – sites where nassella is still being found but which are being managed to encourage a dense, well grazed pasture with easy access and no obstructions which prevent plants being seen. *20% cost recovery.*
- **Category IV** – sites where nassella is still being found, which have obstructions to access and visibility. Typically non- or lightly-grazed pasture with less than 10% scrub or scrubby weeds. *40% cost recovery.*
- **Category V** – sites where nassella is still being found, which have major access problems and obstructions to visibility. Typically reverted pasture with greater than 10% cover of gorse or scrub, unpruned pine forest with long grass or scrub under storey or pine forest with heavy pruning and/or thinning slash. *60% cost recovery.*

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

4.3 Containment Plants

Containment plants are generally those pests that are established in the region but are not widespread. These plant pests are present in the region at numbers and distributions that mean eradication is not possible or cost effective. The intention is to prevent the spread of these species beyond a defined containment area.

AFRICAN FEATHER GRASS

(Pennisetum macrourum)

Also known as: *veld grass*

African feather grass is a perennial grass that forms large clumps up to 2m tall. It spreads by advancing its stout rhizomes and by seed dispersal. It has a distinctive yellow to purple flower, with prominent bristles protruding from the body of the spike. When ripe, the spikelets containing the seed fall away, leaving the bare stem. The shape of the panicle readily distinguishes it from the larger pampas grass. African feather grass flowers from November to April.

African feather grass has a very restricted distribution in Northland. It is known to exist at a number of sites most of which are in the Kaipara District, particularly within the coastal dune area. It invades poor pasture areas, roadsides and reserves, and can completely suppress all other low growing plants. Dense clumps restrict the movement of animals, people and machinery, and impair drainage and visibility along roads.

Objectives (Five Year)

- To contain African feather grass to known infestation areas in western Northland and to progressively decrease the size of the containment zone over the course of the Strategy.
- To eradicate African feather grass found outside the containment zone.
- To implement management plans for those sites within the containment zone.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of African feather grass and encourage reports of sightings.
- To prohibit the sale/distribution of African feather grass.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other Crown agencies such as DOC, with a particular focus on pathways, vectors and areas of significance.
- Reported sightings will be investigated and response implemented.

NRC Response:

- Eradication of infestations of African feather grass outside the containment area will be attempted by the NRC and their contractors or, with agreement, by other agencies if practicable.

Occupier Control:

- Management plans will determine the level of occupier control in areas where long term control is required.



Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification and control of plant pests.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Rules

1. No person shall knowingly distribute, transport or release any African feather grass (including any seeds or live vegetation) within the Northland region.
2. Where African feather grass is present on a property within the containment area, the occupier shall implement a management plan to contain African feather grass and ensure that it does not spread to non-infested areas of the property.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

See African feather grass containment zone (Figure 5) opposite.

Figure 5: African feather grass containment zone.



BATHURST BUR

(Xanthium spinosum)

Also known as: *spiny cocklebur*

Bathurst bur is an annual plant that grows up to 1m tall. It has well-branched upright stems with triple spines grouped in opposite pairs. The leaves are three-pronged, narrow and pointed. They have a white midrib above and are whitish on the underside. Bathurst bur has inconspicuous flowers and the fruits are bur-like with hooked spines, and spread mainly by attachment to animals, equipment, water, and in produce. The germination period is from November to February.

Bathurst bur has a limited distribution in Northland. Most infestations occur in the cropping areas of the Kaipara District, and in isolated patches throughout Northland. Bathurst bur is usually found on disturbed, bared ground of high fertility, and in cultivated areas. Dense stands of the plant can impede harvesting of field crops and the movement of stock. Young plants may be toxic to stock. Burs can also cause skin irritations and dermatitis in some people. Bathurst bur has a very long lived seed bank, making eradication difficult.

Objectives (Five Year)

- To contain Bathurst bur to existing sites.
- To ensure that all Bathurst bur plants are destroyed each year before they set seed.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of Bathurst bur and encourage reports of sightings.
- To prohibit the sale/distribution of Bathurst bur.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other Crown agencies such as DOC, with a particular focus on pathways, vectors and areas of significance.
- Sightings reported from outside the containment area will be investigated and response implemented.

Total Control:

- Occupiers are required to kill all individuals of Bathurst bur prior to seeding wherever they occur on the property.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification and control of plant pests.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.



Rules

1. No person shall knowingly distribute, transport or release any Bathurst bur (including any seeds or live vegetation) within the Northland region.
2. Land owners or occupiers must destroy all Bathurst bur on land they occupy.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

CALIFORNIAN THISTLE

(*Cirsium arvense*) and

NODDING THISTLE

(*Carduus nutans*)

Californian thistle is a perennial thistle, which spreads from rhizomes. The plant produces leafy stems 50-150cm tall and small purple flowers. Leaves are small on top, with numerous teeth. Californian thistle characteristically grows in patches often from a single plant. It establishes readily in light, loamy soils and competes with both crops and pasture. It is a major weed south of Auckland occupying large tracts of pasture land.

Nodding thistle is an annual or biennial herb, with an upright, spiny appearance. The plant has a prostrate rosette and erect flowering stems and grows up to 1.5m tall with a long, fleshy taproot. The leaves are narrow and oblong with scattered hairs, especially on the midrib and veins. Its large, purple head and flowers droop or nod when mature.

Nodding thistle is considered to be the most aggressive thistle in New Zealand. It is capable of total ground cover and establishes quickly in pastures.

The thistles occur in isolated patches throughout Northland, and nodding thistle is common on the Poutō Peninsula. These thistles are not currently major pest plants in Northland, because of the restricted distribution. If left unchecked, they have the potential to be a considerable threat, particularly to coastal farms.

Objectives (Five Year)

- To contain Californian and nodding thistle to the present areas of infestation.
- To ensure that all sites of Californian and nodding thistle are controlled with an annual control programme prior to seeding.
- To ensure the distribution of biological control agents throughout the region on widespread thistle sites.

Pest Management Methods

Total Control:

- Occupiers are required to kill all individuals of Californian and nodding thistle wherever they occur on the property.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification and control of plant pests.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.



Rules

1. No person shall knowingly distribute, transport or release any Californian or nodding thistle (including any seeds or live vegetation) within the Northland region.
2. Land owners or occupiers must destroy all Californian or nodding thistle on land they occupy prior to flowering.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

GIANT REED

(Arundo donax)

Giant reed is a clump-forming, bamboo-like grass with a dense root mass and short rhizomes. It can grow up to 5m in height. Hollow stems, up to 4cm across, are initially erect but become semi-lax over time. They are bluish-white with parallel veins alternately arranged, clasping the stems. A plume-like flower head is produced at the top of the stem in late summer.

Giant reed is widespread throughout Northland. The plant has been sold as an ornamental and used as an erosion control plant, particularly on riverbank slips near roads. Giant reed grows on a wide range of sites from dry banks to semi-aquatic situations forming dense stands. It chokes small rivers and drains causing flooding, spreads slowly onto adjacent land and is very invasive, displacing all other vegetation. It spreads downstream in floods and grows from stem or root fragments.

Objectives (Five Year)

- To identify and record the extent of infestations in Northland.
- To develop a control programme to contain the spread of giant reed in Northland.

Pest Management Methods

Surveillance:

- Ongoing surveillance to locate infestations and record infestation magnitude in Northland.

Site-led Programmes:

- NRC will assist communities and stakeholders to control giant reed where it impacts upon local values.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification and control of plant pests.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.



Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any giant reed within the Northland region.
2. No person shall knowingly distribute, transport or release any giant reed (including any seeds or live vegetation) within the Northland region.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest plant population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain the pest plant population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

LANTANA

(Lantana camara, all varieties)

Also known as: shrub verbena, wild sage, yellow sage, red flowered sage

Lantana is a low, erect or scrambling shrub with backwards-pointing prickles and a strong root system. Its leaves are strong-smelling when crushed, wrinkly and more or less oval, with dense and often prickly hairs on the upper surface. The small flowers can be many different colours and occur in clusters. Flowers are followed by small blue-black fruit.

Lantana camara var aculeata is the most common variety of lantana found in New Zealand. It has small cream and pink flowers in bunches.

Lantana forms dense impenetrable thickets. It invades bush edges, pasture, roadsides and wasteland, where it replaces all other vegetation. It is poisonous to stock and humans.

Lantana is a major weed of both natural and agricultural ecosystems overseas. Lantana is found throughout Northland with the heaviest infestations located near old settlement areas in the Hokianga and near Whangaroa.

Pest Classification

Lantana is a containment pest throughout Northland.

Objectives (Five Year)

- To contain the lantana to core infestation areas.
- To minimise the effects of lantana on environmental and economic values in Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of lantana.

Pest Management Methods

NRC Response:

- NRC will develop plans which identify major lantana populations and encourage or undertake control aimed at eradication of lantana at outlying sites.

Site-led Programmes:

- NRC will assist communities and stakeholders to control lantana where it impacts upon local values.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification and control of plant pests.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.



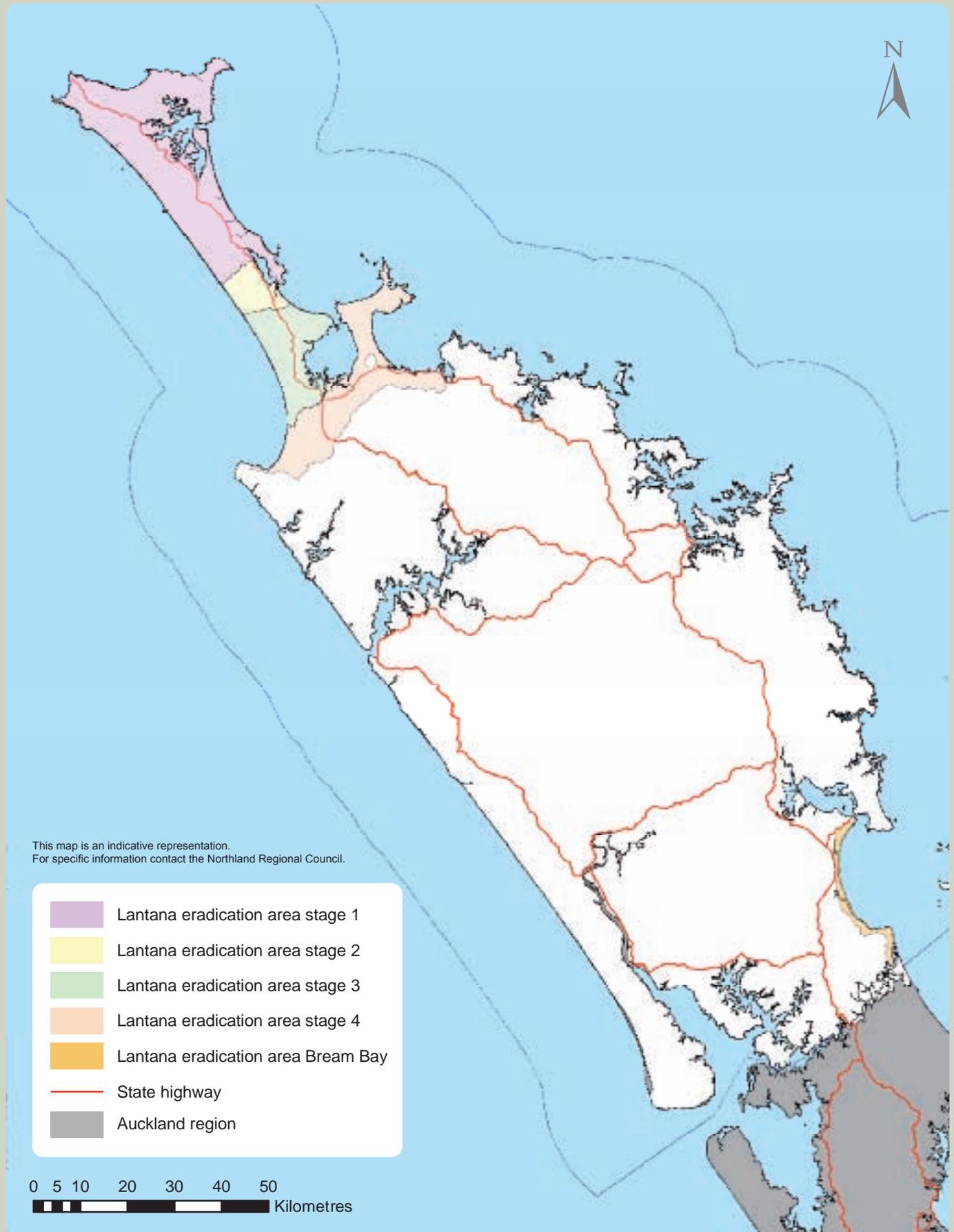
Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any lantana within the Northland region.
2. No person shall knowingly distribute, transport or release any lantana (including any seeds or live vegetation) within the Northland region.
3. No person shall knowingly possess any lantana (including any seeds or live vegetation) within an area which has been defined under an operational plan as a total control area.
4. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest plant population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain the pest plant population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

See lantana eradication areas (Figure 6) overleaf.

Figure 6: Lantana eradication areas.



MANCHURIAN WILD RICE

(Zizania latifolia)

Also known as: *Manchurian rice grass*

Manchurian wild rice is a tall perennial grass that grows up to 3m tall. It has harsh, erect, dull grey-green leaves, which have a stout midrib and taper to a point. Purplish or red-brown flower heads are produced from November to December. Manchurian wild rice is often confused with native raupo or flax. Raupo is smaller and has shorter, softer leaves with a characteristic twist and flax leaves are smoother and shiny.

Manchurian wild rice is found primarily in the Kaipara area, especially along the banks of the Northern Wairoa river, where it is widespread. There are other small infestations in the Kaipara, Far North and Whāngārei Districts. Manchurian wild rice forms dense stands in aquatic or semi-terrestrial situations. It can block drains, cause flooding, and invade pasture. It can cause good land to become water-logged and swampy. It is very invasive and quickly spreads on land that is not grazed or controlled.

Objectives (Five Year)

- To identify all infestations of Manchurian wild rice outside the containment area.
- To support a MAFBNZ funded control programme to reduce density levels at all sites outside the containment area.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of Manchurian wild rice.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other Crown agencies such as DOC, with a particular focus on pathways, vectors and areas of significance.
- Sightings reported from outside the containment area will be investigated and response implemented.

Incursion Response:

- MAFBNZ is the lead agency for Manchurian wild rice and the NRC will provide support as needed during containment of infestations.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification of plant pests to assist in surveillance.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.



Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

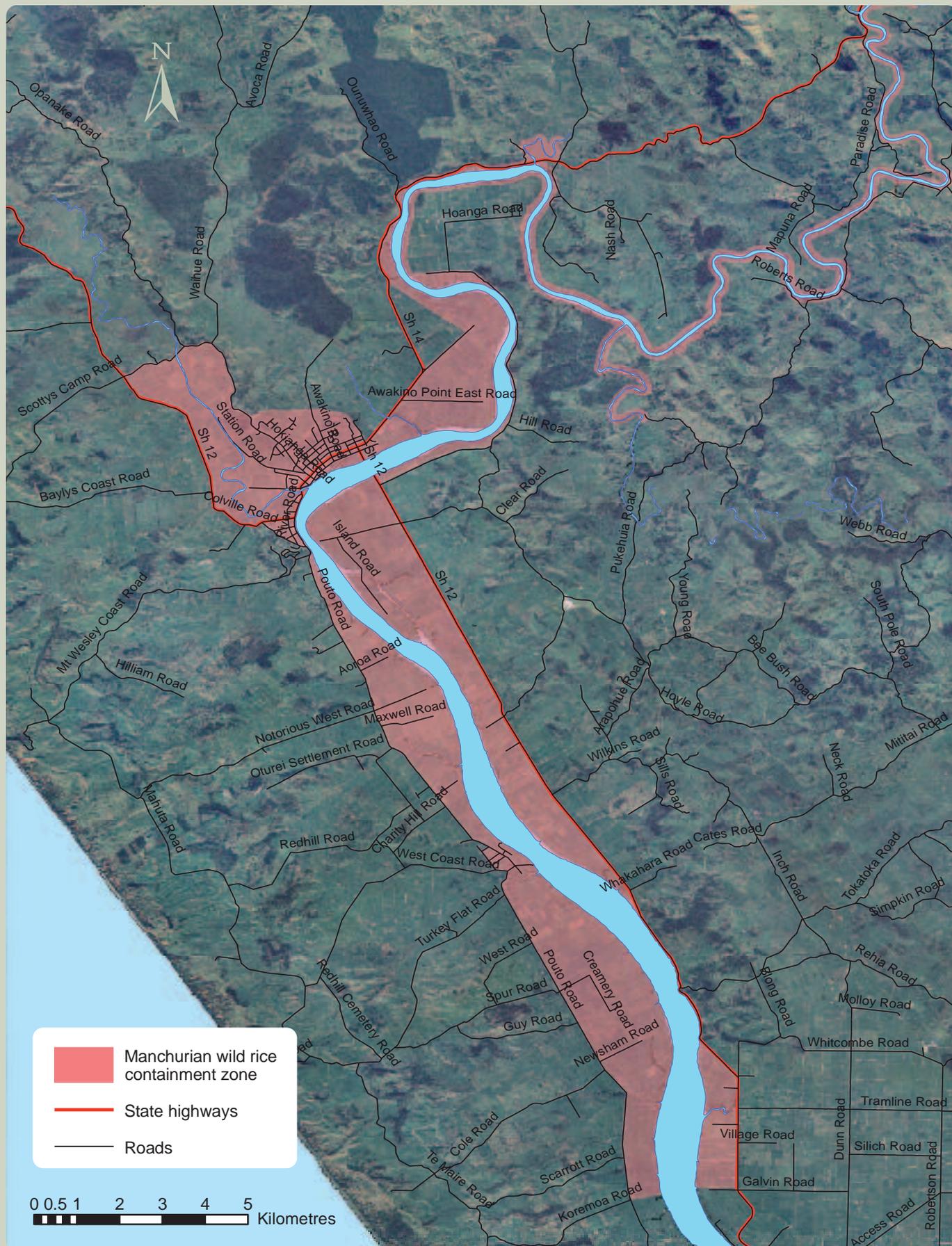
Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any Manchurian wild rice within the Northland region.
2. No person shall knowingly distribute, transport or release any Manchurian wild rice (including any seeds or live vegetation) within the Northland region.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

See Manchurian wild rice containment zones (Figure 7) overleaf.

Figure 7: Manchurian wild rice containment zone.



4.4 Suppression Plants

Suppression plants are plant pests that are widespread in suitable habitat throughout the region. The intention is to reduce pest densities so that impacts on the community and the environment are decreased.

Objectives and Methods for Suppression Plants

The objectives and methods for the suppression plant pests apply to all species in this category.

Objectives (Five Year)

- To minimise the effects of the suppression plants on environmental and economic values in Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of the suppression plants.

Pest Management Methods

The following pest management methods apply to the suppression plants as outlined in Table 1.

Occupier Control:

The requirements for occupier control differ, and are clearly specified in the rules for each species. The requirements may include:

- Boundary control - occupiers are required to control the suppression plant within an appropriate distance of the property boundaries.
- Quarry control - owners or occupiers of quarries and metal stockpile areas are required to control the suppression plant within operational areas. Operational areas include overburden soil storage stockpiles, pits and faces,

extraction areas, raw material stockpiles, processing areas, product stockpiles, haulways and other vehicle routes.

- Road and rail side control - road and rail controlling authorities are required to progressively control the suppression plant on the region’s formed road and rail reserves where the adjoining land is clear or only sparsely infested, following an approved programme.
- Occupier road side control - occupiers are required to destroy the suppression plant between their property boundary and the carriageway of any adjoining road.
- Occupiers are required to control the suppression plant where it causes serious health effects.

Site-led Programmes:

- NRC will assist communities and stakeholders to control the suppression plant where it impacts upon local values.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification and control of plant pests.
- NRC will provide advice, and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about plant pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Biological Control:

- NRC will support the use of biological control agents where the criteria for control and use of the biological control agent are met.

Table 1: Pest management methods for suppression plants.

Pest	Occupier Control	Site-led Programmes	Education	Research	Biological Control
Alligator weed		•	•	•	•
Gorse	•	•	•	•	•
Gravel groundsel	•		•	•	
Pampas	•	•	•	•	
Privet	•	•	•	•	
Ragwort	•		•	•	•
Wild ginger	•	•	•	•	

ALLIGATOR WEED

(Alternanthera philoxeroides)

Alligator weed is a perennial emergent aquatic plant that can also grow in terrestrial areas. Its leaves are green, hairless, waxy and have a conspicuous midrib. The flowers resemble those of white clover but are smaller and each cluster is produced on a long stalk. The plant will not root in water deeper than 2-3m however a marginal weed bed can support a floating mat of vegetation in deeper water.

Alligator weed is widely distributed in rivers, streams and ponds throughout the region. It also occurs in terrestrial areas, especially low lying areas with clay soils. Alligator weed forms extensive floating mats. These out-compete other species and block waterways, causing silt build up, flooding and degradation of habitat for aquatic plants and animals. Alligator weed is also invasive in terrestrial areas affecting crops and pasture. It is toxic to livestock.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any alligator weed within the Northland region.
2. No person shall knowingly distribute, transport or release any alligator weed (including any seeds or live vegetation) within the Northland region.

GORSE

(Ulex species)

Gorse is a deep-rooted, woody perennial shrub that can grow to 4m tall. It has densely spined branches and is woody when mature. Gorse has bright yellow flowers from May to November, and black seed pods in summer. Gorse seed reserves in the soil are long lasting and abundant under and near established infestations.

Gorse is a major pest in Northland, affecting large areas of land. It has the ability to occupy a wide range of soil types, and very quickly colonises new areas, forming dense thickets. It invades pasture land and roadsides as well as low growing or regenerating native vegetation. It harbours other pests, for example rabbits, and restricts the movement of stock and people.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any gorse within the Northland region.
2. No person shall knowingly distribute, transport or release any gorse (including any seeds or live vegetation) within the Northland region.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest plant population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain the pest plant population densities to those agreed to in the management plan.
- 4 Land occupiers must:
 - a. Destroy all gorse within 10 metres of a property boundary where the neighbouring property is clear of gorse and is clear within 10 metres of that boundary;



ARC

3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest plant population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain the pest plant population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



- b. Destroy all gorse in the operational areas of a quarry; and
 - i. a 50 metre strip of land around the operational areas of a quarry, or;
 - ii. where existing vegetation reduces the risk of gorse spreading, the 50 metre buffer zone may be reduced by written agreement with the NRC.
5. Every road or rail controlling authority shall implement a control programme aimed at progressively controlling gorse on formed road or rail reserves under their jurisdiction where adjoining land is clear or only sparsely infested with gorse, in accordance with a five year management plan which shall be negotiated with, and agreed to by, the Northland Regional Council.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

GRAVEL GROUNDSEL

(*Senecio skirrhodon*)

Gravel groundsel is a member of the daisy family. It is a semi annual to perennial bush-like herb and usually grows to 25-40cm tall. Gravel groundsel flowers are bright yellow, and appear individually at the tips of stems. It has downy, wind-borne seeds.

Gravel groundsel is found in localised areas, but in recent years populations have increased significantly, particularly in the Far North. It is an aggressive, prolific flowering plant that invades grasslands. It is not eaten by cattle and reduces pasture productivity.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any gravel groundsel within the Northland region.
2. No person shall knowingly distribute, transport or release any gravel groundsel (including any seeds or live vegetation) within the Northland region.
3. Land occupiers must:
 - a. Destroy all gravel groundsel within 50 metres of a property boundary where the neighbouring property is



clear of gravel groundsel and is clear within 50 metres of that boundary;

- b. Destroy all gravel groundsel between their property boundary and the carriageway of any adjoining road, where this land is within 50 metres of a property free of gravel groundsel.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

PAMPAS

(*Cortaderia jubata* and *C.selloana*)

Pampas is a perennial, tussock-like grass, and there are two species present in Northland (*Cortaderia jubata* and *Cortaderia selloana*). Both have coarse abrasive leaves and grow 2-3m high. The plant's flowering stems, which can be up to 5m high, have distinctive, erect, fluffy white or pinky-purple flower heads. They flower from January to March (*C. jubata*) and March to May (*C.selloana*). The plants may be confused with the three native toe toe species which have more creamy-yellow flower heads. The pampas species also have dead leaf bases which spiral, resembling wood shavings.

Pampas is widespread throughout Northland. It inhabits a range of areas including dunelands, plantation forests, quarries, roadsides and disturbed native forests. Pampas is a very invasive plant, forming dense, often impenetrable, stands. It excludes other vegetation, poses a fire risk in summer, and reduces visibility on roads. It also provides habitats for possums and rats, and impedes access.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any pampas within the Northland region.
2. No person shall knowingly distribute, transport or release any pampas (including any seeds or live vegetation) within the Northland region.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest plant population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain the pest plant population densities to those agreed to in the management plan.



4. Land occupiers must:
 - a. Destroy all pampas within 10 metres of a property boundary where the boundary adjoins a road or rail reserve clear of pampas;
 - b. Destroy all pampas in the operational areas of a quarry; and
 - i. a 50 metre strip of land around the operational areas of a quarry, or;
 - ii. where existing vegetation reduces the risk of pampas spreading, the 50 metre buffer zone may be reduced by written agreement with the NRC.
5. Every road or rail controlling authority shall implement a control programme aimed at progressively controlling pampas on formed road or rail reserves under their jurisdiction where adjoining land is clear or only sparsely infested with pampas, in accordance with a five year management plan which shall be negotiated with, and agreed to by, the Northland Regional Council.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

PRIVET

(Ligustrum species)

Privet is an evergreen shrub or tree, and four species are found in New Zealand: tree privet (*Ligustrum lucidum*), Chinese privet (*L. sinense*), privet (*L. ovalifolium*) and common privet (*L. vulgare*). Tree and Chinese privet are common in Northland. Tree privet grows 5-10m high and has long glossy leaves. It has creamy flowers in summer and small black berries. Chinese privet grows to 5m in height. It has shorter, less glossy leaves, and produces white flowers in spring.

Chinese and tree privet are found throughout Northland, and are generally present near sites of human habitation, where they have been planted as hedges or specimen trees. Privet inhabits bush, gardens, roadsides and ungrazed wasteland areas. The scent of privet contributes to respiratory disorders and has associated human health impacts. Privet prevents native plant regeneration and can completely dominate areas of bush. It can also restrict visibility along roadsides and form barriers to recreational activities. Privet is toxic to livestock. When growing on riverbanks, privet catches flood debris and impedes flood flows.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any privet within the Northland region.
2. No person shall knowingly distribute, transport or release any privet (including any seeds or live vegetation) within the Northland region.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest plant population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain the pest plant population densities to those agreed to in the management plan.
4. Land occupiers must:
 - a. Destroy all privet within 10 metres of a property boundary where the boundary adjoins a road or rail reserve that is clear of privet;
 - b. Destroy all privet within 50 metres of an affected individual's residence or fixed workplace where the privet exacerbates human health problems. Where privet is claimed to exacerbate human health problems, a medical certificate/letter is required as proof of this claim.



5. Every road or rail controlling authority shall implement a control programme aimed at progressively controlling privet on formed road or rail reserves under their jurisdiction where adjoining land is clear or only sparsely infested with privet, in accordance with a five year management plan which shall be negotiated with, and agreed to by, the NRC.
6. Privet tree hedges are permitted providing that hedges are maintained in a trimmed state that prevents flowering.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

RAGWORT

(Jacobaea vulgaris)

Also known as: Senecia jacobaea

Ragwort is a member of the daisy family. It is an erect, annual-to-perennial herb and usually grows to 45-70cm tall, but can reach 1.6m. It has reddish-purple stems and wrinkled, divided leaves which are dark green on top with a downy lining. The leaves appear in a rosette that grows into a dense cluster. Ragwort flowers are bright yellow and appear in clusters. It has downy, parachute-like seeds.

Ragwort is found throughout the region. The largest infestations are generally found on reverted farmland and land that is unoccupied. Ragwort is an aggressive, prolific flowering plant. It reduces the productivity of the land and is toxic to livestock, particularly cattle and horses. Sheep are more resistant to its poison although deaths do sometimes occur.

Since the widespread introduction of the flea beetle (biological control agent for ragwort), average infestation densities throughout Northland have steadily declined to levels where it is no longer a significant threat on most properties.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any ragwort within the Northland region.
2. No person shall knowingly distribute, transport or release any ragwort (including any seeds or live vegetation) within the Northland region.
3. Land occupiers must:
 - a. Destroy all ragwort within 50 metres of a property boundary where the neighbouring property is clear of ragwort and is clear within 50 metres of that boundary;
 - b. Destroy all ragwort between their property boundary and the carriageway of any adjoining road, where this land is within 50 metres of a property free of ragwort;
 - c. Destroy all ragwort in the operational areas of a quarry; and
 - i. a 50 metre strip of land around the operational areas of a quarry, or;
 - ii. where existing vegetation reduces the risk of ragwort spreading, the 50 metre buffer zone may be reduced by written agreement with the NRC.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



ARC

WILD GINGER

(Hedychium flavescens and H. gardnerianum)

The name 'wild ginger' applies to two species, yellow ginger (*Hedychium flavescens*) and kahili ginger (*H. gardnerianum*). Kahili ginger is the most common and most invasive of the two. Both species form dense colonies in native bush, on road sides and river banks, smothering and eventually replacing all other species. Wild ginger has a faint ginger smell and taste. Young plants are palatable to livestock, and both species tend to invade all areas where stock are excluded.

Both species are non-woody perennials, growing from thick-branching rhizomes (swollen underground stems). Rhizomes form dense beds up to 1m deep excluding all other species. Kahili ginger produces scented, lemon-yellow flowers with conspicuous red stamens, followed by fruiting spikes with fleshy orange fruits. Yellow ginger produces scented, cream-coloured flowers in clusters, from May to June and does not produce fruit.

Wild ginger is found in many parts of the region, particularly in and adjacent to coastal settlements. Major infestations are found in the Herekino, Whangaroa, Kohukohu, Rāwene, Waimamaku, Waipoua, Helena Bay, McLeods Bay and Whāngārei areas.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any wild ginger within the Northland region.
2. No person shall knowingly distribute, transport or release any wild ginger (including any seeds or live vegetation) within the Northland region.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest plant population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain the pest plant population densities to those agreed to in the management plan.



4. Land occupiers must destroy all wild ginger within 10 metres of a property boundary where the boundary adjoins a road or rail reserve clear of wild ginger;
5. Every road or rail controlling authority shall implement a control programme aimed at progressively controlling wild ginger on formed road or rail reserves under their jurisdiction where adjoining land is clear or only sparsely infested with wild ginger, in accordance with a five year management plan which shall be negotiated with, and agreed to by, the NRC.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

4.5 Community Pest Control Area (CPCA) Plant Pests

The NRC aims to assist communities and stakeholders to control plant pests where they impact upon local values. Species that are regionally or locally common may be considered for a CPCA or interagency site-led programme where significant regional environmental, social or economic benefits are likely. The following species may be considered for inclusion in a CPCA (Table 2 and 3).

Table 2: CPCA plant pests that are also banned from sale and distribution in Northland.

Common Name	Scientific Name	Common Name	Scientific Name
African club moss	<i>Selaginella kraussiana</i>	Japanese spindle tree	<i>Euonymus japonicus</i>
Aristea	<i>Aristea ecklonii</i>	Jasmine	<i>Jasminum polyanthum</i>
Banana passionfruit	<i>Passiflora tripartita</i> (all subspecies) and <i>P. tarminiana</i>	Kangaroo acacia	<i>Acacia paradoxa</i>
Blue morning glory	<i>Ipomoea indica</i>	Lagarosiphon	<i>Lagarosiphon major</i>
Blue passion flower	<i>Passiflora caerulea</i>	Madeira vine	<i>Anredera cordifolia</i>
Broom	<i>Cytisus scoparius</i>	Mexican daisy	<i>Erigeron karvinskianus</i>
Brush wattle	<i>Paraserianthes lophantha</i>	Monkey apple	<i>Syzygium smithii</i>
Buddleia	<i>Buddleja davidii</i>	Moth plant	<i>Araujia hortorum</i>
Boneseed	<i>Chrysanthemoides monilifera</i>	Oxylobium	<i>Callistachys lanceolata</i>
Cape honey flower	<i>Melianthus major</i>	Paperbark poplar	<i>Melaleuca quinquenervia</i>
Cape ivy	<i>Senecio angulatus</i>	Parrots feather	<i>Myriophyllum aquaticum</i>
Cat's claw creeper	<i>Macfadyena unguis-cati</i>	Periwinkle	<i>Vinca major</i>
Century plant	<i>Agave americana</i>	Plectranthus	<i>Plectranthus ciliatus</i>
Climbing Asparagus	<i>Asparagus scandens</i>	Prickly Moses	<i>Acacia verticillata</i>
Coastal banksia	<i>Banksia integrifolia</i>	Reed sweet grass	<i>Glyceria spp</i>
Cotoneaster	<i>Cotoneaster glaucophyllus</i> , <i>C. franchetii</i>	Queensland poplar	<i>Homalanthus populifolius</i>
Egeria (oxygen weed)	<i>Egeria densa</i>	Sexton's bride	<i>Rhaphiolepis umbellata</i>
Elaeagnus	<i>Elaeagnus x reflexa</i>	Smilax	<i>Asparagus asparagoides</i>
German ivy	<i>Delairea odorata</i>	Sweet pea shrub	<i>Polygala myrtifolia</i> (not incl. cv. "Grandiflora")
Great bindweed	<i>Calystegia silvatica</i>	Sydney golden wattle	<i>Acacia longifolia</i>
Green cestrum	<i>Cestrum parqui</i>	Taiwan cherry	<i>Prunus campanulata</i>
Grey and crack willows	<i>Salix cinerea</i> , <i>Salix fragilis</i>	Tuber ladder fern	<i>Nephrolepis cordifolia</i>
Himalayan honeysuckle	<i>Leycesteria formosa</i>	Velvet groundsel	<i>Roldana petasitis</i>
Hornwort	<i>Ceratophyllum demersum</i>	Wandering jew	<i>Tradescantia fluminensis</i>
Japanese honeysuckle	<i>Lonicera japonica</i>	Woolly nightshade	<i>Solanum mauritianum</i>

Table 3: CPCA plant pests that are not banned from sale and distribution in Northland.

Common Name	Scientific Name	Common Name	Scientific Name
Agapanthus	<i>Agapanthus praecox</i>	Elodea (oxygen weed)	<i>Elodea canadensis</i>
Arum lily	<i>Zantedeschia aethiopica</i>	Phoenix palm	<i>Phoenix canariensis</i>
Bangalow palm	<i>Archontophoenix cunninghamiana</i>	Queen of the night	<i>Cestrum nocturnum</i>
Brazilian Pepper Tree	<i>Schinus terebinthifolius</i>	Wilding pines	<i>Pinus radiata, P. contorta, and P. pinaster</i>
Coral / Flame tree	<i>Erythrina xskykesii</i>		

These species are widespread throughout the region, and can damage native ecosystems by smothering existing vegetation, and preventing native plant regeneration. When growing in water bodies, some species catch flood debris, impede flood flows, impact on water quality, and impede recreational activities. Where a plant pest becomes dominant, the productivity of land may be severely reduced, and stock or crops may be devalued. Cultural and traditional values associated with a significant area may also be affected.

Objectives (Five Year)

To assist communities and stakeholders to manage local impacts of these species.

Pest Management Methods

Site-led Programmes:

- NRC will assist communities and stakeholders to control these species where they impact upon local values.

Education:

- NRC will provide advice to NRC staff and stakeholders on practices which limit establishment of plant pests.

Rules

1. No person shall sell, offer for sale, propagate, breed or multiply any of the plant pests listed in Table 2 within the Northland region.
2. No person shall knowingly distribute, transport or release any of the plant pests listed in Table 2 (including any seeds or live vegetation) within the Northland region.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest plant population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain the pest plant population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

4.6 Risk Assessment Plant Pests

Risk assessment plant pests (Table 4) are those species that are of potential concern to the region, but little is known about the distribution or the risks posed. While the extent of potential impacts is unknown, these species may have the ability to alter native ecosystems and compete with native species for food and space. Further information about the ecological requirements, population behaviour, and control methods for these species is needed. The intention is to improve understanding about these plants in the region so that they can be classified and managed appropriately when the Strategy is reviewed.

Table 4: Risk assessment plants.

Common Name	Scientific Name	Common Name	Scientific Name
Bat-wing passion flower	<i>Passiflora apetala</i>	Fork-leaved hakea	<i>Hakea drupacea</i>
Camphor laurel	<i>Cinnamomum camphora</i>	Himalayan fairy grass	<i>Miscanthus nepalensis</i>
Chinese windmill palm	<i>Trachycarpus fortunei</i>	Lily of the valley vine	<i>Salpichroa origanifolia</i>
Dusky coral pea	<i>Kennedia rubicunda</i>	Norfolk Island hibiscus	<i>Lagunaria patersonia</i> subsp. <i>patersonia</i>
English ivy	<i>Hedera helix</i>	Sharp rush	<i>Juncus acutus</i>

Objectives (Five Year)

- To assess the risks, impacts and options for managing these species.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of plant pests.

Pest Management Methods

- The NRC will undertake surveillance, research and raise public awareness of risk assessment pests to assist with classifying these pests and managing them appropriately.
- The NRC will provide advice and information to the public, and will support initiatives to minimise any adverse impacts they have.
- If surveillance indicates that a risk assessment pest poses a threat to the region, and eradication is achievable, control may be carried out by the NRC and their contractors or, with agreement, by other agencies.

Rules

1. Where a management agency has undertaken initial control work and/or supplied resources to reduce pest population densities to a level agreed to in a management plan for the area, the pests shall be maintained at the agreed level by the signatories to the management plan.

A breach of these rule, without reasonable excuse, is an offence under Section 154(r) of the Act.

5. ANIMAL PEST MANAGEMENT STRATEGY

The animal pests included in the Strategy all cause, or have the potential to cause, adverse impacts on Northland's environmental, economic, cultural and recreational values.

Common Name	Scientific Name	Pest Classification	Page
Argentine ant	<i>Linepithema humile</i>	Suppression	54
Bearded dragon	<i>Amphibolurus barbatus</i>	Risk Assessment	65
Big headed ant	<i>Pheidole megacephala</i>	Exclusion	46
Blue-tongued skink	<i>Tiliqua scincoides and Tiliqua nigrolutea</i>	Risk Assessment	65
Brown bullhead catfish	<i>Ameiurus nebulosus</i>	Suppression	55
Cats - feral and stray	<i>Felis catus</i>	Suppression	55
Caudo	<i>Phallocerus caudimaculatus</i>	Risk Assessment	65
Common wasp	<i>Vespula vulgaris</i>	Suppression	64
Crazy ant	<i>Paratrechina longicornis</i>	Exclusion	46
Darwin's ant	<i>Doleromyrma darwiniana</i>	Suppression	54
Eastern water dragon	<i>Physignathus lesueurii lesueurii</i>	Risk Assessment	65
Feral deer	<i>All Cervus and Odocoileus species and hybrids</i>	Eradication	48
Feral goat	<i>Capra hircus</i>	Suppression	56
Feral pig	<i>Sus scrofa</i>	Suppression	58
Ferret	<i>Mustela furo</i>	Suppression	61
Gambusia	<i>Gambusia affinis</i>	Suppression	58
German wasp	<i>Vespula germanica</i>	Suppression	64
Ghost ant	<i>Tapinoma melanocephalum</i>	Exclusion	46
Guava moth	<i>Coscinoptycha improbana</i>	Suppression	59
Hare	<i>Lepus europaeus occidentalis</i>	Suppression	59
Hedgehog	<i>Erinaceus europaeus occidentalis</i>	Suppression	60
Kauri dieback	<i>Phytophthora taxon Agathis</i>	Containment	52
Koi carp	<i>Cyprinus carpio</i>	Containment	51
Magpie	<i>Gymnorhina tibicen</i>	Suppression	60
Marron	<i>Cherax tenuimanus</i>	Exclusion	46
Mouse	<i>Mus musculus</i>	Suppression	63
Myna	<i>Acridotheres tristis</i>	Suppression	61
Norway rat	<i>Rattus norvegicus</i>	Suppression	63
Orfe	<i>Leuciscus idus</i>	Exclusion	47
Perch	<i>Perca fluviatilis</i>	Containment	51
Possum	<i>Trichosurus vulpecula</i>	Suppression	62
Rabbit	<i>Oryctolagus cuniculus</i>	Suppression	62
Rainbow lorikeet	<i>Trichoglossus haematodus</i>	Exclusion	47
Rainbow skink	<i>Lampropholis delicata</i>	Risk Assessment	65
Red-eared slider turtle	<i>Trachemys scripta elegans</i>	Risk Assessment	65
Rook	<i>Corvus frugilegus</i>	Exclusion	48
Rudd	<i>Scardinius erythrophthalmus</i>	Suppression	63
Shingleback lizard	<i>Trachydosaurus rugosus</i>	Risk Assessment	65
Ship rat	<i>Rattus rattus</i>	Suppression	63
Snake-neck turtle	<i>Chelodina longicollis</i>	Risk Assessment	65
Stoat	<i>Mustela erminea</i>	Suppression	61
Sulphur crested cockatoo	<i>Cacatua galerita</i>	Risk Assessment	65
Tench	<i>Tinca tinca</i>	Containment	51
Tropical fire ant	<i>Solenopsis geminata</i>	Exclusion	46
Tropical grass webworm	<i>Herpetogramma licarsisalis</i>	Suppression	64
Wallaby	<i>Macropus, Petrogale or Wallabia species</i>	Exclusion	48
Weasel	<i>Mustela nivalis</i>	Suppression	61

5.1 Exclusion Animals

Exclusion animals are potential pests which are not known to have established in Northland or have previously established and have been eradicated. These animal pests all have the potential to establish in the region, and are capable of causing adverse effects. The intention of the Strategy is to prevent these animal pests from entering and establishing in Northland over the life of the Strategy.

Objectives and Methods for Exclusion Animals

The objectives and methods for the exclusion animal pests apply to all species in this category.

Objectives (Five Year)

- To prevent the exclusion animal pests from becoming established in Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of the exclusion animal pests and encourage reports of sightings.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other Crown agencies such as DOC, with a particular focus on pathways, vectors and areas of significance.
- Reported sightings will be investigated and response implemented.

Incursion Response (for ants, marron and rainbow lorikeet):

- Eradication of infestations of the exclusion animal pests will be attempted by the NRC in conjunction with relevant Crown agencies and stakeholders where practicable.

NRC Response (for orfe, rook and wallaby):

- Eradication of infestations of orfe, rook or wallaby will be attempted by the NRC and their contractors or, with agreement, by other agencies if practicable.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification of animal pests to assist in surveillance.
- NRC will provide advice and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about animal pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

ANTS

Big headed ant (*Pheidole megacephala*)

Crazy ant (*Paratrechina longicornis*)

Ghost ant (*Tapinoma melanocephalum*)

Tropical fire ant (*Solenopsis geminata*)

These ants vary in their physical characteristics and positive identification requires a microscope. However, their common names are descriptive of features. All have biological characteristics and invasive habits that pose a similar or greater risk to the region's biodiversity, cultural and economic values as Argentine and Darwin's ants.

Ant risk assessment has been carried out for all these species based on their biological traits, invasive history elsewhere, pathways for spread, climate match, impact on native environment and likely pest status in New Zealand. There is a high risk of establishment and detrimental impact on biodiversity.

All these species are aggressive, capable of displacing indigenous ants, are a major nuisance pest where they have become established, indirectly and directly affect horticulture and in some instances affect human health. Crazy ant and tropical fire ant are classified as among "100 of the World's Worst Invasive Species" by the World Conservation Union. The big headed ant is established in east Auckland whilst the other listed species are commonly intercepted at the border (including nests).

MARRON

(*Cherax tenuimanus*)

Marron are large fresh water crayfish native to Western Australia. They have large smooth front claws, and range in colour from jet black to brown. Marron can grow to around 380mm long. They prefer sandy areas in rivers and dams, particularly where organic matter accumulates. Marron like areas which have lots of different terrain (fallen trees, rocks), and they do not like high salinity.

Marron pose a significant threat to New Zealand's freshwater environment. They have the ability to become widespread in New Zealand's freshwater systems, competing with native species such as the freshwater crayfish (koura).

All known populations of marron in New Zealand have been eradicated however other unknown populations may still exist.

Rules

1. No person shall sell, offer for sale, breed or multiply any marron, within the Northland region.
2. No person shall knowingly possess, distribute, transport or release any marron, within or into the Northland region.
3. Every person who sees a marron, or suspects the presence of any marron shall immediately report the sighting to the NRC or MAFBNZ.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



Tropical fire ant

Rules

1. No person shall sell, offer for sale, breed or multiply any big headed ant, crazy ant, ghost ant or tropical fire ant, within the Northland region.
2. No person shall knowingly possess, distribute, transport or release any big headed ant, crazy ant, ghost ant or tropical fire ant, within or into the Northland region.
3. Every person who sees a big headed ant, crazy ant, ghost ant or tropical fire ant, or suspects the presence of any shall immediately report the sighting to the NRC or MAFBNZ.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



ORFE

(Leuciscus idus)

Orfe were illegally introduced to New Zealand in the 1980s, and released into the wild as coarse angling fish. The current status of wild populations is unknown but it seems likely that orfe persist in the wild. The variety of orfe present in New Zealand, the golden orfe, is derived from ornamental pond stocks and they closely resemble rudd. Orfe have smaller scales and their fins are more orange than red coloured.

Orfe live in slow-flowing waters. They eat aquatic invertebrates such as worms and snails, but large orfe may consume other fish and aquatic vegetation. They are prolific breeders and large females may contain tens of thousands of eggs. Orfe can tolerate high levels of salinity so may be able to colonise brackish water and estuarine habitats. These are often critical habitats for native species. Orfe were released into one lake in the Northland region, but do not seem to have established.

Rules

1. No person shall sell, offer for sale, breed or multiply any orfe within the Northland region.
2. No person shall knowingly possess, distribute, transport or release any orfe within or into the Northland region.
3. Every person who sees an orfe, or suspects the presence of any orfe shall immediately report the sighting to the NRC.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



Piet Spaans

RAINBOW LORIKEET

(Trichoglossus haematodus)

Rainbow lorikeets are distinctive multi-coloured parrots, about 30cm long. They have a bright red beak and eyes, with a blue head and belly, green wings, tail and back, and an orange/yellow breast. They have a distinctive screeching call. Rainbow lorikeets feed primarily on pollen, nectar and fruits, but they may feed on seeds. They are almost always seen in pairs or in flocks.

Rainbow lorikeets are prolific breeders, with pairs known to rear as many as three successive broods in a single season enabling the feral population to increase rapidly. They compete with native birds for food and nesting sites. Rainbow lorikeets can damage apples, grapes and other soft fruit. They pose a threat to the commercial fruit growing industry, with the potential to significantly impact orchards and vineyards. Rainbow lorikeets can carry diseases that can threaten the health of native bird species.

Rainbow lorikeets were introduced to New Zealand from Australia as cage birds, and they are allowed to be bred in captivity and sold. They are kept as pets in cages and aviaries throughout the country. Significant numbers of captive-reared birds were illegally and deliberately released in the Auckland area in the 1990s and started breeding in the wild.

Rules

1. No person shall release any rainbow lorikeet within the Northland region.
2. Every person who sees an uncaged rainbow lorikeet, or suspects the presence of any uncaged rainbow lorikeet shall immediately report the sighting to the NRC.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



D. Gordon E. Robertson

ROOK

(Corvus frugilegus)

Rooks are large birds approximately the same size as magpies. They are totally black except for a greyish naked face, and have a short neck and a large strong bill. Rooks fly with low wing beats and have ragged wing tips. Rooks are gregarious birds and live in colonies. They nest in tall trees and usually feed in flocks although lone birds can be seen away from the flock.

Rooks can cause serious damage to farms and market gardens as they feed on most types of crops, either the seed heads or by pulling out young plants. They occasionally pierce fruit such as apples and pears with their bills. Rooks can also tear up large areas of pasture looking for invertebrates. There are no known populations of rooks in Northland.

Rules

1. No person shall sell, offer for sale, breed or multiply any rook within the Northland region.
2. No person shall knowingly possess, distribute, transport or release any rook within or into the Northland region.
3. Every person who sees a rook, or suspects the presence of any rook shall immediately report the sighting to the NRC.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



Hi Zell

WALLABY

(Macropus, Petrogale or Wallabia species)

Wallabies are small marsupial animals that look like small kangaroos. They are silver/grey to dark brown in colour. Wallabies eat grasses, native shrubs and trees. They live in scrub and coastal forest margins where their browsing of native plants changes the forest ecology with subsequent negative impacts on the indigenous flora and fauna.

Wallabies have the potential to prevent regeneration and significantly reduce the diversity of natural areas. They can also cause serious economic damage to pastoral, horticultural and forestry activities.

There are no known Wallaby populations in Northland. They are found on Kawau Island, just south of the boundary with the Auckland region, and there are large numbers present in the Rotorua Lakes area and in North Otago.

Rules

1. No person shall sell, offer for sale, breed or multiply any wallaby within the Northland region.
2. No person shall knowingly possess, distribute, transport or release any wallaby within or into the Northland region.
3. Every person who sees a wallaby, or suspects the presence of any wallaby shall immediately report the sighting to the NRC.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



5.2 Eradication Animals

Eradication animals are pests that are present in low numbers or have a limited distribution within the Northland region, and have the potential to have serious negative impacts on the community or the environment. The intention is to remove these pests from the region, and eliminate the possibility of any further reproduction within the region.

FERAL DEER

(All Cervus and Odocoileus species and hybrids)

Feral deer are not widespread or numerous in the Northland region. There are currently four species present. Red and sika deer are more common than fallow deer and wapiti. The areas where deer have been found are where they have been released or have escaped from adjacent farms. The remaining sika deer population is in the Russell Forest and surrounding private bush.

Deer are considered feral wherever they are not:

- a. Held behind fencing that meets the requirements of the Deer Farming Regulations; and
- b. Identified as required by those Regulations.

Deer are selective browsers, and target particular forest species over others. This can result in significant changes to the forest and has effects on fauna that rely on these plants. Deer can destroy the understorey of native forest by over browsing, grazing, bark stripping and trampling, which in turn may increase soil erosion. Feral deer can reduce production by damaging crops and exotic forests. They have also been implicated in the transmission of bovine tuberculosis (Tb).

Deer, including those that are farmed, are deemed to be wild animals under the Wild Animal Control Act 1977. The Minister (Department) of Conservation administers the Act. The Act prohibits deer farming in specified areas of the region, which are adjacent to significant native forests. In other parts of the region, the Department of Conservation must be notified of the farm, and specific fencing requirements must be met.

Objectives (Five Year)

- To eradicate feral deer from Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of feral deer and encourage reports of sightings.

Pest Management Methods

Response:

- Feral deer are eradicated under the Northland Wild Deer Eradication programme.
- Control is undertaken by the contract deer control team managed by the DOC.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification of animal pests to assist in surveillance.
- NRC will provide advice and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about animal pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.



Rules

1. No person shall keep deer on a property unless they are branded or marked with clearly visible identification.
2. No person shall transport any deer within or into Northland unless all rules of the National Tb Strategy are complied with.
3. No person shall liberate, release or allow to escape from captivity any deer held on any property and shall report any escapes to the NRC within 24 hours. (Reiterates in part, section II Wild Animal Control Act 1977).
4. Every person who keeps deer shall ensure that the land is fenced to a standard which effectively contains the deer and prevents their escape. (A similar provision relating to fencing to contain deer is included in sections 12, 12A, and 12B of the Wild Animal Control Act).
5. The owner of any escaped deer has 7 days to recover the animal. If escaped deer are not recovered within 7 days of their escape, the NRC, DOC or their contractors, may capture and/or destroy any deer found not contained by fencing and may recover the cost of such work from the owners of the animals, or the person(s) responsible for their release. (Parallel powers of Director-General of Conservation pursuant to section 12c Wild Animal Control Act 1977).

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

5.3 Containment Animals

Containment animals are generally those pests that are established in the region but are not widespread. These animal pests are present in the region at numbers and distributions that mean eradication is not possible or cost effective. The intention is to prevent the spread of these species beyond a defined containment area.

Objectives, Methods and Rules for Containment Animals

The objectives, methods and rules for the containment animal pests apply to all species in this category, except kauri dieback (*Phytophthora taxon Agathis*).

Objectives (Five Year)

- To contain, and where practicable reduce or eradicate populations of the containment animals in Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of the containment animals.

Pest Management Methods

NRC Response:

- NRC will respond to reports of new populations of the containment animals and attempt control programmes, where feasible.

Site-led Programmes:

- NRC will assist communities and stakeholders to control the containment animals where they impact upon local values.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification and control of animal pests.
- NRC will provide advice and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about animal pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Rules

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any live containment animal within the Northland region.
2. No person shall knowingly distribute, transport or release any live containment animal within or into the Northland region.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

KOI CARP

(Cyprinus carpio)

Koi carp are not common in Northland, and are not known to be present in any of the region's high value waterways. Koi carp in New Zealand are often a calico pattern of black, red, orange gold and white blotches. They have two pairs of barbels around the mouth. Koi carp eat insects, spawn, juvenile fish of other species and a wide range of plants. They prefer still waters in lakes, or backwaters in rivers, and are very tolerant of poor water quality.

When feeding, koi carp suck up and expel material from the bottom, filtering out edible material. They can greatly increase the turbidity of the water because they are constantly stirring up and dislodging the substrate. This makes waterways unattractive, reduces the abundance of aquatic plants, and can make the water unsuitable for swimming or drinking even by livestock.



DOC

PERCH

(Perca fluviatilis)

Perch were widely released in New Zealand in the late 1870s, but there has been little interest in their angling potential. Perch are not common in Northland. Most perch in New Zealand weigh between 1-2kg. They have two dorsal fins, the first with 13-17 firm sharp spines, and they also have a broad flat spine on the gill cover. Perch have six or more dark bands along their sides, which are most obvious in small fish. The bottom edge of the fins is bright red-orange. Perch prefer slow-flowing and still water habitats. They are strictly carnivorous and eat insect larvae and other fish.

Perch prey on zooplankton, macroinvertebrates and fish, and have the potential to significantly alter native freshwater communities, through predation and competition with native fish species.



Piet Spanns

TENCH

(Tinca tinca)

Tench were first introduced to New Zealand in 1867 as a sport fish. Tench are not common or widespread in Northland, but are known to have been introduced to at least two lakes in the region. Tench grow to a large size in New Zealand, and fish over 2kg in weight are not uncommon. Tench are usually olive green in colour, varying from dark to light. There is a single small barbel at each corner of the mouth. The fins tend to be thick and fleshy and the body is covered in small scales. Their eyes are bright orange. Tench generally live in still or slow-flowing waters.

Tench feed on insect larvae, crustaceans and molluscs, and have the potential to significantly alter native freshwater communities, through predation and competition with native fish species.



Steffen Ziemer, U.S. Geological Survey

KAURI DIEBACK

(Phytophthora taxon Agathis)

Also known as: PTA

Kauri dieback is a microscopic 'fungus-like' disease (pathogen) that only affects kauri and can kill them. Kauri dieback is a soil-borne species and spreads by soil and water movement, plant-to-plant transmission through underground root-to-root contact, people and animals. It can cause yellowing foliage, leaf loss, canopy thinning, dead branches and even death of the tree. Affected trees can develop lesions that bleed resin, extend to the major roots and sometimes girdle the trunk as a 'collar rot'.

Kauri dieback has been isolated from soil in Northland, Rodney District and North Shore City and has also been identified in the Waitakere Ranges and Great Barrier Island.

Objectives (Five Year)

- To minimise the effects of kauri dieback on environmental and economic values in Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of kauri dieback.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other agencies such as DOC, and Regional Councils, with a particular focus on pathways, vectors and areas of significance.
- Reported sightings will be investigated and response implemented.

NRC Response:

- The NRC is part of a joint agency response team aimed at slowing the spread of kauri dieback and developing control tools.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification of animal pests to assist in surveillance.
- NRC will provide advice and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about kauri dieback.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.



ARC

Rules

1. No person shall knowingly transport, distribute, sell or offer for sale any material or equipment which may contain or harbour kauri dieback without first undertaking suitable control measures to eliminate kauri dieback.
2. Where a property, through activities undertaken on the property, is identified as a portal for the active distribution of kauri dieback a management programme to control or contain the infestation is required, to be implemented by the land occupier.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

5.4 Suppression Animals

Suppression animals are animal pests that are widespread in suitable habitat throughout the region. The intention is to reduce pest densities so that impacts on the community and the environment are decreased.

Objectives and Methods for Suppression Animals

The objectives and methods for the suppression animal pests apply to all species in this category.

Objectives (Five Year)

- To minimise the effects of the suppression animals on environmental and economic values in Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of the suppression animals.

Pest Management Methods

The following pest management methods apply to the suppression animals as outlined in Table 5.

Site-led Programmes:

- NRC will assist communities and stakeholders to control the suppression animals where they impact upon local values.

NRC Customer Service:

- NRC will provide pest control products to customers on a non profit basis, to assist with animal pest control.

Education:

- NRC will provide training to relevant NRC staff and stakeholders in the identification and control of animal pests.
- NRC will provide advice and attend community meetings and field days.
- NRC will run publicity campaigns to educate the wider public about animal pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Biological Control:

- NRC will support the use of biological control agents where the criteria for control and use of the biological control agent are met.

Table 5: Pest management methods for suppression animals.

Pest	Site-led Programmes	NRC Customer Service	Education	Research	Biological Control
Argentine and Darwin's ant	•		•	•	
Brown bullhead catfish	•		•	•	
Cat – feral and stray	•		•	•	
Feral goat	•		•	•	
Feral pig	•		•	•	
Gambusia			•	•	
Guava moth	•		•	•	•
Hare	•		•	•	
Hedgehog	•		•	•	
Magpie			•	•	
Mustelids – ferret, stoat and weasel	•	•	•	•	
Myna	•		•	•	
Possum	•	•	•	•	
Rabbit	•	•	•	•	•
Rodents – Norway rat, ship rat and mouse	•	•	•	•	
Rudd	•		•	•	
Tropical grass webworm			•	•	•
Wasps			•	•	

ANTS

Argentine ant (*Linepithema humile*) and Darwin's ant (*Doleromyrma darwiniana*)

Argentine ants are generally present in or near sites of human habitation, throughout Northland. Darwin's ant, to date, has only been recorded in Whāngārei. Worker ants of both species are light to dark honey-brown, and 2-3mm long (most other common household ants in New Zealand are black). Although these species look very similar Darwin's ant can be distinguished from Argentine ant by its pungent smell when squashed. Darwin's ant is closely related to Argentine ant and has very similar behaviours and characteristics.

Both ants are domestic nuisance species invading houses, swarming over foodstuffs and infesting gardens. They can both become a serious problem with stored food products, invading food processing plants and becoming important pests of the hospitality industry. The ants can incur significant economic costs in the horticultural and agricultural sectors, impacting orchards and gardens. Argentine ants compete very effectively with all other ant species, both by fighting and by monopolising all available food sources. Where large infestations occur, Argentine ants eliminate all other ant species. They also impact other native invertebrate species, through predation and competition.

Rules

1. No person shall knowingly transport, distribute, sell or offer for sale any material or equipment that may contain or harbour Argentine ant or Darwin's ant without first undertaking suitable control measures to eliminate these ants.



Andrew Townsend

Argentine ant

2. Where a property, through activities undertaken on the property, is identified as a portal for the active distribution of ants a management programme to control or contain the infestation is required, to be implemented by the land occupier.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

BROWN BULLHEAD CATFISH

(Ameiurus nebulosus)

Brown bullhead catfish are widespread throughout Northland, but are not known to be present in any of the region's high value waterways. Brown bullhead catfish are a dark brown to olive green colour with paler sides and bellies. They have eight distinctive barbels around the mouth, small eyes and smooth skin. The leading edge on their dorsal and pectoral fins has a sharp toxic spine. Catfish are an extremely robust fish and can survive for very long periods out of water. They commonly grow to 200-300mm in length.

Catfish are carnivorous and waggle their sensitive barbels along the substrate to locate insects, crustaceans, molluscs and small fish. They also compete for food with other native species, including freshwater crayfish. Catfish stir up mud which reduces water quality for other animals and plants.

Rules

The Fisheries Act and various regulations promulgated under that Act are also applicable with respect to brown bullhead catfish.

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any live brown bullhead catfish within the Northland region.
2. No person shall knowingly distribute, transport or release any live brown bullhead catfish within or into the Northland region.

CATS

Feral and Stray (*Felis catus*)

Feral and stray cats are widely distributed throughout New Zealand. They live in most terrestrial habitats including sand dunes, pasture, tussock, scrub, exotic plantations and native forest. Feral cats are defined as cats that have none of their needs provided by humans, and their population size fluctuates largely independently of humans. Feral cats do not generally live around centres of human habitation. The feral cat population is self-sustaining and requires no input from the domestic cat population.

Stray cats are defined as cats which have been lost or abandoned by humans and have many of their needs indirectly supplied by humans, and live around centres of human habitation.

It is estimated that feral, stray and pet cats kill up to 100 million birds in New Zealand each year. Cats can also eat eggs, lizards, insects and frogs. Feral cats can carry Tb with the potential to infect cattle. Cats that are not given regular preventative treatments can pose a public health risk through the spread of zoonotic diseases (e.g. toxocarasis or toxoplasmosis).



Michael Kest

3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.
4. Rules 1 and 2 do not apply when a person is authorised to do so under the Conservation Act 1987, the Freshwater Fisheries Regulations 1983 or any regulation promulgated under the Fisheries Act 1996.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



Rules

1. No person shall liberate, release or dump any cat in Northland.
2. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

FERAL GOAT

(Capra hircus)

Under the Wild Animal Control Act 1977, any goat that is not suitably identified and effectively contained is a “wild” goat. Feral goats vary in size and colour. Adult male goats stand 76-91cm at the shoulder, with a body length of 116-152cm. Feral goats weigh between 54-68kgs and have a ‘blocky’ appearance, with stout strong legs designed for climbing. Females look similar to males but are considerably smaller.

Goats destroy the understorey of vegetation and, when combined with possum damage to the upper canopy, severe deterioration of native forest occurs. Pest plant invasion can occur under these circumstances. Goats also damage vegetation planted on land retired for soil conservation purposes and newly planted or young trees in exotic forests. Goats are one of the most destructive animals found in forests.

Feral goats are widespread throughout Northland. Populations are generally dense in areas of exotic and indigenous forest vegetation, as well as in areas of poor pasture/scrub land.

Rules

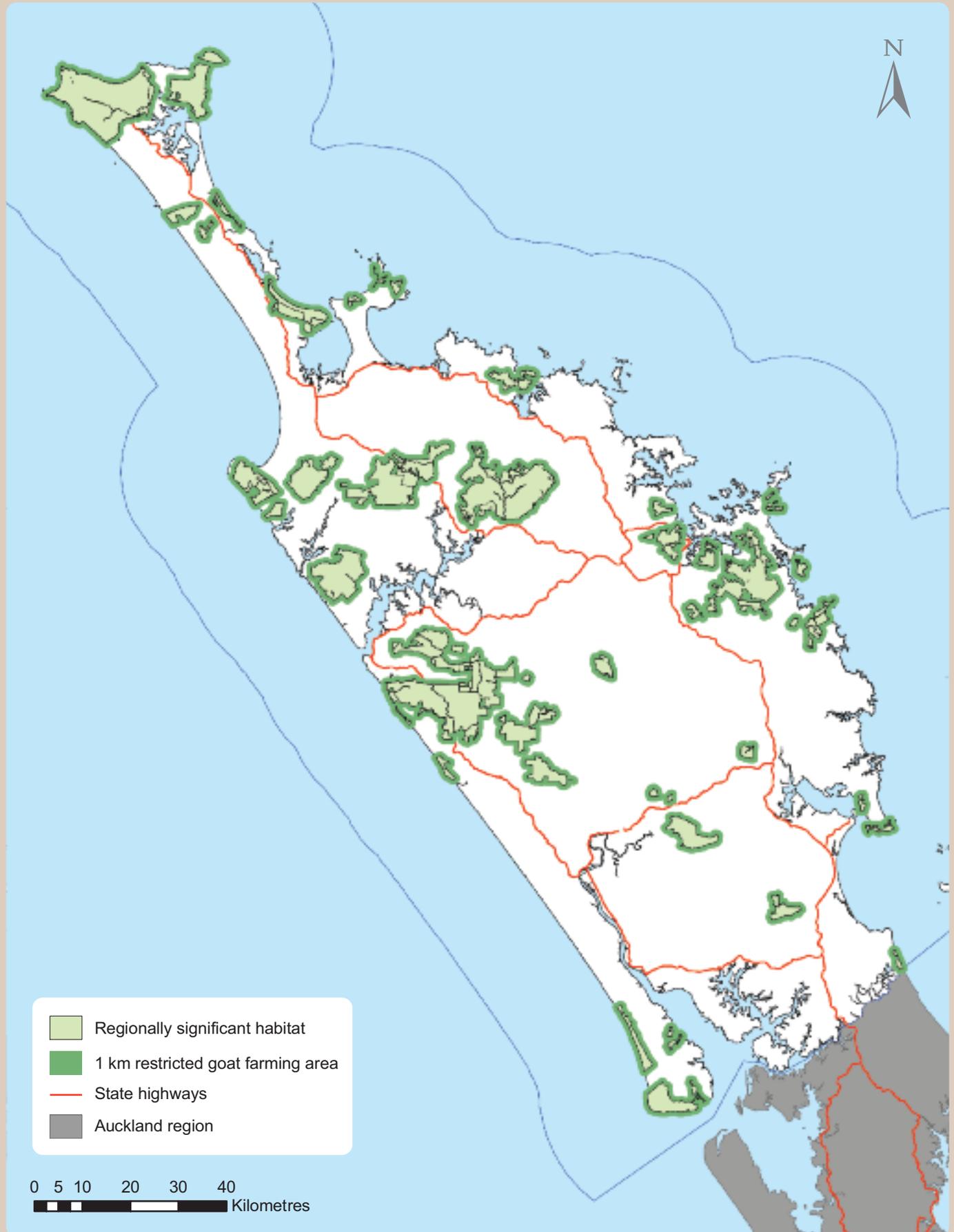
1. No person shall keep goats on a property unless they are branded or marked with clearly visible identification.
2. No person shall liberate, release or allow to escape from captivity any goats held on any property and shall report any escapes to the Regional Council within 24 hours. (Reiterates in part, section II Wild Animal Control Act 1977).
3. No person shall keep in captivity or farm goats within one kilometre of the boundaries of areas of regionally significant indigenous habitat identified on maps held by the NRC (Figure 8) except with, and subject to the conditions stated in, a consent issued by the NRC.
4. Every person who keeps goats shall ensure that the land is fenced to a standard that effectively contains the goats and prevents their escape. (A similar provision relating to fencing to contain goats is included in sections 12, 12A, and 12B of the Wild Animal Control Act).



5. The owner of any escaped goat has seven days to recover the animal. If escaped goats are not recovered within seven days of their escape, the NRC, Department of Conservation or their contractors, may capture and/or destroy any goat found not contained by fencing and may recover the cost of such work from the owners of the animals, or the person(s) responsible for their release. (Parallels powers of Director-General of Conservation pursuant to section 12c Wild Animal Control Act 1977).
6. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

Figure 8: Restricted goat farming areas.



FERAL PIG

(Sus scrofa)

Feral pigs occur in both native forest and in exotic plantations, and are well established throughout New Zealand. Feral pigs are considered by pig hunters to be a recreational resource, and there have been many releases of pigs into forested areas. There is low public awareness of the potential impacts feral pigs have on the ecology of forest areas in the region.

Feral pigs are widespread throughout Northland, and are common in some areas. Feral pigs eat grass and crops and cause damage through uprooting. They also destroy forests by uprooting trees and saplings and eating native plants. Feral pigs eat native animals and are particularly damaging to native insect numbers. They are known to be carriers of bovine Tb and leptospirosis and could spread these diseases around the region.

Rules

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any live feral pig within the Northland region.
2. No person shall knowingly distribute, transport or release any live feral pig within or into the Northland region.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



GAMBUSIA

(Gambusia affinis)

Also known as: mosquito fish

Gambusia have been introduced into many countries due to the misconception that they could help control mosquitoes by eating the larvae. Gambusia have darker margins to their scales giving them a crosshatch pattern. They have rounded caudal fins and a single, high, rounded dorsal fin. They are small fish, females may reach 60mm in length, but males are usually less than 40mm.

Gambusia are widespread throughout Northland, and are common in some areas. Gambusia populations quickly expand to outnumber other species. They are very aggressive and attack some native species by nipping at their fins and eyes and preying on their eggs. Whitebait and mudfish species are especially vulnerable to gambusia as they inhabit similar habitats.

Rules

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any live gambusia within the Northland region.
2. No person shall knowingly distribute, transport or release any gambusia within or into the Northland region.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



DOC

GUAVA MOTH

(Coscinoptycha improbana)

Guava moth is a small, black and white speckled inconspicuous moth with a 15mm wingspan. It lays its eggs at the ends of fruit and the caterpillar (larva) hatches out and burrows into the fruit. The larva feeds within the ripening fruit producing frass (excrement) and encouraging the growth of fungus. Guava moth infests fruit all year round. Its hosts include yellow guava and feijoa in autumn, citrus (lemon, mandarin, orange, grapefruit) throughout winter/spring, loquats in spring, plums and peaches, nashi pear in summer, and macadamia nuts from summer through early winter.

Guava moth is originally from Australia, but is only regarded as a minor pest there. Since establishing in Northland it has become a pest on some crops in the region, causing damage to fruit crops.

Rules

1. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

HARE

(Lepus europaeus occidentalis)

Hares are easily distinguished from rabbits. They are much larger, with long black tipped ears and large muscular hindquarters. Hares are mostly brown in colour, with a lighter brown belly. The tail is black on top with a white underside. The front legs are about half the size of the hind legs and appear undeveloped in comparison. Hares tend to be solitary animals and live above ground, whereas rabbits live in large groups and usually nest underground.

Hares are widespread throughout Northland at varying levels of infestation. Hares cause damage to new tree plantings and horticultural crops, amenity plantings and shelterbelts by eating tree bark and young shoots. Even a single hare can cause damage to newly planted shelterbelts, young trees, cuttings, crops and plant nurseries.

Rules

1. No person shall distribute, sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale, any live hare within the Northland region.
2. No person shall knowingly distribute, transport or release any live hare within or into the Northland region.



HortResearch



3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

HEDGEHOG

(Erinaceus europaeus occidentalis)

Hedgehogs eat mainly insects, but their diet is varied and includes fruit, grass, roots, and leaves. They also prey on mice, birds, lizards, frogs and the chicks and eggs of ground nesting birds. Hedgehogs live in a range of habitats, including pasture, sand dunes, near waterways, and urban areas. The main factors that can limit their distribution are dry nesting sites, food and cool temperatures.

Hedgehogs are widespread throughout Northland, and are common in some areas. In high numbers, hedgehogs can be a threat to native invertebrates, lizards and ground nesting birds. They also impact on shorebird breeding success, and compete with kiwi for food and nesting sites.

Rules

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any hedgehog within the Northland region.
2. No person shall knowingly distribute, transport or release any hedgehog within or into the Northland region.



Tony Wills

3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

MAGPIE

(Gymnorhina tibicen)

Magpies are about 36-44cm in length and weigh 280-340g. They are mainly black with a broad white collar from the shoulder to inner wing. Both sexes look similar. Magpies are widespread across the Northland region, but tend to be more noticeable near urban and intensively farmed areas. They live on bush edges, open land, gardens, orchards and urban areas. They are often seen along road edges feeding on insects killed by vehicles. They are also found in city parks and playfields, and on the edges of both native and exotic forests. They are gregarious and found in family groups of two to 24 birds.

Magpies are widespread throughout Northland, and are common in some areas. Magpies are extremely territorial birds and will show aggression to anything that may pose a threat to their territory.

Rules

There are no rules for magpies in this Strategy.



MUSTELIDS

Ferret (*Mustela furo*), Stoat (*Mustela erminea*) and Weasel (*Mustela nivalis*)

Ferrets, stoats and weasels belong to a group of animals known as mustelids. The ferret is the largest of the three species and is about 48-56cm long. Their colours vary but they are usually dark brown and blackish all over, with a creamy under-fur. The face is pale with a dark mask over the eyes. Adult males are generally larger than the females.

Mustelids are widespread throughout Northland. They can be devastating to native bird life and other fauna. Native bird species, lizards, frogs and large native insects (e.g. weta) are particularly susceptible to mustelid attack. Ferrets are carriers of bovine Tb. They also carry parasites and toxoplasmosis that can cause abortions in sheep and illness in humans.

Ferrets are unwanted organisms under the Biosecurity Act 1993. Following the enactment of the Biosecurity Amendment Bill 2001, it is now illegal to farm and/or sell ferrets in New Zealand without an exemption from a Central Government Chief Technical Officer. However, people who currently have pet ferrets are allowed to keep them until the ferrets die naturally.

Rules

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any mustelids within the Northland region.

MYNA

(*Acridotheres tristis*)

Mynas are similar in size to starlings. They have a reddish brown neck, with a darker almost black head and breast. The skin around the yellow eyes is bare and the bill and sturdy legs are also yellow. Mynas are widespread across the Northland region, but tend to be more noticeable near urban and intensively farmed areas. They live on bush edges, open land, gardens, orchards and urban areas. They are often seen along road edges feeding on insects killed by vehicles. They are also found in city parks and playfields, and on the edges of both native and exotic forests.

Mynas are widespread throughout Northland, and are common in many areas. Mynas are territorial but show aggression only to other birds within their territory. They are also known to evict other birds from their nests. Mynas also damage both soft fruit and grain crops.

Rules

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any live myna within the Northland region.
2. No person shall knowingly distribute, transport or release any live mynas within or into the Northland region.



Steve Hillebrand, USFWS

Stoat

2. No person shall knowingly distribute, transport or release any mustelids within or into the Northland region.
3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



Guillaume Blanchard

3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

POSSUM

(Trichosurus vulpecula)

Possoms are marsupial animals of medium to stout build. They have a body length of 38-45cm and an average weight of 2-3kg. The head is small with oval ears. The muzzle is blunt and the nose is pinkish with a black band along it. There are two main colour types found, grey and black. Possoms have large eyes and catlike whiskers, which are characteristic of nocturnal animals. The average life span of a possum is 7 to 10 years.

Possoms are found throughout the region, although their density varies from area to area. They are one of the most destructive animals in a forest environment. Their browsing damages and destroys forests, and affects pasture, vegetable and horticultural crops. Possoms can be a vector in the spread of diseases affecting domestic animals and humans including bovine Tb.

Rules

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any possums within the Northland region.
2. No person shall knowingly distribute, transport or release any possum, whether dead or alive, into the Northland region.
3. No person shall keep a possum in captivity, including as a pet, unless the premises in which the possum is held are licensed by DOC under the Wild Animal Control Act 1977. (Sec12, W.A.C Act 1977)

RABBIT

(Oryctolagus cuniculus)

Rabbits are mainly buff coloured, with a reddish neck, white under parts and black fur on the upper side of the tail with white below. There is a wide variation in the colour of body fur from white to a light sandy colour to black. Rabbits are widespread throughout Northland at varying levels of infestation. Soil type and land management have a significant influence on population levels, with the greatest densities on hard-grazed lighter and drier sandy and volcanic soils.

Rabbits compete directly with stock for grazing and can sour pasture by eating out the most palatable species of grass. When in very high numbers their burrowing can cause erosion on lighter soils. They eat new plantings of trees and crops, causing losses to varying degrees in forestry, horticulture, shelterbelt and amenity plantings. They are also a nuisance in residential gardens and damage golf courses and other turfed recreational areas.

The following domestic varieties, when in proper confinement, are excluded from the strategy: New Zealand white, angora, Flemish giant, rex, chinchilla, Californian, Netherland dwarf, Dutch, tan, and silver fox.

Rules

1. No person shall liberate or release any rabbits in Northland.



4. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



2. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

RODENTS

Norway Rat (*Rattus norvegicus*),
Ship Rat (*Rattus rattus*) and
Mouse (*Mus musculus*)

Rodents are widespread throughout Northland. The ship rat is the smaller of the two European species found in New Zealand but has a larger and thicker tail. The coat of the Norway rat is grey-brown and shaggy with a pale underside. Rats are mainly nocturnal, and eat seeds, bird eggs, nestlings, invertebrates, native snails, frogs, and lizards. Since their arrival in New Zealand, rats have had a significant impact on native flora and fauna and have been implicated in the decline of many native species. They also eat and contaminate grain and food stores and some nut crops.

Mice are prolific breeders, reaching sexual maturity at five weeks, and having 5 to 10 litters of 5 to 6 young per year. Mice compete with native species for food sources and also prey on native insects (such as weta), lizards, eggs, bird chicks and other fauna.

Rules

1. No person shall liberate or release any rodent in Northland.

RUDD

(*Scardinius erythrophthalmus*)

Rudd were illegally imported into New Zealand in 1967 and widely released into freshwater systems. They are widespread throughout Northland. Rudd are darker on their backs than on their bellies and have bronze highlights when the light catches their scales. Their fins are usually bright reddish orange. They do not have any barbels around their mouth, a feature that tells them apart from koi carp. Rudd are usually 200-250mm long.

Juvenile rudd are carnivorous, but as adults their diet consists mainly of aquatic plants. A high-density rudd population could impact on native fish and plant communities, particularly where plant communities are limited. Rudd are prolific breeders and large females can produce literally hundreds of thousands of eggs.

Rules

1. No person shall sell, offer for sale, breed, multiply or hold in a premises where animals are offered for sale any live rudd within the Northland region.
2. No person shall knowingly distribute, transport or release any live rudd within or into the Northland region.



DOC

Ship rat

2. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.



U.S. Geological Survey

3. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

TROPICAL GRASS WEBWORM

(Herpetogramma licarsisalis)

Tropical grass webworm caterpillars are 5-20mm long and very active when disturbed. They are translucent, and range from pale green to dark brown depending on their food. They live in pasture, feeding mainly at night or on cloudy days. By day, the caterpillars shelter in silk tunnels that they spin in the grass. They prefer kikuyu, but eat other grasses and crops as well as some weed species. Adults are drab fawn coloured moths, sometimes with dark spots scattered over the 10-15mm wide delta shaped wings. The adult or moth stage does not feed.

Webworm caterpillars are most numerous and hungry over late summer and autumn, and can cause serious pasture damage. Apparently hard grazed patches quickly spread out. They can completely strip grass of green tissue, often leaving only peeled white fibrous stalks. The larval, or caterpillar stage does the pasture damage. Tropical grass webworm is widespread in the Far North and localised population explosions occur in periods of extended warm moist conditions.

Rules

There are no rules for tropical grass webworm in this RPMS.



WASPS

German Wasp (*Vespula germanica*) and **Common Wasp** (*Vespula vulgaris*)

German wasps are 12-17mm long with a blackish brown abdomen and bright yellow stripes. They look similar to common wasps and have strong black markings including an arrow-shaped mark down the middle of the abdomen with black spots on either side. German wasps usually nest underground in holes dug in the soil, or in the crevices of tree trunks, stacked materials, compost or hedges. In urban areas, German wasps often nest in walls, roof spaces or other convenient gaps in buildings.

Common wasps are very similar in appearance to German wasps. Members of the colony cooperate in the care of the young, and the building and protection of the nest. Females are easily identified by a black mark behind the eye on the side of the head, yellow bands on the "shoulders" and black dots and rings on the abdomen. Common wasps are found in most habitats.

Wasps are widespread throughout Northland, and are common in some areas. Wasps inflict painful toxic stings on people and animals. Wasps usually attack and sting if their nests are disturbed or they are provoked. Wasps compete for sugar resources with nectar feeding birds and insects. Wasps are major predators of invertebrates and they may compete for invertebrate prey with insectivorous birds and other predacious invertebrates.



Richard Baritz

German wasp

Rules

There are no rules for wasps in this RPMS.

5.5 Risk Assessment Animals

Risk assessment animal pests (Table 6) are species which are of potential concern to the region, but little is known about the distribution or the risks posed. Further information about the ecological requirements and population behaviour of these species is needed. The intention is to improve understanding about these pests in the region so they can be classified and managed appropriately when the Strategy is reviewed.

Table 6: Risk assessment animals.

Common Name	Scientific Name	Common Name	Scientific Name
Bearded dragon	<i>Amphibolurus barbatus</i>	Red-eared slider turtle	<i>Trachemys scripta elegans</i>
Blue-tongued skink	<i>Tiliqua scincoides and Tiliqua nigrolutea</i>	Shingleback lizard	<i>Trachydosaurus rugosus</i>
Caudo	<i>Phallocerus caudimaculatus</i>	Snake-neck turtle	<i>Chelodina longicollis</i>
Eastern water dragon	<i>Physignathus lesueurii lesueurii</i>	Sulphur crested cockatoo	<i>Cacatua galerita</i>
Rainbow skink	<i>Lampropholis delicata</i>		

While the extent of potential impacts is unknown, these species may have the ability to alter native ecosystems and compete with native species for food and space. Exotic reptiles are sold as pets and could potentially impact native ecology. They may carry parasites and diseases, posing a risk to native lizard populations. Predation on eggs and chicks of native birds and other lizards is possible, as is competition with native species for food and habitat.

Objectives (Five Year)

- To assess the risks, impacts and options for managing the risk assessment animals.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of animal pests and encourage reports of sightings.

Pest Management Methods

- The NRC will undertake surveillance, research and raise public awareness of risk assessment pests to assist with classifying these pests and managing them appropriately.
- The NRC will provide advice and information to the public, and will support initiatives to minimise any adverse impacts they have.
- If surveillance indicates that a risk assessment pest poses a threat to the region, and eradication is achievable, control may be carried out by the NRC and their contractors or, with agreement, by other agencies.

Rules

1. No person shall knowingly release any risk assessment pest within or into the Northland region.
2. Where a management agency has undertaken initial control work on a property and/or supplied resources to reduce pest animal population densities to a level agreed to in a management plan for the area, the occupier of the property shall maintain pest animal population densities to those agreed to in the management plan.
3. Every person who suspects the presence of any uncontained risk assessment pest shall immediately report the sighting to the NRC.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

6. MARINE PEST MANAGEMENT STRATEGY

The organisms listed in Table 7 are declared to be pests under the Biosecurity Act, throughout the Northland region. The reason for declaration as a pest, management objectives, rules and obligations for occupiers are defined for each pest in the following sections.

Table 7: Marine pests.

Common Name	Scientific Name	Pest Classification	Page
Asian clam	<i>Potamocorbula amurensis</i>	Exclusion	68
Caulerpa seaweed	<i>Caulerpa taxifolia</i>	Exclusion	68
Chinese mitten crab	<i>Eriocheir sinensis</i>	Exclusion	68
European shore crab	<i>Carcinus maenas</i>	Exclusion	69
Mediterranean fanworm	<i>Sabella spallanzanii</i>	Exclusion	69
Northern pacific seastar	<i>Asterias amurensis</i>	Exclusion	69
Asian paddle crab	<i>Charybdis japonica</i>	Suppression	71
Didemnum sea squirt	<i>Didemnum vexillum</i>	Suppression	71
Eudistoma sea squirt	<i>Eudistoma elongatum</i>	Suppression	72
Styela sea squirt	<i>Styela clava</i>	Suppression	72
Japanese kelp	<i>Undaria pinnatifida</i>	Suppression	72
Risk assessment pests		Risk Assessment	74

The organisms listed in Table 8 are only deemed to be pests under the Biosecurity Act, where they are subject to a NRC approved management plan for a specific pest control area.

Table 8: Species deemed as pests in CPCAs.

Common Name	Scientific Name	Pest Classification	Page
Asian date mussel	<i>Musculista senhousia</i>	Suppression (CPCA)	73
Australian tubeworm	<i>Ficopomatus enigmaticus</i>	Suppression (CPCA)	73
File shell	<i>Limaria orientalis</i>	Suppression (CPCA)	73
Pacific oyster	<i>Crassostrea gigas</i>	Suppression (CPCA)	73

6.1 Exclusion Marine Pests

Exclusion marine pests are potential pests which are not known to have established in Northland. Many of them are also not currently known to be present in New Zealand. These marine pests all have the potential to establish in the region, and are capable of causing significant adverse effects. They are listed as unwanted organisms under the Biosecurity Act. The intention of the Strategy is to prevent these pests from entering and establishing within Northland over the life of the Strategy.

Objectives, Methods and Rules for Exclusion Marine Pests

The objectives, methods and rules for the exclusion marine pests are generic for all species in this category.

Objectives (Five Year)

- To prevent the exclusion marine pests from becoming established in Northland.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of the exclusion marine pests and encourage reports of sightings.

Pest Management Methods

Surveillance:

- NRC will develop and implement a regional surveillance plan in conjunction with MAFBNZ, stakeholders, and other Crown agencies such as DOC, and the Ministry of Fisheries, with a particular focus on pathways, vectors and areas of significance.
- Reported sightings will be investigated and a response implemented.

Incursion Response:

- Eradication of incursions of the exclusion marine pests may be attempted in conjunction with relevant Crown agencies and stakeholders where practicable. Any NRC response would be funded via section 100 of the Biosecurity Act as approved by NRC resolution.

Education:

- NRC will provide training to relevant NRC/stakeholder staff in the identification of marine pests to assist in surveillance.
- NRC will provide advice to NRC consents staff, marine stakeholders/interested parties/occupiers on practices which limit the establishment of marine pests.
- NRC will run publicity campaigns to educate the wider public about marine pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Rules

The exclusion marine pests are unwanted and notifiable organisms under the Biosecurity Act. As such the following rules apply under sections 46, 52 and 53 of the Biosecurity Act:

1. No person shall sell, offer for sale, breed or multiply any exclusion marine pest.
2. No person shall knowingly transport or release any exclusion marine pest.
3. Every person who sees any exclusion marine pest, or suspects the presence of any exclusion marine pest shall immediately report the sighting to the NRC or MAFBNZ.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

ASIAN CLAM

(Potamocorbula amurensis)

Asian clam is not known to be in New Zealand. It is a shellfish with a distinctive uneven overbite and is found in estuaries and brackish waters. The shell is 2-3cm across and is a dirty white, yellow or tan colour. Asian clam can live in fresh and salt water and forms dense mats displacing native species and changing seafloor/riverbed conditions. It consumes large amounts of phyto and zooplankton, so can substantially change any marine community. Asian clam can proliferate rapidly and reach extremely high densities, dominating benthic habitat.

It is native to Japan, Korea and China, though has now invaded parts of the west coast of the United States. Young clams can be caught up in ships' ballast water while adults can attach to fishing equipment. Asian clam is thought to be responsible for the collapse of some commercial fisheries in



California Fish and Game

addition to the decline in the diversity and abundance of many benthic species in California.

CAULERPA SEAWEED

(Caulerpa taxifolia)

Caulerpa taxifolia is not known to be in New Zealand, although there are native species that look similar. The aquarium strain of caulerpa is a rapidly growing saltwater weed that can cause major ecological and economic damage. This strain is particularly invasive, and can grow in a wide range of water temperatures, depths and substrates including rock, mud and sand. It is a bright green seaweed with feather-like fronds and has long horizontal runners (up to 9m) supporting many upright fronds. Fronds are flattened-looking with a smooth and distinct midrib.

Caulerpa can form dense fields that can prevent the establishment of native seaweeds and exclude indigenous marine life. It can cause the reduction of fishing catches due to the elimination of fish habitat. The most likely way of Caulerpa arriving into New Zealand is through importation



for use in aquariums and subsequent release into the marine environment.

CHINESE MITTEN CRAB

(Eriocheir sinensis)

Chinese mitten crab is light brown with a body width up to 8cm. Adults have dense patches of hairs on the claws. It has a round body shape and a distinctive notch between the eyes. Its legs are twice as long as its body width. Post-larval stages settle in salt water then migrate to freshwater to grow and develop. Adults migrate to the sea to reproduce and die.

Chinese mitten crab could cause significant damage through burrowing activity, which can undermine the integrity of stream banks. It is an opportunistic feeder with a wide diet and can adversely affect biodiversity (both freshwater and marine) through predation upon and competition with indigenous species. It also has the potential to affect human health as it can carry a parasitic lung fluke which can be passed to humans.

Chinese mitten crab is not known to be in New Zealand. Arrival is possible through ships' ballast water, either salt or



California Fish and Game

freshwater, water intakes or among other marine fouling on the outside of ships or yachts. The mitten crab is considered a delicacy in some parts of the world and live crabs have been imported illegally in other countries.

EUROPEAN SHORE CRAB

(Carcinus maenas)

Also known as: European green crab

European shore crab has a broad diet and can survive in a wide range of environments. The crab is medium-sized with a body width up to about 9cm. It has five distinctive spines on either side of the eyes on the front end of the body. The upper body is mottled dark brown to dark green, with small yellow patches. The underside varies in colour from green to orange or red.

It is a voracious predator and can cause the decline of other crab and bivalve species. The crab has the potential to negatively impact shellfish populations important for commercial and recreational fisheries and as a source of kaimoana.

European shore crab is not known to be in New Zealand. Arrival is possible through ships' ballast water, water intakes



CSIRO

or among other marine fouling on the outside of ships or yachts.

MEDITERRANEAN FANWORM

(Sabella spallanzanii)

The Mediterranean fanworm is a marine bristleworm that is typically found in estuaries or sheltered sites, at depths of anywhere between one to 30m. It consists of a tube, up to 40cm tall, which is always anchored to a hard surface, topped with a single spiral fan (radiole). The tube is tough and flexible and often muddy in appearance. It can often have other organisms growing on the surface.

The Mediterranean fanworm can form dense groups that could affect native species by competing for food and space. Recent studies have indicated some impact on the establishment of new generations of some species, and on nutrient flow. There is potential that dense beds could become a nuisance to recreational and commercial fishers through the clogging of dredges and fouling of other fishing gear.



G. Read, NIWA

The Mediterranean fanworm has been detected in Lyttelton and Auckland. To date, it has not been detected in Northland. Fanworms spread by growing on dirty vessels and equipment and then being relocated. They can also travel growing in enclosed wet areas on ships, or with other marine fouling organisms as larvae in ballast water.

NORTHERN PACIFIC SEASTAR

(Asterias amurensis)

Northern Pacific seastar can reach 40cm in diameter and has distinctive upturned tips to its five pointed arms. The arms join onto a central disc and are covered by numerous small spines with sharp edges. It is mainly yellow in colour and often has purple or red detail on its upper surface. This seastar is normally found in shallow water but can be found as deep as 200m. It is most likely to be found in coastal areas protected from wave action, on soft bottoms, rocks and man-made surfaces.

Northern Pacific seastar is a prolific breeder and voracious feeder preferring mussels, scallops and clams but will also prey upon a wide variety of other marine life. It can survive and breed in a wide range of habitats. It could also adversely affect biodiversity, kaimoana resources and recreational seafood harvest given its predatory behaviour and prolific breeding rate.



CSIRO

The Northern Pacific seastar is not known to be in New Zealand. Arrival is possible through ships' ballast water, water intakes or among other marine fouling on the outside of ships or yachts.

6.2 Suppression Marine Pests

Objectives, Methods and Rules for Suppression Marine Pests

The objectives, methods and rules for the suppression marine pests are generic for all species in this category.

Objectives (Five Year)

- To minimise the effects of the suppression marine pests on environmental and economic values in Northland.
- To restrict the spread of the suppression marine pests into areas where they are not currently established.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of suppression marine pests and encourage reports of sightings.

Pest Management Methods

Surveillance:

- NRC will include the suppression marine pests in a regional surveillance plan in order to identify the current range and new sites.

Response:

- Responses to the suppression marine pests will be through site-led tactics. These include:
 - **Community Pest Control Areas:** NRC will assist communities and stakeholders to control suppression marine pests where they have impacts upon local values.
 - **High Value Areas:** NRC will include the suppression marine pests in surveillance programmes and where detected at high value areas a response may be developed in conjunction with Crown agencies/stakeholders where appropriate.

Education:

- NRC will provide training to relevant NRC/stakeholder staff in the identification of marine pests to assist in surveillance.
- NRC will provide advice to NRC consents staff, marine stakeholders/interested parties/occupiers on practices which limit the establishment of marine pests.
- NRC will run publicity campaigns to educate the wider public about marine pests.

Research:

- NRC will work cooperatively with other agencies where further research is needed to identify management measures, potential impacts, pathways and/or behaviours.

Rules

1. No person shall knowingly propagate, transport or release suppression marine pests in Northland.
2. Where a management agency has undertaken initial control work and/or supplied resources to reduce pest population densities to a level agreed to in a management plan for the area, the pests shall be maintained at the agreed level by the signatories to the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

ASIAN PADDLE CRAB

(Charybdis japonica)

The Asian paddle crab is a swimming crab native to South East Asia. It is typically found in estuaries where there is firm sand or muddy fine sand. It is a relatively large crab with paddle-like hind legs. Adults have a shell width of around 12cm. The adults also have six distinct spines or spikes on each side of the eyes. The crabs range in colour from pale green through olive green, to a deep chestnut brown with purplish markings on the carapace (shell).

Adult paddle crabs can produce hundreds of thousands of offspring. The larvae can float in the water for three to four weeks, during which time they can be moved large distances by tides and currents. Adults are also capable of swimming large distances. These crabs are very aggressive and have the potential to compete with native crabs for space and food, including the commercially fished native paddle crab. These crabs can also impact upon biodiversity, aquaculture and shellfish resources through predation.



Asian Paddle Crab is in Northland. It is widespread in the Hauraki Gulf and has been detected in small numbers in Whāngārei Harbour.

DIDEMNUM SEA SQUIRT

(Didemnum vexillum)

Didemnum is a leathery or spongy textured, light mustard coloured sea squirt which often looks like a yellowish wax dripping over a structure such as a rope or mussel line. Its surface has raised leaf-like veins without pores. Colonies of didemnum can reproduce sexually by releasing tailed larvae that are carried in water currents. It can also reproduce asexually by budding, hence fragments can break off and grow into new colonies

This sea squirt readily occupies hard surfaces including ship hulls, wharf structures and floats, pilings, moorings and ropes, rock outcrops, and gravel seabed. Didemnum's smothering capabilities choke off bottom dwellers such as shellfish, and may cover grounds needed by fish to lay eggs. Didemnum is not known to be in Northland, but is becoming quite widespread on the east coast of the North Island and the top of the South Island.



A. Courts, Caithron

EUDISTOMA SEA SQUIRT

(Eudistoma elongatum)

Eudistoma is a colonial sea squirt. It forms clusters of white coloured tubes, which contain many small individual organisms. It is generally found in muddy bottomed tidal habitats and on man-made structures such as wharf piles and aquaculture equipment. It is generally submerged just below the waterline, but can often be seen at low tide. Eudistoma reduces in volume during the winter months, but once water temperatures lift it reappears in large volumes, usually over the summer.

Eudistoma is an Australian species and was first reported in New Zealand in 2005. It has been reported on several marine farms on Northland’s east coast, Houhora and Pārengarenga harbours, the Bay of Islands, and Whāngārei Harbour.



H. Blomfield

STYELA SEA SQUIRT

(Styela clava)

Styela is a large, solitary sea squirt that is native to the north-west Pacific. This sea squirt has a long, club-shaped body and each individual has its own stalk and adheres separately to a substrate. The sea squirt is usually brown in colour and underwater often appears fuzzy with secondary growth coating it. It grows attached to hard natural and artificial surfaces and is frequently transported as biofouling on vessels and other mobile marine structures.

Styela poses a threat to biodiversity values through its smothering behaviour. It can multiply rapidly in suitable sites, and competes with other filter feeders for food and space. As a result it can disrupt native ecosystems. It can also add significant maintenance costs to marine structures and vessels through its fouling behaviour. Styela is established in Northland at Marsden Cove and Ōpua marinas.



Matt Connee

UNDARIA SEAWEED

(Undaria pinnatifida)

Undaria is a highly invasive and opportunistic seaweed which spreads mainly by fouling on boat hulls. It is harvested in Japan as a food source. Mature plants (as shown) are a brown/ green/ yellow colour and grow to 1-2m. Juvenile undaria plants have a holdfast and stem and an undivided blade (they appear as a single leaf). The distinctive midrib starts becoming apparent once the plant grows over 5cm.

Undaria is not known to be in Northland, but is present in many harbours and ports around New Zealand. Undaria can form dense stands underwater which may lead to the exclusion or displacement of native plant and animal species, and can change the structure of ecosystems, especially in areas where native seaweeds are absent.



6.3 Community Pest Control Area Marine Pests

The NRC aims to assist communities and stakeholders to control pests where they impact upon local values. Species that are regionally or locally common may be considered for a CPCA or interagency site-led programme where significant environmental, economic or social benefits are likely.

In addition to the suppression pests described above, the following marine species may also be considered for inclusion in a CPCA (Table 9). These species are only deemed to be pests under the Biosecurity Act, where subject to a NRC approved management plan for a specific pest control area.

Table 9: CPCA marine pests.

Common Name	Scientific Name	Group
Asian date mussel	<i>Musculista senhousia</i>	Mollusc
Australian tubeworm	<i>Ficopomatus enigmaticus</i>	Annelid
File shell	<i>Limaria orientalis</i>	Mollusc
Pacific oyster	<i>Crassostrea gigas</i>	Mollusc

These species are widespread throughout the region, but can have adverse impacts on local values, such as recreational use of, or access to beaches and coastal waters. They also have the ability to alter native ecosystems and compete with native species for food and space where present in high numbers.

Pacific oyster is an established commercial species and is subject to Fisheries and Aquaculture Regulations. No CPCA shall be considered for Pacific oyster that contradicts these regulations or proposes to control Pacific Oyster in an Oyster Reserve, authorised marine farm or where it is valued as a food source.

Objectives (Five Year)

- To assist communities and stakeholders to manage local impacts of the CPCA marine pests.

Pest Management Methods

Site-led Programmes:

- NRC will assist communities and stakeholders to control the CPCA marine pests where they impact upon local values.

Education:

- NRC will provide advice to NRC consents staff, marine stakeholders/interested parties/occupiers on practices which limit the establishment of marine pests.

Rules

1. Where a management agency has undertaken initial control work and/or supplied resources to reduce pest population densities to a level agreed to in a management plan for the area, the pests shall be maintained at the agreed level by the signatories to the management plan.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

6.4 Risk Assessment Marine Pests

Risk assessment pests are those pests which are of potential concern to the region, but little is known about the distribution or the risks posed. The intention is to improve understanding about these pests so that the pest can be classified and managed appropriately when the Strategy is reviewed. Most of these species are not known to be in New Zealand.

There are many potential pests that could arrive here and it is difficult to predict which species will arrive and establish, and which will go on to become pests. The majority of species in the risk assessment list (Table 10) are also recommended for surveillance and monitoring in Australian waters.

Table 10: Risk assessment marine pests.

Common Name	Scientific Name	Group
Asian shore crab	<i>Hemigrapsus sanguineus</i>	Crustacean
Dead man's fingers	<i>Codium fragile ssp. tomentosoides</i>	Macroalgae
Red algae	<i>Grateloupia turuturu</i>	Macroalgae
Wireweed	<i>Sargassum muticum</i>	Macroalgae
Asian green mussel	<i>Perna viridis</i>	Mollusc
Asian rapa whelk	<i>Rapana venosa</i>	Mollusc
Brown mussel	<i>Perna perna</i>	Mollusc
Black-striped mussel	<i>Mytilopsis sallei</i>	Mollusc
European clam	<i>Varicorbula gibba</i>	Mollusc
Golden mussel	<i>Limnoperna fortunei</i>	Mollusc
Didemnum sea squirts (other than <i>D.vexillum</i>)	<i>Non-indigenous Didemnum species</i>	Sea squirt
Pyura sea squirt*	<i>Pyura stolonifera praeputialis</i>	Sea squirt

* Already in Northland and under investigation by MAFBNZ.

Objectives (Five Year)

- To assess the risks, impacts and options for managing the risk assessment marine pests.
- To raise public awareness of the economic, biodiversity, social and cultural impacts of marine pests and encourage reports of sightings.

Pest Management Methods

- The NRC will undertake surveillance, research and raise public awareness of risk assessment marine pests to assist with classifying these pests and managing them appropriately.
- The NRC will provide advice and information to the public, and will support initiatives to minimise any adverse impacts they have.
- If surveillance indicates that a risk assessment marine pest poses a threat to the region, and eradication is achievable, control may be carried out by the NRC and their contractors or, with agreement, by other agencies.

Rules

1. No person shall knowingly propagate, transport or release any risk assessment marine pest in the Northland region.
2. Where a management agency has undertaken initial control work and/or supplied resources to reduce pest population densities to a level agreed to in a management plan for the area, the pests shall be maintained at the agreed level by the signatories to the management plan.
3. Every person who suspects the presence of any risk assessment marine pest shall immediately report the sighting to the NRC or MAFBNZ.

A breach of these rules, without reasonable excuse, is an offence under Section 154(r) of the Act.

7. REGULATORY MANAGEMENT

7.1 Biosecurity Act Powers

The powers conferred on the NRC by the Biosecurity Act for the purposes of implementing the Regional Pest Management Strategies are outlined below. Authorised persons will exercise many of these powers on behalf of the Principal Officer (Chief Executive Officer) of the NRC. The Principal Officer shall appoint authorised persons and may delegate powers to any authorised person, subject to sections 103 and 105 of the Biosecurity Act. When carrying out their duties, an authorised person shall be limited to using those powers specified in their warrant of appointment, based on those powers listed:

Administrative Powers	Reference in the Biosecurity Act	Level of Delegation
Making of rules.	section 80B	NRC in Regional Pest Management Strategies.
The appointment of authorised and accredited persons. Delegation to authorised persons. Power to request a warrant to inspect a dwelling or marae.	section 103(3) and (7) section 105 section 110	Principal Officer of the NRC.
Duty to provide information. Power to require assistance. Power of inspection. Power to record information. General powers. Use of dogs and devices. Power to seize abandoned goods. Power to examine organisms. Other powers in respect of "risk goods". Power to vaccinate. Enforcement of area controls.	section 43 section 106 sections 109 and 112 section 113 section 114 section 115 section 119 section 121 section 122 section 123 section 134	An "authorised person" appointed by the Principal Officer of the NRC shall have authority to exercise such powers and functions contained within these sections, as defined in the Regional Pest Management Strategies, on the authorised persons warrant of appointment, and the NRC Deed of Delegation.

7.2 Authorised and Accredited Persons

Authorised Persons

All those persons, who may, from time to time, be so appointed by the Principal Officer of the NRC, shall be authorised persons appointed pursuant to section 103 of the Biosecurity Act and shall exercise such functions, powers and duties as are specified in their individual warrants of appointment.

Appointment of Accredited Persons

The Principal Officer of the NRC may, from time to time, appoint suitably qualified contractors or other persons as accredited persons in terms of section 103(7) of the Biosecurity Act to perform works specified in contract documents.

7.3 Offences

Any person who contravenes section 154 of the Biosecurity Act, including but not limited to, breaching any rule in the Strategies or without reasonable excuse, failing to comply with a direction or failing to comply with the Biosecurity Act, commits an offence against the Act. For the purpose of clarity, the existence of rules in the Strategies in no way limits the application of any provision of the Biosecurity Act. The NRC will, at its discretion, bring a prosecution against any person who commits an offence against the Biosecurity Act.

7.4 Exemption Provisions

Any occupier or other person may, upon representation to the NRC, seek an exemption from any provision of a rule prescribed in these Strategies. Such exemptions will be considered as follows:

- a. NRC may, if it considers it appropriate, exempt any person from any specified requirement in any rule included in these Strategies in accordance with the Biosecurity Act.
- b. Before granting an exemption under this section, the NRC must be satisfied in the circumstances of each case that:
 - i. the requirement has been substantially complied with and that further compliance is unnecessary; or
 - ii. the action taken, or provision made in respect of the matter to which the requirement relates, is as effective or more effective than actual compliance with the requirement; or
 - iii. the prescribed requirements are clearly unreasonable or inappropriate in the particular case; or
 - iv. events have occurred that make the prescribed requirements unnecessary or inappropriate in the particular case, and that the granting of the exemption will not significantly prejudice the attainment of the objectives of these Strategies.

NRC will maintain a register recording the number and nature of exemptions granted. This register will be available for public inspection during normal office hours.

7.5 Policy Enforcement

Issue of Legal Directions by Authorised Persons

An authorised person may issue a legal direction to any occupier to carry out specified works or measures for the purposes of eradicating or preventing the spread of any pest in accordance with a Pest Management Strategy. The legal direction shall be issued under section 122(a) of the Biosecurity Act and specify the following matters:

- a. The land in respect of which works or measures is required to be undertaken;
- b. The pest for which the works or measures are required;
- c. Works or measures to be undertaken to meet the occupier's obligations;
- d. The time within which the works or measures are to be undertaken;
- e. Action that may be undertaken by the management agency if the occupier or occupiers fail to comply with any part of the direction; and
- f. The name, address, telephone number and fax number of the management agency and the name of the authorised person issuing the legal direction.

Failure to Comply with a Legal Direction

Where a legal direction has been given to an occupier and the occupier has not complied with the requirements of the legal direction within the time specified, then the management agency may enter onto the land specified in the legal direction and carry out, or cause to be carried out, the works or measures specified in the legal direction, or such other works or measures as are reasonably necessary or appropriate for the purpose of giving effect to the requirements of the legal direction.

Recovery of Costs Incurred by Management Agency

Where a management agency undertakes works or measures for the purposes of giving effect to the requirements of a legal direction, it shall recover the costs incurred from the occupier pursuant to section 128 and 129 of the Biosecurity Act and may register the debt as a charge against the land.

Variation of a Legal Direction

Where, upon the representations of an occupier issued with a legal direction, an authorised person is satisfied that:

- a. Steps have been taken to comply with the direction; and/or
- b. The occupier has been prevented by reasonable cause from completing the necessary works or measures;

the authorised person may vary the requirements of the legal direction, including extending the time period specified for works or measures to be undertaken, as considered appropriate.

Cancellation of a Legal Direction

When an authorised person is satisfied that:

- a. Works or measures have been undertaken to meet the occupier's obligations; or
- b. For some other reason it is no longer appropriate to enforce the legal direction;

the authorised person may cancel that legal direction.

Modes of Service for Legal Directions

A legal direction to an occupier is to be served in the ways set out in below:

1. Where an occupier is a person (other than the Crown), or a body by:
 - a. Delivering it personally to the person; or
 - b. Delivering it (including by facsimile) at the usual, last known place of residence or business of the person; or
 - c. Sending it in a prepaid post addressed to the person at the last known place of residence or business of the person; or
 - d. Where it is not practicable to give it in accordance with sub clause (a), (b) or (c), by placing it on some conspicuous part of the land in a way that it will remain legible for a reasonable time.
2. Where the occupier is a Minister of the Crown, by giving it to the Chief Executive of the appropriate department or state owned enterprise in accordance with sub clauses (1)(a) to (1)(c).
3. Where the occupier is a body (incorporated or not) a legal direction shall be given by:
 - a. Giving it to an officer of the body in accordance with sub clauses 1(a) to (1)(c); or
 - b. Delivering it to the registered office of the body in accordance with sub clauses (1)(a) to (1)(c); or
 - c. In the case of a partnership, a legal direction shall be given to any one of the partners in accordance with sub clauses (1) (a) to (1) (c).
4. Where a legal direction is to be served on owners of Māori land, the service shall be in accordance with section 181 of the Te Ture Whenua Māori Act 1993.

In the event of a land occupier or other persons failing to comply with any rule prescribed in the Strategies, or with any provisions of the Biosecurity Act in relation to declared pests, an authorised person of the NRC will:

- a. Advise the land occupier or other person of their noncompliance;
- b. Advise they take remedial action and initiate the regulatory procedures set out in section 7; or
- c. Advise the land occupier or other person that they have committed an offence against the Biosecurity Act and initiate court proceedings.

8. RELATIONSHIP TO OTHER STRATEGIES

Integrated management aims to minimise the effects of cross-boundary issues and give effect to the objectives of these Strategies. The NRC will use the following procedures in relation to integrated management and cross-boundary issues:

- Liaison with MAFBNZ with regard to pest management issues which are best dealt with or coordinated at a national level;
- Liaison with Crown land occupiers with respect to coordination of pest management programmes;
- Liaison with the Auckland Regional Council on cross-boundary issues pertaining to pest management;
- Liaison with other Regional Councils on pest management matters which are relevant to more than one region;
- Encouraging other authorities (e.g. territorial local authorities) to adopt policies and practices which will avoid, remedy or mitigate adverse effects associated with pests, and coordinating education initiatives with other agencies; and
- Making submissions on documents prepared by other authorities.

There is an operative Regional Pest Management Strategy in the neighbouring Auckland region and national Strategies for Bovine Tb and American Foulbrood. The Northland Pest Management Strategies are not considered to be inconsistent with these Strategies.

These Northland Regional Pest Management Strategies have been prepared, taking into account related Strategies, policy statements and plans. Under section 76(4) of the Biosecurity Act, RPMS are not to be inconsistent with:

- a. Any national or Regional Pest Management Strategy (whether relating to the same region or any other region or regions) concerning the same organism; or
- b. Any regulation; or
- c. Any Regional Policy statement or Regional Plan prepared under the Resource Management Act 1991.

9. EFFECTS OF IMPLEMENTING THE STRATEGIES

The Biosecurity Act requires Pest Management Strategies to specify the actual or potential effects that the implementation of a Strategy may have on:

- a. The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and taonga.
- b. The environment; and
- c. The marketing overseas of New Zealand products.

9.1 Effects on Māori

The implementation of the Northland Regional Pest Management Strategies is anticipated overall to have positive effects on Māori culture and traditions. The Strategies should enable Northland Māori to address the impacts of pests within their rohe through education and advice and, more specifically, through site-led programmes such as Community Pest Control Areas. The implementation of the Strategies will also reduce the risk of incursion by new pests and thereby avoid impacts upon cultural values.

Iwi will also have the option to undertake or participate in community/stakeholder pest control, which will enable iwi to address pests within their rohe and have input into the practices utilised to manage pests via pest management plans. The NRC may also have regard to the provisions of hapu/iwi management plans in developing pest management policy.

Accordingly, the risk of adverse effects on tikanga, kaitiakitanga, taonga and wāhi tapu as a result of pest control is minimised and the Northland Regional Pest Management Strategies are considered to have beneficial effects for Māori and their cultural and traditions with their ancestral lands, waters, wāhi tapu and taonga.

9.2 Effects on the Environment

The implementation of the Northland Regional Pest Management Strategies will reduce the risk of environmental impacts as a result of new pest incursions through increased surveillance within the region, and the development of response plans. Publicity campaigns and education programmes will raise awareness and increase the reporting of pests. The Strategies will enable communities and stakeholders to manage the impact of pests on the ecological, production, recreation and aesthetic values of the region through CPCAs.

Detrimental effects of the proposed Strategies include the use of herbicides and pesticides that can adversely impact non-target species, animal welfare and general public health. These effects will be minimised by only using registered toxins and approved animal control techniques. The NRC believes that any detrimental impacts arising from control operations will be low and would be less significant than the benefits. Control operations requiring the use of chemicals, structures or other such activity are subject to the provisions of the Resource Management Act 1991. As such, the Strategies are considered to have beneficial effects on the environment.

9.3 Effects on marketing of New Zealand products overseas

The implementation of the Strategies is not expected to have any significant impact on the marketing overseas of New Zealand products. However, surveillance for and the management of plant and animal pests may provide some minor improvement in the market for New Zealand goods overseas. Similarly, the control of pests in areas of significant ecological importance should enhance the biodiversity, recreational and aesthetic values important to tourism to some degree. Adverse effects will be minimised by only using registered toxins and approved animal control techniques. Consequently, the Strategies are expected to have a small positive effect on New Zealand's marketing overseas in general, and its export products.

10. FUNDING

The underlying tenet of the Biosecurity Act is that the beneficiaries of a Pest Management Strategy, or those who exacerbate a pest problem, should be required to pay.

Funding of the Strategies is determined through two Acts:

- Biosecurity Act 1993 – sections 77 and 97 – based on cost/benefit and exacerbator/beneficiary principles; and
- Local Government Amendment Act 2002 – sets out a process for apportionment of costs and developing funding mechanisms to test equity and reasonableness.

Section 77 of the Biosecurity Act requires a Strategy to specify:

- Beneficiaries and exacerbators;
- The rationale for the proposed allocation of cost; and
- Identify any unusual administrative costs or problems.

10.1 Beneficiaries and Exacerbators

Pest management is an individual's obligation in the first instance. Individuals are beneficiaries and exacerbators of pest problems, to varying degrees. The extent to which an individual contributes to pest problems depends on whether their inaction has the potential to cause significant impairment to other occupier values or to the environment generally. It is often difficult to distinguish between beneficiaries and exacerbators as they can be one and the same, however the following are identified:

Beneficiaries include:

- The public, communities and individuals who derive direct or indirect benefit from pest control;
- Occupiers (including those who occupy the CMA);
- Sectoral public (i.e. industries, interest groups);
- The Crown; and
- Territorial authorities.

Exacerbators include:

- Those who transport, spread or provide habitat for pests (knowingly or otherwise); and
- Those, who through inaction, contribute to pest problems.

The NRC has determined that achieving the purpose and objectives of the Northland Pest Management Strategies provides 'public good' and that the regional community in general collectively benefits from the implementation of the Strategies.

10.2 Funding Sources and Rationale

The Plant Pest Management Strategy is expected to cost \$600,000 per annum. The Animal Pest Management Strategy is expected to cost \$435,000 per annum. The Marine Pest Management Strategy is expected to cost \$100,000 per annum. The NRC, pursuant to sections 16-18 of the Local Government (Rating) Act 2002, intends to fund the implementation of these Strategies by way of the existing biosecurity component of regional rates.

The Strategies are to be funded by rates because the pests in question have the potential to significantly impact the economic, biodiversity, recreation, amenity and cultural values of the region as a whole, and the regional community has an interest in protecting these values. As such, the Strategies provide 'public good' benefits region-wide.

The Strategies also provide for community/stakeholder pest control initiatives (CPCA) whereby, after NRC assistance, the community/stakeholder as beneficiary funds the ongoing cost of managing the pest. The community/stakeholder pest control schemes will also provide wider benefits beyond the control site through reduction of pest numbers, and as such initial ratepayer funding of these schemes is justified.

10.3 Cost Recovery

Section 135 of the Biosecurity Act provides Regional Councils with options to recover the costs of administering the Act and performing its functions, powers, duties under a Pest Management Strategy. The mechanisms include user charges and cost recovery in the event of non-compliance with a legal direction. Cost recovery is also used in specific circumstances as a disincentive to exacerbators, particularly where population density of a particular pest is very low and where land management practices undermine the Strategies objectives.

10.4 Compensation

In terms of section 76(1)(n) of the Biosecurity Act, no compensation shall be payable by the NRC with regard to losses incurred by individuals as a direct result of the implementation of these Strategies, including the removal of pests as required under the Strategies' rules.

10.5 Identification of Unusual Administrative Costs

No unusual administrative problems or costs are expected in recovering the costs to any of the persons that are required to pay.



Putting Northland first

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