Future directions for pest management in Taranaki

Review of the Pest Management Strategy for Taranaki: Animals and the Pest Management Strategy for Taranaki: Plants

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This paper has been prepared as a starting point for targeted consultation on the future directions for pest management in Taranaki. Feedback on the working paper will inform the development of a proposed Pest Management Plan for Taranaki, which will be released for full public consultation in late 2013 (following consultation and the promulgation of the National Policy Direction for Pest Management).

If you would like to take this opportunity to provide feedback on the working paper, please submit it in written form to the Council by **Friday 31st of May 2013**. If your organisation is interested in meeting to discuss or clarify matters raised in the working paper, please do not hesitate to contact the Council.

To obtain further copies of this working paper visit www.trc.govt.nz; call at the Taranaki Regional Council offices: **47 Cloten Road, Stratford**; or phone **06) 7657127**.

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1. Introduction

1.1 Purpose

The purpose of this working paper is to review the Taranaki Regional Council's (the Council) management approach and programmes relating to pest management in the region.

This paper contributes to the Council's review of the *Pest Management Strategy for Taranaki: Animals* (Pest Animal Strategy) and *Pest Management Strategy for Taranaki: Plants* (Pest Plant Strategy).

1.2 Background

The Biosecurity Act 1993 (the BSA) provides a legal basis for excluding, eradicating and effectively managing pests and unwanted organisms, and its powers can be used by, regional councils and pest management agencies, the Ministry of Primary Industries, and other government agencies. [1]The enactment of the Biosecurity Law Reform Act 2012 in September 2012 updated the BSA and included potentially substantial changes to the future scope and content of future pest management plans in the Taranaki region.

While the Council plays a significant role in pest (both animal and plant) management in the Taranaki region, many other parties are also involved. Collectively pest management activities across the Taranaki region, contribute to a wide range of economic, environmental, human health and socio-cultural outcomes.

Pest management is a not an outcome in itself; rather it is one of a number of interventions that contribute to multiple outcomes. These interventions are carried out in partnership with central government, local government, and non governmental organisations.

The first phase of pest management is prevention and exclusion, whereby the entry and establishment of unwanted organisms is prevented, often through border controls and the monitoring of potential pathways.

Surveillance and response involves the early detection, identification and assessment of pests and unwanted organisms before they become established. On a national level, this is carried out by the Ministry of Primary Industries, who carry out targeted and pathway surveillance in known risk areas.

On a regional level, the Council oversees surveillance for unwanted pests and organisms through a range of avenues. This includes responding to public reportings of new organisms or organisms not established in the region, e.g. rooks, inspecting nurseries for National Pest Plant Accord species and the like. Once a pest is established in the region, and if regional intervention is warranted, the pest is to be managed by the Council in the Pest Management Plan.

In relation to its pest management activities, the Council spends over two million dollars each year managing plant and animal pests where there is a public good. To date, the Council has achieved considerable success and public support through the provision of advisory, inspectorial and where necessary, enforcement services to land occupiers for the control of declared pests. Currently, there are 23 animals and 27 plants declared as pests in the Pest Animal Strategy and Pest Plant Strategy.

Of note, not all harmful plants and animals should be declared pests in a regional pest management strategy. For many harmful plants and animals it is not appropriate, necessary or reasonable for regional intervention to take place with the resulting imposition of public and private costs (including compliance costs) on others. The purpose of declaring a pest is to apply a statutory framework where regional intervention to manage an organism capable of causing economic and/or environmental loss in the region is appropriate. The regional impacts of a plant or animal have to be high to warrant being declared a pest, and the net benefits of regional intervention must outweigh the cost. The BSA enables the

[1] *Most 'pest' management is voluntarily done by land occupiers at their discretion.*

Council to develop a pest management approach that is specific to the region's needs, and communities' expectations.

The current pest animal and plant strategies were adopted in late 2007. They have a ten year planning horizon but must be statutory reviewed after five years. The strategies set out the Council's strategic and regulatory framework for managing pests in the region.

Five years on the Council must commence a review of its strategies under the BSA. There are significant changes to the legislative framework for developing and reviewing pest management plans that the review will need to take into account. The review of the pest management strategies is also an opportunity to reassess the efficiency and effectiveness of the Council's current programmes, to ensure that we are making the best use of available resources to effectively manage the pests that are of most concern to the environment and economy of our region.

This paper is a starting point for engaging with stakeholders on possible changes to pest management to be included in a proposed *Pest Management Plan for Taranaki*.

1.3 Scope

This paper contributes to the Council's review of the *Pest Management Strategy for Taranaki: Animals* and *Pest Management Strategy for Taranaki: Plants*. As such the scope of the report is confined to the Council's pest management responsibilities under the BSA and does not address pest management undertaken by other agencies under other legislation.

The paper takes into account recent policy changes to pest management, including the enactment of the Biosecurity Law Reform Bill 2012, and the future promulgation of the national policy direction, plus new statutory requirements for the Crown to comply with any "good neighbour" rules. An evaluation of the efficiency and effectiveness of the current programmes is also presented.

The paper further sets out the outcomes of an internal review exercise to assess the efficiency and effectiveness of current individual pest management programmes and the design of future programmes.

Overview of the intervention logic model

The intervention logic model is increasingly being used internationally and nationally as a planning tool to review and design programmes and to test the underlying rationale for public interventions.

The logic model ensures that, as part of the planning process, there are appropriate connections between resources (funding, equipment), activities (interventions/work programmes) and the outcomes being sought. In so doing, those involved must look at the bigger picture, to uncover underlying assumptions and, in particular, reveal why a particular intervention is expected to lead to a particular result.

As part of the review of its pest management strategies, Council has applied the intervention logic model.[2] The process involved a series of workshops and the development of this paper to assist in informing the review of its pest management strategies.

Fourteen workshops were held throughout February and March 2012 involving key staff from the Pest Management, Inspectorate, and Policy sections of the Council. At those workshops staff evaluated what outcomes are sought in relation to individual pest animal or plant species, and then evaluated (taking into account programme inputs and outputs) how that species could be managed in the future. Any assumptions, risks and uncertainties in the logic on which the programme is designed were also documented.

The workshops identified a number of initial technical information gaps, particularly relating to species distribution information. As appropriate additional information was sought and then inputted into worksheets.

A second series of workshops were then held involving planning, pest management, inspectorate and other relevant staff (e.g. biodiversity) to test the preliminary findings and review the draft worksheets. As

[2] *Based upon the advice set out in the Landcare Research report 'Setting Outcomes and Measuring Performance of Regional Council Pest and Weed Management Programmes'.*

appropriate the worksheets were amended. The findings of that work, including an explanation of the intervention logic model methodology, process and criteria are set out in the companion document: '*Review of the Pest Management Strategy for Taranaki: Animals, and Pest Management Strategy for Taranaki: Plants, Intervention logic model worksheets*'.

1.4 Structure

This working paper has five sections:

Section 1 introduces the report, including its purpose, background and structure.

Section 2 outlines the recent legislative and policy change factors to be taken into consideration in the development of a proposed Pest Management Plan for Taranaki.[3]

Section 3 evaluates the efficiency and effectiveness of the Council's current pest management programmes.

Section 4 sets out proposed changes to future programmes to be considered as part of the review. Assumptions and risks to the success of each programme are also identified.

Section 5 summaries key findings and conclusions reached in this paper.

Appendices are presented, defining terms and discussing the cost of pest management programmes.

This paper should be read in conjunction with the companion document, *Review of the Pest Management Strategy for Taranaki: Animals, and Pest Management Strategy for Taranaki: Plants, Intervention logic model worksheets.*

[3] *Pursuant to amendments to the BSA, future 'pest management strategies' have been re-named as 'pest management plans'.*

2 Policy change factors

This section outlines recent policy change factors to be taken into consideration in the review of the Council's pest management strategies and in the development of a proposed *Pest Management Plan for Taranaki*.

2.1 National Plan of Action 2011

In early 2009, the Government initiated the Future of Pest Management project (FOPM) project to identify the critical changes needed to improve pest management systems to meet New Zealand's needs over the next 25 years.

The FOPM project was a 'whole of government/whole of sector' approach, involving regional councils, which sought to address five key areas identified for improvement, these being:

- lack of clarity in pest management roles and accountability
- Crown obligations as a 'good neighbour' landowner do not match those of other parties
- the legislation underpinning pest management activity is outdated
- physical control and pest management monitoring tools are insufficient for future needs
- collective action and participation in pest management is insufficient.

As a result of the Future of Pest Management Project, inter-agency agreement was been reached on a wide range of issues and the Government adopted the *Pest Management National Plan of Action 2011*. Recommendations set out in the Plan of Action included the promulgation of the Biosecurity Law Reform Act (refer section 2.2 below), and the development of a draft *National Policy Direction* (refer section 2.3 below).

Of particular relevance to this paper, were recommendations in the *Pest Management National Plan of Action* supporting the introduction of good neighbour rules. However, given the potential for good neighbour rules to increase the fiscal risk to the Crown, further recommendations were made to ensure there was robust and more transparent decision-making processes associated with the development of new regional pest management plans.

In relation to regional pest management plans, and through the promulgation of the Biosecurity Law Reform Act and the National Policy Direction, changes were sought to plans/programmes that encapsulated 'best practice' and involved:

- the use of less 'open' narrative objectives in plans so as to make it easier to assess the value and success of programmes over time
- better consistency in regional pest management objectives across New Zealand to ensure it is easier to obtain a national overview on the effectiveness of objectives across the country
- aligning terminology adopted for pest programmes and their objectives so as to make it difficult for other parties to understand terms and relationships between objectives and rules in programmes.

2.2 The Biosecurity Law Reform Act 2012

The Biosecurity Law Reform Act was enacted in September 2012.

The purpose of the amendment was to update the BSA and to allow the biosecurity system to respond to an increasingly challenging environment. It made a number of significant amendments to the BSA. Changes of particular importance to regional councils reviewing their regional pest management plans are:

- the inclusion of national and regional leadership responsibilities for pest management
- the inclusion of new policy instruments such as the National Policy Direction and pathway management plans
- the inclusion of good neighbour rules and requirement for the Crown to comply with such rules in a regional pest management plan

- changes to the development and review process for pest management plans.

These changes and their implications are addressed in further detail in section 2.4 below.

2.3 The National Policy Direction

At the time of writing, the Government has drafted a Proposed National Policy Direction for Pest Management (that they have consulted regional councils on) and is seeking to commence public consultation on that proposal by mid 2013.

The National Policy Direction, once promulgated, has the force and effect of regulation.[4] Amongst other things, the National Policy Direction specifies requirements for the setting of good neighbour rules and objectives, the development of cost benefit analysis for proposed pest programmes, plus other matters.

The purpose of the National Policy Direction is to ensure that the pest management activities that occur under Part 5 [Pest management] of the BSA provide the best use of available resources for New Zealand's best interests and align activities where appropriate to national outcomes by:

- clarifying what the national outcomes are
- clarifying requirements for using the regulatory instruments under Part 5 of the BSA to manage pests and pathways
- ensuring consistent application of these requirements nationally and between regions.

Under section 100E of the BSA, regional pest management plans (and other pest management activities that occur under the Act) must comply with the National Policy Direction.

When the National Policy Direction is in place, the Council will be required to ensure that any proposed regional pest management plan is aligned with the Direction. Again there are significant changes of particular importance to regional councils reviewing their regional pest management plans. These changes are addressed in further detail in section 2.4 below.

2.4 Implications for the review of regional pest management strategies

Of particular significance to regional councils reviewing their pest management strategies, arising from the amendments to the Biosecurity Act and promulgation of the National Policy Direction, are the following matters.

2.4.1 New Crown obligations and the setting of good neighbour rules

Under the current regional pest management strategies, the Crown is not bound to Strategy rules. Despite Crown land representing 20% of the region, in Taranaki, as in other regions, it has been problematic getting agreement from the various Government departments and agencies managing Crown land to be bound by the provisions of the strategies.[5] This situation resulted in pests spilling over onto neighbouring land, and reduced the effectiveness and efficiency of pest management in a region. However, following the enactment of the Biosecurity Law Reform Act, the Crown is now required to meet "good neighbour" rules within regional pest management plans, ensuring that regional pest management efforts are more effective.

Good neighbour rules are those that seek to manage pests that cause external costs to other land holders. The Crown will be bound to good neighbour rules in regional pest management plans once the plans have been aligned with the National Policy Direction. This means that all land occupiers, regardless of tenure, will be required to meet good neighbour rules under regional pest management plans.

While good neighbour rules might be similar in kind to many of the current strategy rules

[4] *The National Policy Direction is deemed to be a regulation for the purposes of the Regulations (Disallowance) Act 1989, but is not a regulation for the purposes of the Acts and Regulations Publications Act 1989.*

[5] *Under section 87 of the BSA, and prior to the recent amendments, the Crown could not be bound unless there was an Order-in Council.*

requiring land occupiers to destroy pests on their land, they are not necessarily the same thing. Current and future rules will need to be designed to ensure they are fair and reasonable and can be demonstrated not to be imposing unnecessary costs on the Crown (and other land occupiers).[6]

2.4.2 Changes to terminology

A seemingly minor change to the BSA is changing the name of *'pest management strategies'* to *'pest management plans'* to better reflect their regulatory and operational nature. The product of the review process will therefore be a regional pest management plan combining the two current pest management strategies.

Of more significance, the *National Plan of Action* noted that the pest management system was characterised by different decision makers (both national and regional) adopting different terminology to describe similar programmes. Therefore Clause 5(1) of the National Policy Direction introduces terminology that all regional councils must adopt in their reviewed pest management plans for describing the types of pest programmes. In so doing, the Government anticipates better alignment, consistency and transparency in terminology across the system and between pest management plans.

Clause 5(1) of the draft National Policy Direction reads:

"…for each subject in a pest management plan … the plan must contain one or more of the following programmes, and may not contain any other types of programmes:

(i) ***Exclusion Programme*** *(if applicable) in which the intermediate outcome for the programme is to prevent the establishment of the subject, or an organism being spread by the subject, that is present in New Zealand but not yet established in an area*

(ii) ***Eradication Programme*** *(if applicable) in which the intermediate outcome for the programme is to reduce the infestation level of the subject, or an organism being spread by the subject, to zero levels in an area in the short to medium term:*

(iii) ***Progressive Containment Programme*** *(if applicable) in which the intermediate outcome for the programme is to contain and reduce the geographic distribution of the subject, or an organism being spread by the subject, to an area over time:*

(iv) ***Sustained Control Programme*** *(if applicable) in which the intermediate outcome for the programme is to provide for the sustained control of the subject, or an organism being spread by the subject, in an area to a level where the costs imposed on persons are manageable:*

(v) ***Site-led Pest Programme*** *(if applicable) in which the intermediate outcome for the programme is that the subject, or an organism being spread by the subject, that is capable of causing damage to a place is excluded or eradicated from that place, or is contained, reduced, or controlled within the place to an extent that protects the values of that place:*

(vi) *If none of the outcomes in subclause c(i)-(v)are applicable, the plan must contain a* ***Pathway Programme*** *in which the intermediate outcome for the programme is to reduce the spread of harmful organisms. "*

2.4.3 Changes to the setting of objectives

A key step in developing regional pest management programmes is ensuring objectives suit the desired outcome. Pest management is not an end in itself but is done to help achieve a range of outcomes (objectives) sought by the community. Desired outcomes for pest management may be economic, environmental or social.

The draft National Policy Direction sets specific requirements for regional councils setting objectives in their regional pest management plans. Again the intent is to promote national consistency, and to ensure the links between programmes and their outcomes are communicated more effectively.

Section 6 (1) [Directions on setting objectives] of the draft National Policy Direction reads:

"…for each subject in a proposal for a pest management plan, or in a pest management plan, the objectives in the plan must:

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[6] *With the introduction of good neighbour rules there is increased fiscal risk to Crown land occupiers. Through the National Policy Direction there are explicit requirements relating to objective setting and the documentation of risk analyses to ensure decision-making processes and the imposition of compliance costs are robust and transparent.*

(a) state the particular adverse effect or effects referred to in section 54(a) of the Act that the plan addresses; and

*(b) state the pest management intermediate outcomes **that** the plan is seeking to achieve, being one or more of the following intermediate outcomes:*

*i. 'exclusion' which means to prevent the establishment of the subject **that** is present in New Zealand but not yet established in an area;*

*ii. 'eradication' which means to reduce the infestation level of the subject to zero levels in an area in **the** short to medium term;*

*iii. 'progressive containment' which means to contain and reduce the **geographic** distribution of the subject to an area over time;*

*iv. 'sustained control' which means to provide **for** the sustained control of the subject in an area to a level where the costs imposed on persons are manageable;*

*v. 'protecting values in places' which means that the subject that is **capable** of causing damage to a place is excluded or eradicated from that place, or is contained, reduced, or controlled within the place to an extent that protects the values of that place; and*

*(c) for each **outcome** in subclause (1)(b), specify –*

i. the geographic area to which the outcome applies; and

ii. the particular level of the outcome (if applicable); and

iii. the period within which the outcome is expected to be achieved; and

(d) if the period within which the pest management intermediate outcome is expected to be achieved is more than 10 years, state what is intended to be achieved in the first 10 years of the plan."

2.4.4 Documenting cost/benefit and risk analyses

The 2012 amendments to the BSA and draft National Policy Direction require a more explicit analysis and portrayal of the benefits and costs, including the **documentation** of the analysis and risk assessment results.

Clause 7(1) [Directions on analysing benefits and costs] of the draft National Policy Direction reads:

"…in the proposal for a pest management plan … an analysis of the benefits and costs of the plan for each subject must:

(a) identify and value the benefits and costs of the plan, including the direct costs to land occupiers of complying with rules in the plan;

(b) state the assumptions (if any) on which the analysis is based; and

(c) be at an appropriate level of detail as determined in accordance with subclause (2); and

(d) identify and quantify risks to being successful; and

(e) *analyse and compare different options*."

The draft National Policy Direction seeks transparency in identifying any assumptions and risks (Clause 7(1)(b) and (d) a). The National Policy Direction, further requires regional councils (as proposer), when identifying and quantifying the risks to being successful under sub clause (1)(d), to consider the risk:

(a) that the management approach chosen cannot effectively achieve the objective being sought

(b) that the management approach chosen will be inadequately applied

(c) that other stakeholders, agencies, or legal processes will adversely affect implementation of the plan

(d) of causing unintended adverse effects, and

(e) that public and political concerns will adversely affect implementation of the plan.

Further direction is also set out in clause 8 [Directions on proposed funding of costs] of the National Policy Direction, which requires the Council, when considering how it is proposed to fund a pest management plan, to:

(a) identify all significant exacerbators and beneficiaries for each subject, or an organism, being spread by each subject

(b) group known exacerbators and beneficiaries based on how they affect the need for pest or pathway control

(c) assess each group's ability to:

(i) change its behaviour to reduce the costs of the pest or pathway control

or change its behaviour to reduce the risks that give rise to the need for the pest or pathway control

(ii) determine whether the benefits of the pest or pathway control outweigh the costs of such control, and

(iii) determine whether the pest or pathway control is being delivered most cost-effectively,

(d) assess how costs can be allocated fairly and in a practical way, and

(e) document the steps and assessments carried out under subclause (a) to (d) and how any other factors have been considered in making the proposal on funding.

This documentation will be contained within a Section 71 report, which will be released alongside the *Proposed Regional Pest Management Plan for Taranaki.*

3 Efficiency and effectiveness of the current approach for pest animal management

This section examines the efficiency and effectiveness of current programmes in the Pest Animal Strategy and the Pest Plant Strategy. At its simplest, this involves an evaluation of whether outcomes sought have been achieved and if progress is being made at an acceptable rate.[7]

Evaluating policy efficiency and effectiveness involves an assessment of monitoring results relevant to both strategies and, in relation to programme objectives, whether:

- the Council is making progress in the implementation of its policies and methods (e.g. number of properties inspected, treated, and/or advocacy undertaken) at an acceptable rate
- the outcome sought to be achieved by the strategies through, for example, the location, spread and distribution of pest species has been achieved
- the Council is on the right track towards the objective.

Following this assessment of effectiveness, conclusions can be drawn on the efficiency of the strategy. That is, does the delivery of the strategies represent value for money?

3.1 Have methods been implemented?

This section identifies the means (methods) of achieving programme objectives identified in the *Pest Management Strategy for Taranaki: Animal*s and *Pest Management Strategy for Taranaki: Plants* and assesses whether and to what extent the Council has delivered on its commitments (as set out in the means of achievement for the respective strategies).

3.1.1 Monitoring Strategy methods

Both the Pest Animal Strategy and Pest Plant Strategy identify the means and programmes by which the Council will monitor its effectiveness and efficiency. They include:

- inspection programme to monitor land occupier compliance with rules
- recording the number of public complaints pertaining to individual pest species
- recording instances of non-compliance with the strategy rules, and the Council's response
- recording the number of public enquiries in relation to individual pest species, including requests for information
- mapping and monitoring the implementation of the Self-help Possum Control Programme
- monitoring and mapping pest population densities and trends, over time
- monitoring the effectiveness of any direct control undertaken by the Council.

3.1.2 Implementation of the Pest Animal Strategy

Implementation of the pest animal management programmes set out in the Pest Animal Strategy accounts for just over 1.5 million dollars of annual Council expenditure. Between 2007 and 2012, 9 full-time Council pest management officers have implemented the programmes with a focus on:

- the control of possums prior to new areas being included in the Self-help Possum Control Programme – approximately 6300 hectares added to the Programme over the duration of the Strategy
- supporting the Self-Help Possum Control Programme by ensuring that landholders maintain possum populations within acceptable limits as at 30 June 2012 4,289 properties covering 231,000 hectares of intensively farmed land is covered by the Programme(this programme accounts for just over one million dollars of the pest animal annual budget)

[7] *Enfocus Limited, July 2008: 'Evaluating Regional Policy Statements and Plans – A Guide for Regional Councils and Unitary Authorities'.*

- responding to and taking necessary actions on all pest animal complaints within five days of receipt
- the control of other pest animals including feral goats, feral pigs, feral deer, feral cats, hares, mustelids, pest fish and magpies on a site-led basis
- providing advice and information to landowners, and undertaking publicity campaigns for argentine ants, rooks, goats and pest fish
- the provision of advice, support and other assistance for invasive animal species not identified as pests in the Strategy
- the provision of advice, support and other assistance for land occupiers and community groups carrying out pest control and conservation work in Key Native Ecosystems in the region in accordance with the Council's Biodiversity Strategy.

In summary, the Council has delivered on all its commitments as set out in the means of achievement for the Pest Animal Strategy. Table 1 on page 11 and 12 provides a summary of progress in implementing the means of achievement for pest animal management programmes over the duration of the Pest Animal Strategy.

3.1.3 Implementation of the Pest Plant Strategy

Pest plant management accounts for just over $400,000 of annual Council expenditure. Between 2007 and 2012, 2.5 full time equivalents have been implementing the programmes contained in the Pest Plant Strategy. Highlights include:

- 278 direct control operations to eradicate known infestations of 'eradication' pest plants
- undertook 51,105 property inspections to enforce land occupier obligations to destroy 'containment' pest plants
- an average of 39 garden nursery inspections per annum over the duration of the Strategy to implement the National Pest Plant Accord and promote and enforce prohibition from propagations, sale or distribution of specified unwanted plant organisms
- introduction and/or release of 21 different biological control agents
- responding to and take necessary actions on all pest plants complaints within five days of receipt
- providing advice and information to landowners, and undertaking publicity campaigns for pampas and controlling pest plants.
- the provision of advice, support and other assistance for invasive plant species not identified as pests in the Strategy
- the provision of advice, support and other assistance for land occupiers and community groups carrying out weed control and conservation work in Key Native Ecosystems in the region in accordance with the Council's Biodiversity Strategy.

In summary, the Council has delivered on all its commitments as set out in the means of achievement for the Pest Plant Strategy. Table 1 on page 12 provides a summary of progress in implementing the means of achievement for pest plant management programmes over the duration of the Pest Plant Strategy.

3.1.4 Landholder (compliance) costs

The cost of compliance with the pest management strategies is relatively low compared to the anticipated benefits. For most land occupiers, any physical works or chemical applications required by the strategies is carried out as part of their normal farming/land management practices.

Of note not all of the aforementioned expenditure is a regulatory requirement. Land occupiers are generally 'best placed' to decide when and where and by how much they need to take control to realise the anticipated benefits. However, a fair proportion of the control is likely to be a regulatory requirement and might be above and beyond what they might be done – especially where they are not the principal beneficiary of that control (e.g. being a good neighbour) or where the benefits are not production related (e.g. conservation).

As highlighted in Figure 1 below a review of the Ministry of Primary Industries and Beef and Lamb NZ data for average pest and weed control costs for Taranaki dairying and sheep and beef properties shows that there has been

no significant increase in costs over the duration of the strategies.

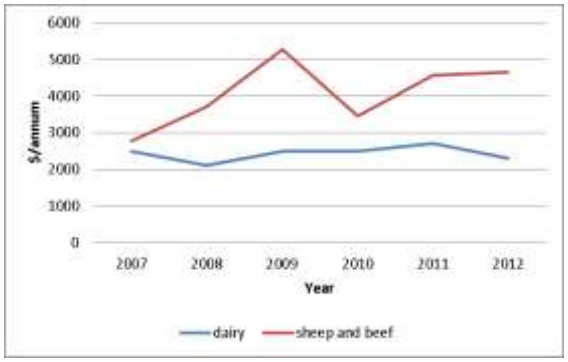

Figure 1: Cost of pest and weed control for dairying and sheep and beef properties in Taranaki 2007 -2012

3.1.5 Compliance with the strategies

A review of the Council's compliance and inspection programmes further confirms that, since the adoption of the pest animal and plant strategies, compliance with strategy rules has been high, increasing over the life of the Strategies. Accordingly, the Council's administrative costs associated with the enforcement regime are relatively low with minimal public costs on ratepayers.

The number of properties that have problems with management of eradication or containment pest plants (Category C properties) is steadily decreasing, indicating a growing level of compliance with Strategy rules. From 2006/07 to 2011/12, there was a 99.6% compliance rate with Notices of Direction issued for landowners to control pest plants.

Compliance with the Self-help Possum Control Programme has increased from 70% compliance (landowners in the programme maintaining possum numbers to below 10% RTC) in 2007 to 94% in 2012. In most cases, the level of non-compliance was not significant (eg. monitoring recorded one too many possums).

While the costs of implementing the Self-help Possum Control Programme are not insignificant nevertheless the costs are relatively minor in comparison to the actual and potential production, animal health and environmental outcomes being achieved. Accordingly, the programmes set out in the strategies are considered an appropriate response to the issues.

Appendix I provides a summary of the benefits and costs of the Strategy, which will be built upon in the Section 71 analysis stage of the review.

3.1.6 Overview on progress in implementing pest animal and plant strategies

Set out in Table 1 below is a summary of the Council's progress in implementing the pest animal and plant strategies (as at 30 June 2012). These matters are reported on annually in the Council's significant activity reports relating to its biosecurity functions.

Table 1: Summary of progress: implementing means of achievement for pest management

What did we promise to deliver?		Where are we at?	Conclusion
Pest Animal Strategy	Provision of advice and information	Responded to requests for information on pest animal species on 1541 occasions over the life of the Strategy (average of 256 requests per annum) Prepared and distributed guidelines and pamphlets Prepared and distributed press releases and Recount newsletters, maintain information on website Publicity campaigns carried out for Argentine ants, rooks, pest fish and goats	Commitment is being delivered
	Monitoring and inspection regime	5211 property inspections completed over the life of the Strategy to ensure compliance with self help possum control programme (average of 1488 per annum).	Commitment is being delivered

What did we promise to deliver?		Where are we at?	Conclusion
	Enforcement of Strategy rules	37 Notices of Direction served over the life of the Strategy for not complying with Self help possum control programme (average of 6 per annum) 100% of Notices Of Direction complied with.	Commitment is being delivered.
	Direct control in KNEs	Assisted with pest control operations in KNEs (with biodiversity plans) throughout the life of the Strategy (34 KNEs in 2011/12) involving possum, mustelid, and rabbit control.	Commitment is being delivered
	Direct control to eradicate	Direct control undertaken where required for rooks	Commitment is being delivered
	Self-help Possum Control Programme	4,289 properties covering 231,000 ha now incorporated in the programme (as at 30 June 2012) 21,171 contacts with landowners for advice on possum control maintenance over the life of the Strategy (3528 on average per annum) Average RTC of 3.3% at 30 June 2012 (well below the Council target of 10%) 93.5% compliance with 10% RTC at 30 June 2012 (increased from 70% compliance in 2006/07) Direct control undertaken on 128 properties over the life of the Strategy to protect the integrity of the programme (21 on average per annum) 63 of 111 privately owned KNEs included in the Self-help Programme at 30 June 2012.	Commitment is being delivered.
Pest Plant Strategy	Provision of advice and information	Responded to 1,760 requests for information over the life of the Strategy on pest plant species Prepared and distributed guidelines and pamphlets Prepared and distributed press releases and Recount newsletters, maintain information on website Publicity campaigns carried out for pampas and control of pest plants in general.	Commitment is being delivered
	Monitoring and inspection regime	1,744 category C properties inspected on at least 3 occasions relating to pest plant species carried out from 2006/2007 to 2011/2012 6,202 category B properties inspections carried out from 2006/2007 to 2011/2012 43,568 category A species inspections carried out from 2006/2007 to 2011/2012 (tied in with advice and education, responses to complaints, response to requests for information).	Commitment is being delivered
	Enforcement of Strategy rules	Responded to 630 complaints from the public over the life of the Strategy. (average of 105 per annum) 1513 Notices of Direction served, 2 default works undertaken, and no prosecutions from 2006/2007 to 2011/2012 99.6% compliance with NODs from 2006/2007 to 2011/12.	Commitment is being delivered.
	Direct control in KNEs	Direct control undertaken in KNEs where required.	Commitment is being delivered
	Direct control to eradicate	Direct control of eradication pest plants undertaken by Council on 278 occasions, and landowners directed to carry out control on 86 occasions from 2006/2007 to 2011/2012. On-going surveillance and re-treatment of some infestations is required.	Commitment is being delivered
	Biological control programmes	Biological control programmes for Old mans beard, ragwort, gorse and thistles are established and widespread throughout Taranaki. Programmes continue to be implemented and monitored.	Commitment is being delivered.

3.2 Effectiveness of pest animal management programmes

With regards to pest animal programmes, the current management approach, with the exception of Argentine ants, has been effective.

3.2.1 Rook eradication

There are currently no known breeding rook populations in Taranaki. A proactive surveillance and control programme has been operating since 1996 to locate and control any juvenile or migratory rooks. Few incursions, other that the public reports of individual birds, have been recorded over the duration of the pest animal strategy. Currently there are three individuals known to be present in Taranaki; in Brixton, Hawera, and Patea.

Individual birds can be difficult to locate, however any reportings or sightings are followed up by Council officers and control is undertaken where possible. Rooks are intelligent birds, which makes them difficult to control. An unsuccessful control attempt can cause the birds to become wary, and for this reason the Council is best placed to carry out control.

3.2.2 Possum control

Possum control, and in particular the implementation of the Self-help Possum Control Programme, remains the focus of the Council's pest animal management activities. It represents approximately 90% of the Pest Animal Strategy's cost.

Over the duration of the Pest Animal Strategy, the Council has, through the Self-help Possum Control Programme, ensured there has been effective possum control on intensively farmed land. As at 30 June 2011, approximately 231,000 hectares of Taranaki's ring plain (Figure 2) has sustained possum control where possum infestation levels are on average 3.3% residual trap catch (Figure 3). This is significantly below the 10% target considered necessary to protect pastoral production and the canopy of remnant forests and wetlands in the area.

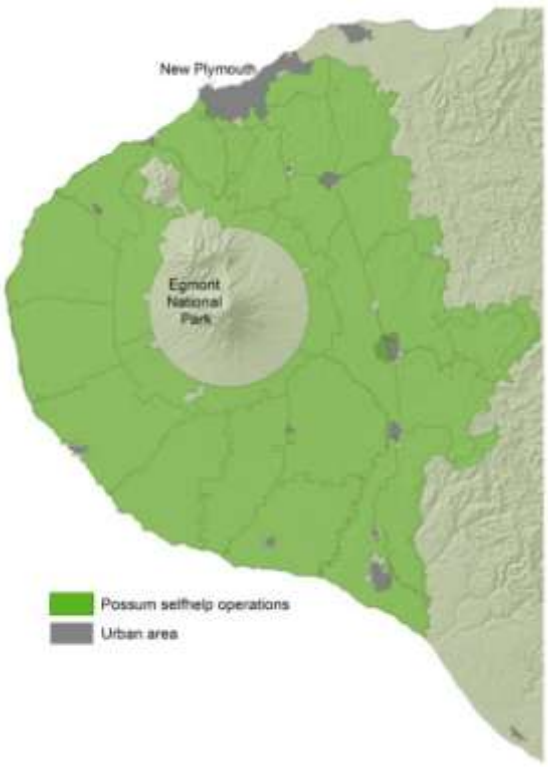

Figure 2 Area covered by the Self-help Possum Control Programme

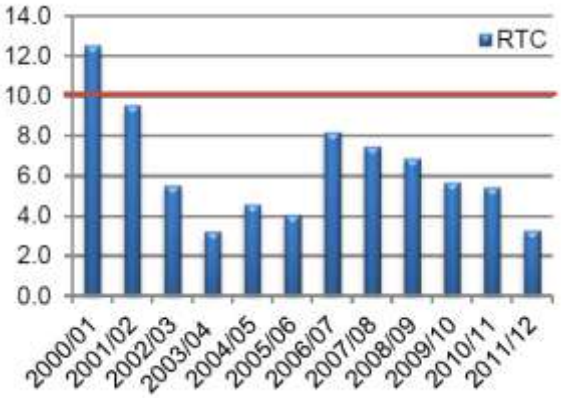

Figure 3 Mean RTC rate for the Self-help Possum Control Programme over time

With such a large area of the region now covered by the Self-help Possum Control Programme, on-going liaison with farmers, monitoring, and other support is required to ensure possum numbers on the ring plain are maintained at low levels.

In the eastern hill country, outside of the Self-help Programme, there are relatively high possum numbers of around 30% RTC. Council efforts in such areas is to promote and support community and care groups undertaking voluntary possum control in the area, e.g. Lake Rotokare, Eastern Taranaki Environment Trust, and Paraninihi as widespread intensive possum control across private properties in the hill country, irrespective of the public and private benefits, is unlikely to be cost effective.

3.2.3 Rabbit control

The Council enforces current Strategy rules to ensure that rabbit infestation levels do not affect neighbouring properties.

Monitoring of rabbit infestations is carried out on rabbit prone land in coastal Taranaki, and direct control of rabbits and hares is undertaken by the Council where required, particularly to protect new plantings in the Riparian Management Programme. That monitoring confirms that rabbit infestations remain at manageable levels in Taranaki, and in recent years there has been a declining number of public enquiries about control methods.

3.2.4 Argentine ant control

The current Pest Animal Strategy includes strategy rules requiring land occupiers to control infestation levels to manage externality impacts on neighbouring properties.

Extensive monitoring confirms that Argentine ants are now well established throughout urban and coastal areas in the region. Over the life of the Strategy, the Council has changed its focus from compliance monitoring to raising awareness, providing control advice, and providing a link to poison suppliers.

The Council continues to respond to public enquiries for the management and control of Argentine ants, but the invasive nature of this species means that the enforcement of land occupier obligations to control Argentine ants is now considered unduly onerous and unreasonable. This is one management programme where a significant change in the adopted management approach is sought.

3.2.5 Other

The Department of Conservation is the lead management agency for pest fish, with the Council playing a supporting role by providing advice and information, assisting with identification of pest fish, and responding to complaints.

Gambusia (mosquito fish), are currently present at three sites in the Waitara catchment. Koi carp and rudd are thought to be present in small numbers in the region, while there have been no confirmed sightings of brown bull-headed catfish during the life of the strategy. Exact distributions of the four species of pest fish in Taranaki will remain unknown until a comprehensive survey is undertaken. The Department of Conservation predict that populations of pest fish are increasing in the region, but more information is required to confirm this assessment. This lack of information provides a challenge for assessing the current situation.

Other pest animal species such as feral goats, brown hares, feral deer, feral pigs, cats, magpies and mustelids continue to be widespread and problematic. Given the lack of realistic options to manage these species over large areas, the role of the Council remains one of advocacy and education. The Council has increasingly moved towards a site led approach – carrying out control where required to protect biodiversity values in Key Native Ecosystems.

Set out in Table 2 overleaf is a summary of Council's progress on achieving outcomes sought for animal pest management.

Table 2 Summary of progress: achieving pest animal outcomes

Pest	What do we want to achieve (current objective)?	Where are we at?	Conclusion
Rooks	To prevent the establishment of rooks in the Taranaki region by eradicating all known (as at 1 May 2007) populations of rooks in the Taranaki region by 2017 and, as practicable, destroying any new populations of rooks that are identified over the duration of the Strategy.	• Individual birds only • Known infestations destroyed	Target being met
Argentine ants	To protect amenity, horticultural production, and biodiversity values by preventing the spread of Argentine ants from affected properties to neighbouring properties for the duration of this Strategy.	• Relatively confined in Taranaki but becoming widespread • Known infestations increasing • Rules not reasonable.	Target not being met
Possums	To protect agricultural production values and indigenous biodiversity values, for the duration of the Strategy by: (a) reducing infestations of brush tail possums to below a 10% residual trap catch on the ring plain through the implementation of the self help possum control programme; and, (b) promoting the voluntary control of possums throughout the region.	• Widespread in Taranaki • Infestation levels reduced and maintained at <6% residual trap catch on the ring plain • Widespread in eastern hill country infestations may be around 30% RTC • Community groups undertaking significant voluntary possum control over large parts of east Taranaki. • Programme not likely to be cost effective in the eastern hill country	Target being met
European rabbit	To protect agricultural production values by preventing the spread of European rabbits from affected properties to neighbouring properties for the duration of this Strategy.	• Widespread in Taranaki • Infestation levels being successfully maintained at below 3 on the McLean Scale • Reduction in the number of public complaints relating to rabbits over the duration of the Strategy	Target being met
Pest fish brown bull-headed catfish, koi carp, gambusia and rudd	To promote public understanding of the pest characteristic of …., and to facilitate the control of … by DOC and others for the duration of this Strategy.	• Species still relatively confined in Taranaki • Brown bull headed catfish not thought to be present in the region. *Gambusia* known to be present at 3 sites in Waitara catchment • Known infestations of pest fish thought to be increasing, however exact distributions for most species unknown.	Information needed to confirm achievement of target (or otherwise).
Other species Brown hare, feral cats, feral deer (red, sika, sambar, rusa, fallow, wapiti, white-tailed deer), feral goats, feral pigs, magpies, and mustelids (ferret, stoat, weasel)	To promote public understanding of the 'pest' characteristic of …., and to facilitate the voluntary control of …., for the duration of this Strategy	• Species widespread in Taranaki • Excluding feral goats, strong public awareness of the pest characteristics of these species • Increased education efforts in hill country to promote public awareness of the adverse impacts of goats • Site led response where appropriate.	Target being met

3.3 Effectiveness of pest plant management programmes

With regards to pest plant programmes, the current management approach has been effective for the majority of programmes (with the potential exceptions of Darwin's barberry, old mans beard, and giant buttercup).

3.3.1 Eradication programmes

Good progress is being made on the eradication of five of the seven eradication pest plant programmes – these being climbing spindleberry, mignonette vine, giant reed, Senegal tea and *Undaria.*

All known infestations of climbing spindleberry, mignonette vine, giant reed, Senegal tea and *Undaria* recorded as present at the time of adopting the Pest Plant Strategy (2007) have been treated and the infestations subsequently destroyed (recognising that subsequent visits and treatment has been required in the interim years). Furthermore as new previously unknown infestations have been identified, the Council has mapped and treated these additional sites. The majority of the plants targeted for eradication are 'garden escapees' and largely occur in urban areas.

The invasive and persistent nature of these species means that even if an infestation is treated and destroyed, new growth may occur the following season. Council continues to monitor treated infestations with the support of affected property owners who often take responsibility for monitoring and re-treating plants if regrowth occurs.

For two of the seven eradication pest plant programmes – these being Darwin's barberry and pampas – it is unlikely that eradication objectives set out in the Pest Plant Strategy will be achieved.

Despite considerable effort to reduce the distribution of Darwin's barberry, significant infestations still remain. The eradication outcome sought for Darwin's barberry is no longer considered a realistic objective having regard to the resources and effort required to achieve it. Darwin's barberry was always the more widespread of the 'eradication' species and it is timely to recommend that given its extent and the relatively minor impacts of the plant on agricultural production values, whether the plant still warrants regional intervention.

The eradication outcome sought for pampas grass has also not been achieved although heavy infestations of the plant have been significantly reduced across the region.[8] This species is clearly established and widespread in the region, especially where it has been used as shelterbelts and has subsequently invaded waste ground and roadsides. The current eradication objective sought for pampas is technically infeasible. However a management approach that targets the externality impacts of the plant is still achievable.

Figures 4 to 9 show the extent of infestations mapped for pest plants targeted for eradication in the region. They are indicative of the current (2011/12) distribution of pest plants in comparison to when the Pest Plant Strategy was adopted in 2007. The maps indicate where inspections and action have taken place for that species that year. For the eradication species, anecdotal observations have also be plotted on the map, to give a more accurate representation of the distribution of each pest.

[8] *The pampas programme has an eradication objective but its design is more similar to that of a Containment programme, which addresses the externality impacts of widespread pest plants through strategy rules addressing land occupier obligations. Better alignment between the programme objective and design is proposed in section 4 below.*

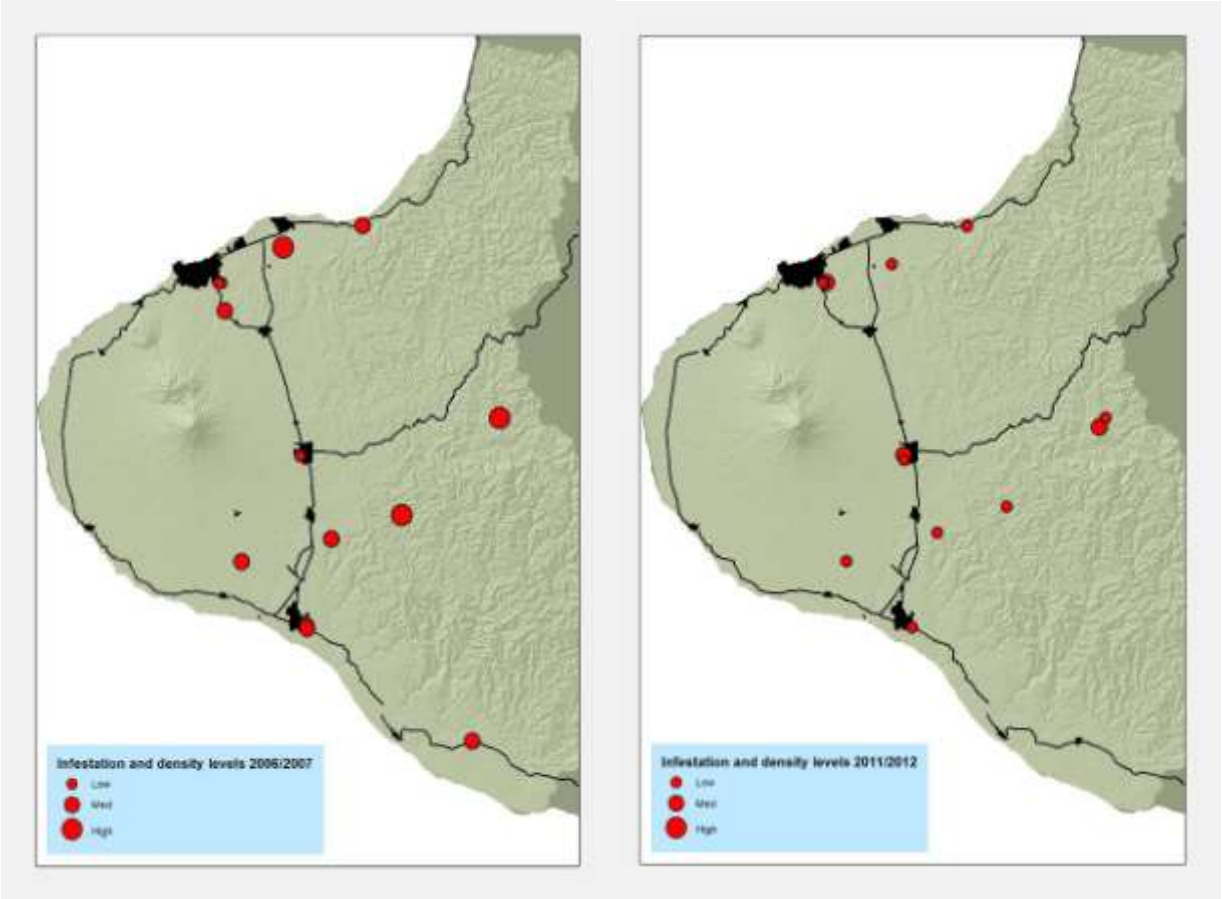

Figure 4 Climbing spindleberry infestation and density levels - 2006/07 (above left) and 2011/12 (above right)

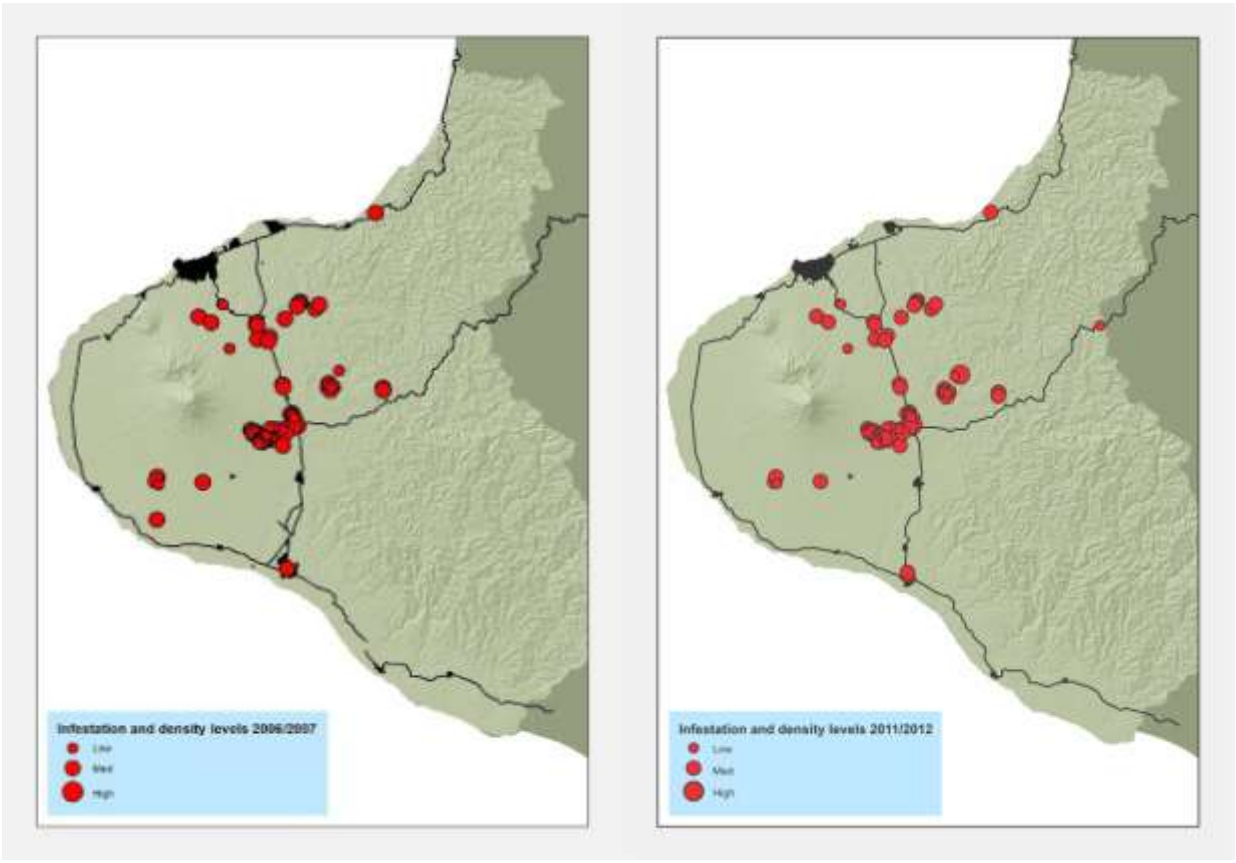

Figure 5 Darwin's barberry infestation and density levels 2006/07 (above left) and 2011/12 (above right)

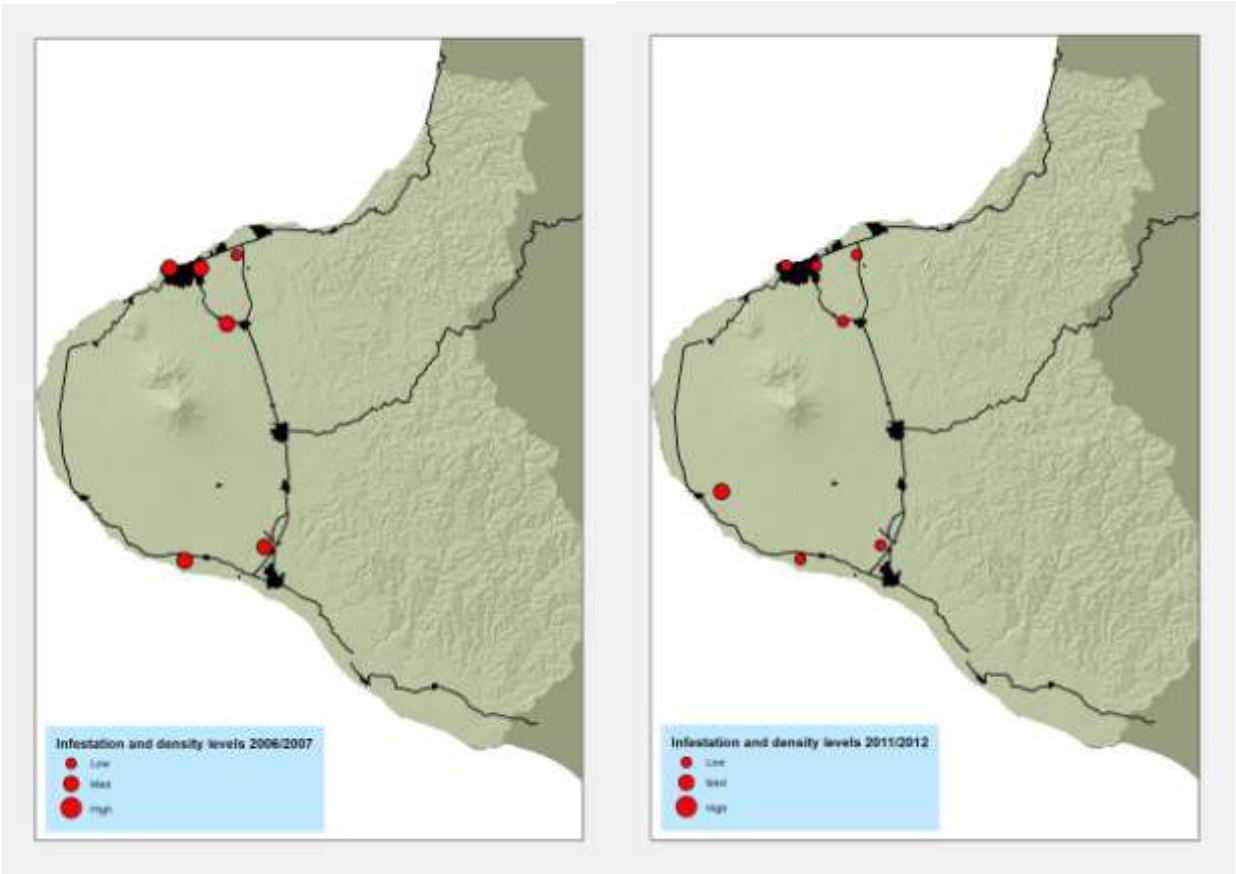

Figure 6 Giant reed infestation and density levels 2006/07 (above left) and 2011/12 (above right)

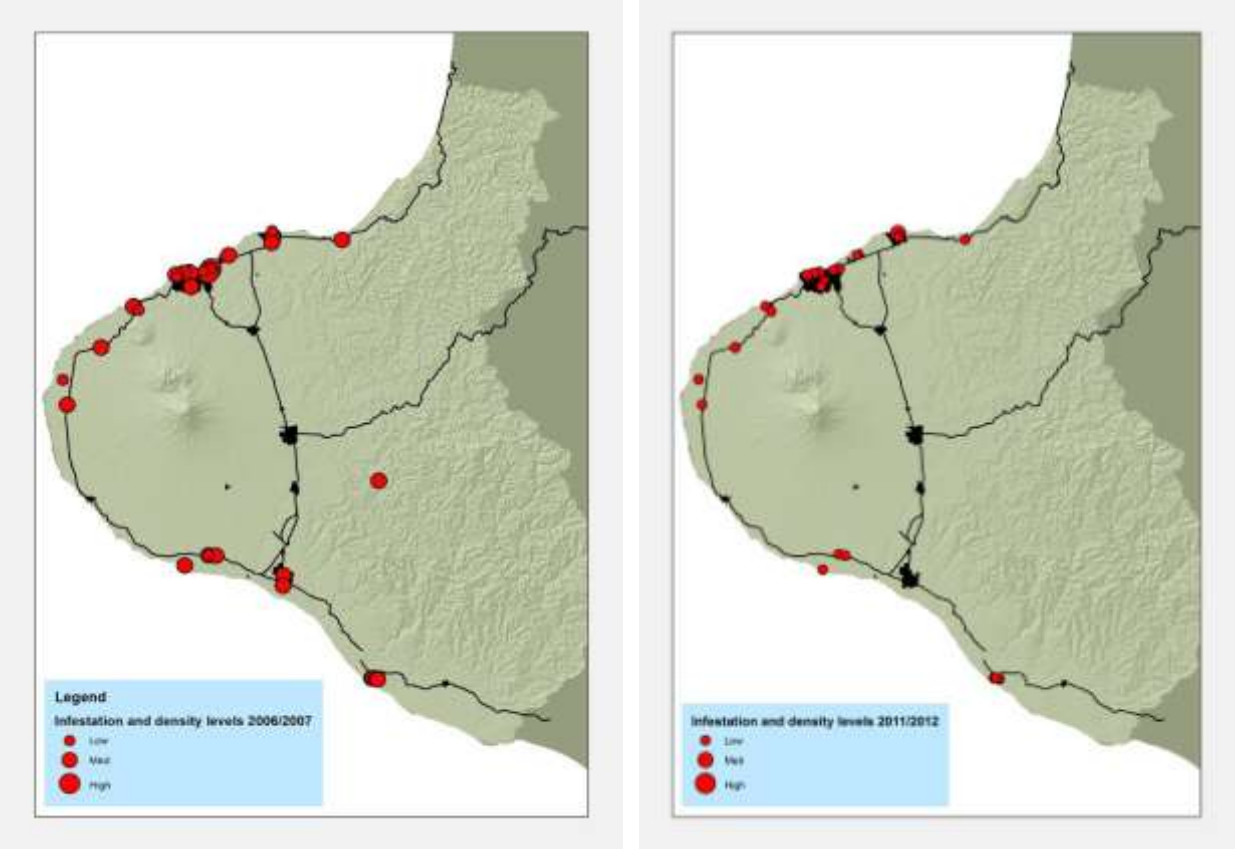

Figure 7 Mignonette vine infestation and density levels 2006/07 (above left) and 2011/12 (above right)

Disclaimer:

The Pampas maps below represent the sites visited by officers when a complaint or request for advice has been received during the financial year (i.e. 2006/2007 and 2011/12). They are indicative only of the 'problem' and do not represent the full distribution of the species.

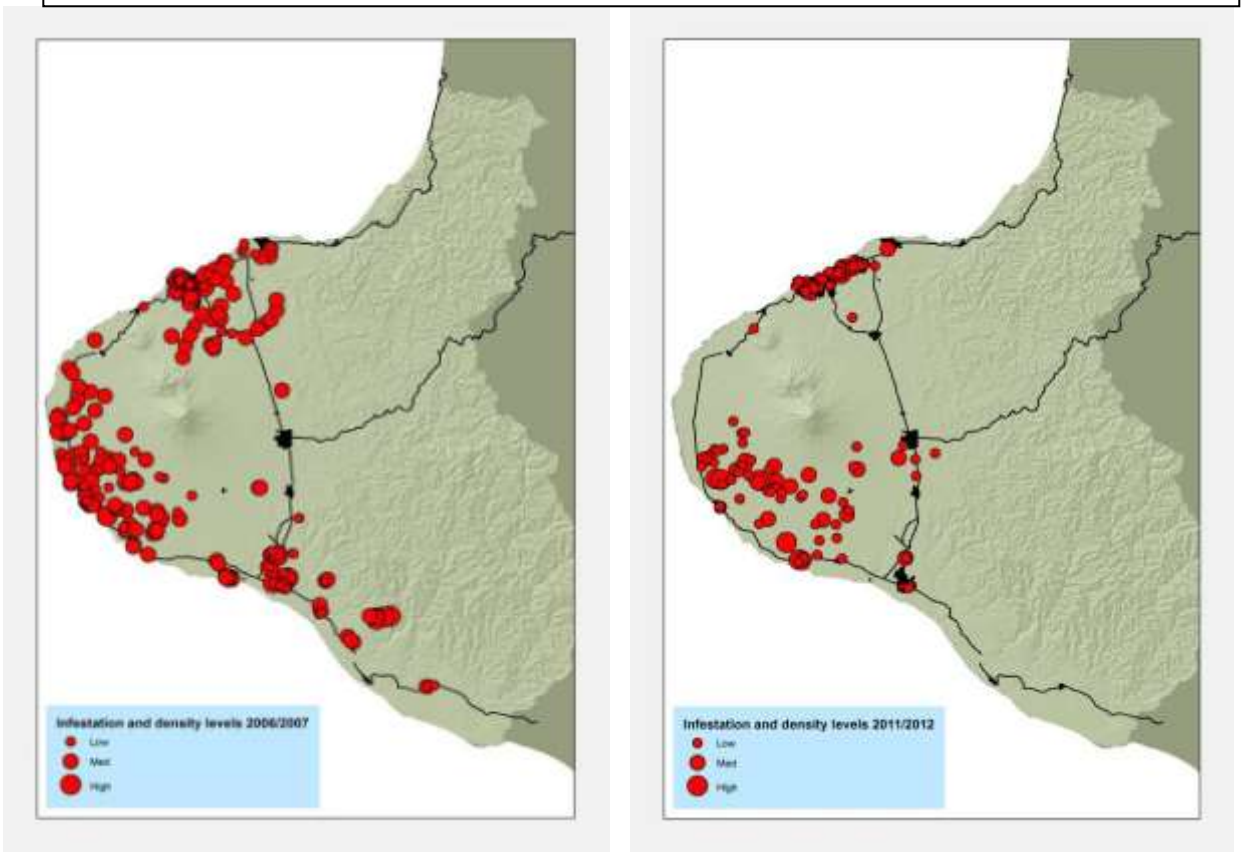

Figure 8 Pampas grass infestation and density levels 2006/07 (above left) and 2011/12 (above right)

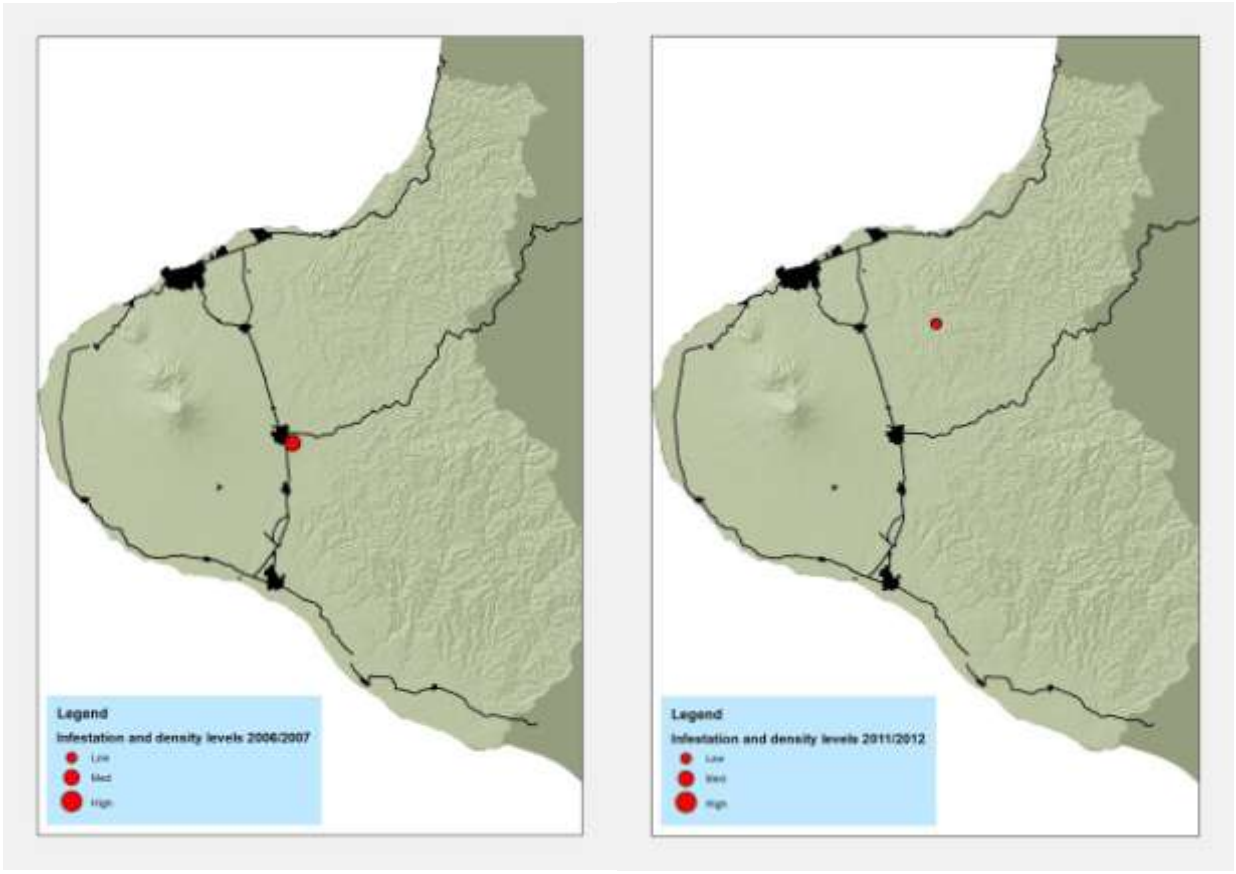

Figure 9 Senegal tea infestation and density levels 2006/07 (above left) and 2011/12 (above right)

3.3.2 Widespread pest plants

Over the life of the Strategy, the Council's management regime has been largely effective in managing the externality impacts of widespread pest plants for which strategy rules apply requiring land occupier to control the plants. These plants include established significant agricultural and conservation pest plants.

An analysis of trends showing Category C properties (properties identified through the inspection regime has having heavy infestations and for which land occupier rules apply) shows a reduction in 'problem' properties over time. Figure 10 below shows that after the adoption of the Council's second Strategy the number of Category C properties was relatively low, i.e. in the order of 80 to 120 properties. The 2006/2007 monitoring year saw a spike in the number of Category C properties in the Taranaki region. This spike was due to a shift in focus from agricultural pest plants such as ragwort, where compliance was generally high, to environmental pest plants such as old man's beard, giant gunnera, pampas and wild ginger. However, following that expanded focus at that time, the number of Category C properties has been steadily decreasing.

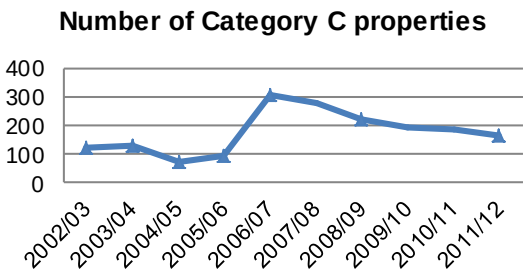

Figure 10 The number of Category C properties is steadily declining confirming increased compliance with Strategy rules.

With regards to giant gunnera, gorse, ragwort, giant buttercup and wild ginger, the distribution of these plant species remain widespread however the extent and densities of infestation appear to be being maintained at manageable levels. In many cases, infestation levels have been reduced over time.

Progress is being made towards treating heavy old man's beard infestations around the region, but this pest continues to be a significant threat to biodiversity and riparian programmes in the Waingongoro, Kaupokonui and Patea, and Mangatoki catchments. Biological control agents released at badly affected sites have had some success, but significant infestations remain and in these catchments infestations have worsened over time. It had been hoped that infestation levels in these catchments could have been reduced over the life of the Pest Plant Strategy with the possibility of land occupier obligations applying from the next Strategy review.

In relation to gorse there has been a substantial reduction in the areal extent of infestations in rural areas. However, increasingly Council's response to public complaints for gorse is being diverted to urban areas and the fringes-particularly New Plymouth.

Giant buttercup is currently restricted to certain dairying areas, especially in central northern Taranaki around Stratford, Inglewood and Egmont Village. While giant buttercup infestations do not seem to be spreading, an increasing resistance to herbicides has meant that requirements to undertake control can be problematic for the land occupier. Initial bio-control populations for giant buttercup have been established by the Council, but they have not proved to be an economically viable method of control. The lack of alternative control methods means that continuing with land occupier obligations might be unreasonable and needs to be reviewed.

Australian sedge, nodding, plumeless and variegated thistles to date do not appear to be of significant public concern. Most land occupiers appear to be maintaining infestations at manageable levels and/or adequately addressing externality impacts on their neighbours.

3.3.3 Other pest plants

For other species established in the region and for which no land occupier obligations apply (i.e. 'surveillance' species – brush wattle, woolly nightshade etc.) the Council has increasingly moved towards a site-led approach where the impacts are on regionally significant biodiversity values. The

widespread nature of these species makes control costly and in many places the public/private cost of control do not outweigh the benefits.

New plant species discovered during the life of the Strategy include an invasive marine pest, *Grateloupia turuturu*; and an invasive freshwater weed, hornwort *(Ceratophyllum demersum)*. Surveillance by Council staff has also noted the increasing prevalence of the shrub tutsan (*Hypericum androsaemum*), which can pose a threat to biodiversity, and a pasture weed, yellow bristle grass (*Setaria pumila*).

The merits of regional intervention for the management of 'new' species was assessed using the intervention logic model and the findings of those assessments are outlined in sections 4.3.5 and 4.4, and in the companion document to this working paper.

Set out in Table 3 below is a summary of Council's progress on achieving outcomes sought for pest plant management.

Table 3 Summary of progress: achieving pest plant outcomes

Pest		What do we want to achieve (current objective)?	Where are we at?	Conclusion
Eradication programmes	Climbing spindleberry	To eradicate all known infestations (as at 1 March 2007) of Climbing spindleberry in the Taranaki region by 2017 and, as far as practicable, destroy any new infestations of Climbing spindleberry that are identified over the life of the Strategy.	• Density of known infestations decreasing • 12 known sites	Target being met
	Darwin's barberry	To eradicate all known infestations (as of 1 March 2007) of Darwin's barberry in the Taranaki region by 2017 and, as practicable, destroy any new infestations of Darwin's Barberry that are identified over the duration of the Strategy.	• Species remains relatively widespread • Some infestations increasing in density • 63 known sites - mainly in the central Taranaki and hill country	Eradication target cannot be met
	Giant reed	To eradicate all known infestations (as of 1 March 2007) of giant reed in the Taranaki region by 2017 and, as practicable, destroy any new infestations of giant reed that are identified over the duration of the Strategy.	• Density of known infestations decreasing • 7 known sites	Target being met
	Mignonette vine	To eradicate all known infestations (as of 1 March 2007) of mignonette vine in the Taranaki region by 2017 and, as practicable, destroy any new infestations of mignonette vine that are identified over the duration of the Strategy.	• Number and density of known infestations decreasing • 53 known sites	Target being met
	Pampas Grass (common pampas, purple pampas)	To eradicate all known infestations (as of 1 March 2007) of common pampas and purple pampas in the Taranaki region by 2017 and, as practicable, destroy any new infestations of common and purple pampas that are identified over the duration of the strategy. To prevent the spread of common pampas and purple pampas used for hedgerows and shelterbelts in the Taranaki region up until 1 July 2012, and to eradicate all common and purple pampas used for hedgerows and shelterbelts (as at 1 July 2012) in the Taranaki region by 2017.	• Pampas is still widespread throughout the region • there has been considerable reduction in areas of infestation, especially in hedgerows and shelterbelts, but significant infestations still remain • Eradication technically not feasible.	Eradication target can not be met
	Senegal tea	To eradicate all known infestations (as of 1 March 2007) of Senegal tea in the Taranaki region by 2017 and, as practicable, destroy any new infestations of Senegal Tea that are identified over the duration of the Strategy.	• Species currently confined to 2 sites • Density of infestations decreasing	Target being met
	Undaria	To eradicate all known infestations (as of 1 March 2007) of *Undaria* in the Taranaki region by 2017 and, as practicable, destroy any new infestations of *Undaria* that are identified over the duration of the Strategy.	• Species confined to Port Taranaki • Infestation decreasing • Constant threat of reintroduction – pathways	Target being met

Pest		What do we want to achieve (current objective)?	Where are we at?	Conclusion
Containment programme	Australian sedge	To prevent the spread of, and where practicable, reduce infestations of Australian sedge in the Taranaki region for the duration of the Strategy	• 3 extensive infestations in Waitotara, smaller infestations in north Taranaki • Infestation levels may be increasing[9]	Target being met
	Giant buttercup	To prevent the spread of infestations of giant buttercup in the Taranaki region for the duration of the Strategy	• Species relatively confined to certain areas in Taranaki: • Infestation levels staying the same • Increasing resistance to the herbicide.	Target being met
	Giant gunnera (*Gunnera tinctoria* & *Gunnera manicata*)	To reduce the spread, and if practicable, reduce infestations of giant gunnera in the Taranaki region for the duration of the Strategy.	• Widespread in wetland, riparian and coastal areas • Number of known infestations decreasing.	Target being met
	Gorse	To prevent the spread of gorse from affected properties to neighbouring properties for the duration of the Strategy.	• Widespread throughout Taranaki • Infestation levels decreasing • Most complaints coming from New Plymouth and Bell Block urban areas.	Target being met
	Nodding thistle and Plumeless thistle	To prevent the spread of infestations of nodding and plumeless thistle for the duration of the Strategy.	• Species relatively confined in Taranaki • Generally low infestation levels being maintained	Target being met
	Old mans beard	To prevent the spread and, if practicable, reduce infestations of old man's beard in the Taranaki region for the duration of the Strategy To reduce heavy infestations of old man's beard in the Kaupokonui Stream, Patea River, and Waingongoro River through the release and distribution of biological control agents	• Heavy infestations in south and coastal areas • Infestation levels in other areas decreasing • No reduction in the infestation levels through biological control agents for the targeted river catchments	Target being met generally around the region. Target not being met for targeted catchments.
	Yellow ragwort	To prevent the spread of infestations of Ragwort and pink ragwort in the Taranaki region for the duration of the Strategy.	• Widespread throughout the region • Infestation levels decreasing	Target being met
	Pink ragwort	To prevent the spread of infestations of ragwort and pink ragwort in the Taranaki region for the duration of the Strategy.	• Pink ragwort confined to road reserves in south Taranaki	Target being met
	Variegated thistle	To prevent the spread of infestations of variegated thistle in the Taranaki region for the duration of the Strategy.	• Species relatively confined in Taranaki • Infestation levels decreasing	Target being met
	Wild broom	To prevent the spread and if practicable, reduce infestations of wild broom in the Taranaki region for the duration of the Strategy.	• Species relatively confined in Taranaki to Patea catchment • Infestation levels decreasing	Target being met
	Wild ginger (Kahili ginger, Yellow ginger)	To reduce known infestations of wild ginger in the Taranaki region over the duration of the Strategy.	• Species widespread throughout Taranaki • Infestation levels decreasing • Most complaints in New Plymouth urban area.	Target being met
Surveillance	Widespread species (Brush wattle, *Egeria*, Japanese walnut *Lagarosiphon*, Spanish heath, woolly nightshade)	To promote public understanding and gather information on the 'pest' characteristics of …. for the duration of the strategy.	• Being addressed through public information and, where appropriate, via site-led programmes	Targets being met

[9] *No complaints received for Australian sedge, therefore no inspections carried out to confirm the areal extent of infestations.*

3.4 Overview of the efficiency and effectiveness of current pest management programmes

Key findings for the review into the efficiency and effectiveness of current programmes set out in the pest animal and plant Strategies are that overall, the current Strategies are meeting or are on track to meet their targets for the majority of pests. There has been an overall decrease in areas with heavy infestations of pest animals and plants with assumed benefits that land productivity, capacity and versatility, biodiversity values and amenity values are being maintained and, in some places, increased.

However, for a small number of programmes, some fine tuning in terms of resources, priorities and objectives may be required to ensure the best regional outcomes are being achieved.

The results from the intervention logic model process (refer section 1.3 above), including the documentation of assumptions and retesting the logic behind programmes, have identified a number of potential changes to current pest management programmes to ensure that the community getting the 'best value' from the investments it is making and to ensure no unnecessary compliance costs are being imposed on land occupiers due to marginal benefits. Some themes for change to emerge from this review are as follows:

1. **Ensure benefits/outcomes of control are public and outweigh the costs**. The criterion for inclusion of a 'pest' in a pest management plan is clearly provided for in the Act[10]. However, some of the current pest management programmes may not fit these criteria. For example, Argentine ants being managed for largely their nuisance and amenity impacts. The underlying rationale for public intervention (particularly given it is not technically feasible to eradicate this species) and the resulting imposition of widespread compliance cost on landholders via the Pest Management Plan is questionable.
2. **Given the widespread nature of some pests, current objectives are unlikely to be achieved within the given time frame.** Control of widespread pests can be expensive, and requires significant effort to be effective. For pest plant species such as Darwin's barberry and pampas that are widespread, an eradication objective may be technically infeasible and or the benefits of regional intervention no longer exceed the benefits.
3. **For some programmes, efforts are focused in the wrong locations**. For example with gorse, the logic model process highlighted that the majority of the Council's inspectorial and enforcement services occur in urban areas. Given the desired intermediate outcome for gorse relates to agricultural production there is a strong case for a targeted programme that focuses on rural areas only, as opposed to diverting resources from higher priorities (e.g. eradication) so as to inspect a complaint for one or two individual plants on an urban property.
4. **Evaluation of the success (or otherwise) of each programme relies on the amount and quality of information available to confirm this assessment.** The development of key performance indicators, (in line with the National Performance Management Framework) is required to ensure success of programmes is monitored consistently and efficiently.

Proposed future directions addressing the findings above are addressed in section 4 below.

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[10] *Requirements for a subject's inclusion in a plan are that:*

(a) plant/animal is capable of having an adverse effect of regional significance
(b) benefits of their control outweigh the costs
(c) *benefits of control accrue principally to the region.*

4 Future directions for the management of pests in Taranaki

Proposed future directions for pest management programmes are outlined in the following section. The proposed future directions take into account potential change factors identified in sections 2 and 3 above.

Further information on the rationale and underlying assumptions for the proposals, including the findings from the application of the intervention logic model, is set out in the appended document; '*Intervention logic model worksheets*'.

4.1 Future directions – pest animals

In total, all 23 current pest management programmes included in the Pest Animal Strategy were considered using the intervention logic framework. No new candidate animal species were identified as requiring consideration for inclusion in a proposed *Pest Management Plan for Taranaki*.

In summary relatively few changes to current pest animal programmes were identified as being appropriate or necessary. Most proposed changes centred on giving effect to national directives relating to the setting of good neighbour rules, pest terminology and objectives and adopting a more site-led and targeted response to the management of some widespread species.

Key features for pest animal management programmes recommended for inclusion the proposed *Pest Management Plan for Taranaki* are as follows:

1. Continue with an exclusion programme for rooks
2. Continue to focus the majority of animal pest management efforts on possum control via the Self-help Possum Control Programme, continuing to focus on maintenance as opposed to extensions in the areal extent of the programme.
3. Develop good neighbour rules for possums (for properties in or adjacent to the Self-help Possum Control Programme) that apply to both private and Crown land occupiers
4. In relation to the occupiers of Crown land in or adjacent to properties in the Self-help Possum Control Programme, a good neighbour rule will require the occupiers to effectively control possums within one kilometre of the property boundary
5. Develop and implement an integrated 'halo' pest programme with appropriate agencies in the New Plymouth urban area to increase biodiversity values in targeted parks, reserves and walkways
6. Amend current management programmes for rabbits and Argentine ants from sustained control to site-led programmes
7. Adopt a site led approach to the management of other widespread invasive animal species –mustelids, feral cats, pest fish, brown hares, feral deer, feral goats, feral pigs, and magpies.

Table 4 overleaf summarises the key components of the proposed programmes, including the National Policy Direction's programme description, the recommended intermediate outcome (aim of programme) to be included in a proposed Plan, and whether good neighbour rules should apply. A brief explanation is also provided of the significance of any proposed changes including a summary of main assumptions made. The components of this analysis will feed into the process of drafting objectives and rules for the future Pest Management Plan.

Table 4 Animal species considered for inclusion in Plan

Pest species	Aim of programme (intermediate outcome)	Type of programme	Will good neighbour rules apply?	Explanation
Rooks	Exclude rooks from Taranaki and destroy any new infestations to avoid adverse impacts on indigenous biodiversity values	Exclusion	No	**No change** Of very limited distribution and not yet established in the region (no breeding population- only 2-3 individuals) The public benefits of preventing the establishment of rooks in the region significantly outweigh the costs Benefits of control principally accrue to the region rather than individual land occupiers
Possums	Reduce infestations of possums to reduce adverse externality impacts on indigenous biodiversity values and agricultural production.	Sustained control	Yes. Private land: applies to whole property within Self-help Programme. Crown land: applies within 1km of properties in the Self-help Possum Control Programme	**Minor change (good neighbour rule)** Widespread distribution - Self- help Possum Control Programme is effectively and sustainably keeping possum infestations levels at low level Programme is only sustainable on intensively farmed land (ring plain) The landholder is best placed to carry out control of possums One kilometre buffer distance for Crown land occupiers sufficient to address possum migration and associated externality impacts. without imposing unduly onerous requirements on the Crown.
European rabbits	Protect the biodiversity values of places of regional significance from adverse externality effects of European rabbits.	Site-led	No	**Significant change (no land occupier rule requiring control)** Widespread distribution with some parts of Taranaki being particularly rabbit prone Other than in association with KNEs, land occupier and other interested parties better placed to make decisions on necessity to undertake control Council has the relevant experience and expertise to provide advice and other assistance to facilitate voluntary control Public good benefits to contributing to direct pest control on KNEs for which biodiversity plans have been prepared, and large riparian plantings
Mustelids (stoat, ferret and weasel)	Protect the biodiversity values of places of regional significance from adverse externality effects of mustelids.	Site-led	No	**Minor change (new rule)** Other than in association with KNEs, land occupier and other interested parties better placed to make decisions on necessity to undertake control Council has the relevant experience and expertise to facilitate voluntary control Public good benefits to contributing to direct pest control on KNEs for which biodiversity plans have been prepared
Argentine ants	Protect the biodiversity values of places of regional significance and amenity values of residents in the Taranaki region from adverse externality effects of argentine ants.	Site-led	No	**Significant change (no land occupier rule requiring control)** Widespread throughout the region Land occupier generally better placed to make decisions on necessity to undertake control Council has the relevant experience and expertise to provide advice and support to facilitate voluntary control Reducing amenity/nuisance/ lifestyle impacts of argentine ants is primarily a private (rather than public) benefit.

Pest species	Aim of programme (intermediate outcome)	Type of programme	Will good neighbour rules apply?	Explanation
Pest fish (brown bull-headed catfish, koi carp, gambusia, rudd)	Protect the biodiversity values of places of regional significance from adverse externality effects of pest fish.	Site-led	No	**No change (Council continues to support DOC pest fish management programmes)** DOC lead agency responsible for pest fish management programmes Public good benefits to supporting DOC site led eradication/management programmes
Brown hare	Protect the biodiversity values of places of regional significance from adverse externality effects of brown hares.	Site-led	No	**No change** Widespread throughout dairy land Other than in association with KNEs, land occupier and other interested parties better placed to make decisions on necessity to undertake control Council has the relevant experience and expertise to provide advice and other assistance to facilitate voluntary control Public good benefits to contributing to direct pest control on KNEs for which biodiversity plans have been prepared, and large riparian plantings
Feral cat	Protect the biodiversity values of places of regional significance from adverse externality effects of feral cats.	Site-led	No	**No change** Other than in association with KNEs, land occupier and other interested parties better placed to make decisions on necessity to undertake control Council has the relevant experience and expertise to facilitate voluntary control Public good benefits to contributing to direct pest control on KNEs for which biodiversity plans have been prepared
Feral deer (red, sika, sambar, rusa, fallow, wapiti, white tailed deer)	Protect the biodiversity values of places of regional significance from adverse externality effects of feral deer.	Site-led	No	**No change** High density fallow deer in south Taranaki. Feral goats, pigs and magpies also widespread, particularly in eastern hill country Other than in association with KNEs, land occupier and other interested parties better placed to make decisions on necessity to undertake control Council has the relevant experience and expertise to facilitate voluntary control Public good benefits to contributing to direct pest control on KNEs for which biodiversity plans have been prepared
Feral goats	Protect the biodiversity values of places of regional significance from adverse externality effects of feral goats.	Site-led	No	
Feral pigs	Protect the biodiversity values of places of regional significance from adverse externality effects of feral pigs.	Site-led	No	
Magpies	Protect the biodiversity values of places of regional significance from adverse externality effects of magpies.	Site-led	No	

4.2 Future directions – pest plants

All 27 plant species currently declared to be pests in the Pest Plant Strategy were assessed. Four additional plant candidate species were also identified via the workshops as warranting further investigation on the appropriateness of regional intervention (yellow bristle grass, tutsan, *Grateloupia*, and hornwort).

In summary, this review has identified a relatively small number of proposed changes to current pest plant management programmes. Most proposed changes centre on giving effect to national directives relating to the setting of good neighbour rules. Other changes are proposed to fine tune objectives and or better target the outcomes sought to ensure targets are realistic and to ensure no unnecessary costs are being imposed on land occupiers (and ratepayers) where there are marginal benefits.

Key features for pest plant management programmes recommended for inclusion the proposed *Pest Management Plan for Taranaki* are as follows:

1. Continue with eradication programmes for species in their early stages of establishment in the region – these being; climbing spindleberry, giant reed, mignonette vine, and Senegal tea
2. Amend current management programmes for pampas grass and Darwin's barberry from an eradication to a sustained control programme
3. Amend current management programmes for *Undaria* from eradication to a site-led marine pathway programme
4. Include *Grateloupia* as a pest and address as part of the Council's site-led marine pathway programmes
5. Continue sustained control programmes, involving the implementation of an inspectorial and enforcement regime, for species established in the region and for which good neighbour rules are appropriate, these being: gorse (in rural areas only), old man's beard, nodding, plumeless, and variegated thistle, yellow ragwort, wild broom, and wild ginger
6. Does not include pink ragwort as plant pest.
7. Continues to identify and address brush wattle, *Egeria*, Japanese walnut, *Lagarosiphon*, Spanish heath and woolly nightshade through site-led programmes.

Table 5 overleaf summarises the key components of the proposed programmes, including the National Policy Direction's programme description, the recommended intermediate outcome (aim of programme) to be included in a proposed Plan, and whether good neighbour rules should apply. Unless specified, rules apply to both private and Crown land. An explanation is also provided that contains the main assumptions that the analysis is based on. The components of this analysis will feed into the process of drafting objectives and rules for the future Pest Management Plan.

Table 5 Plant species considered for inclusion in the Plan

Pest species	Aim of programme (intermediate outcome)	Type of programme	Will good neighbour rules apply?	Explanation
Climbing spindleberry	Eradicate all known and as far as practicable, destroy all newly discovered infestations of climbing spindleberry to avoid adverse impacts on indigenous biodiversity values	Eradication	No	**No change** Of very limited distribution Most known sites are located in urban areas Eradication is technically feasible over a 10 year timeframe The public benefits of preventing the establishment of these plants in the region significantly outweigh the costs Benefits of control principally accrue to the region rather than individual land occupiers The benefits of an eradication programme to be included in a Plan significantly outweigh the cost.
Mignonette vine	Eradicate all known and as far as practicable, destroy all newly discovered infestations of mignonette vine to avoid adverse impacts on indigenous biodiversity values	Eradication	No	
Senegal tea	Eradicate all known and as far as practicable, destroy all newly discovered infestations of senegal tea to avoid adverse impacts on indigenous biodiversity values	Eradication	No	
Giant reed	Eradicate all known and as far as practicable, destroy all newly discovered infestations of giant reed to avoid adverse impacts on indigenous biodiversity values	Eradication	No	
Grateloupia	Protect the biodiversity values of regionally significant marine areas from adverse externality effects of *Grateloupia*.	Site-led	No	**Significant change (new pest)** Limited distribution, but new incursions are a constant threat, and control is expensive and time intensive Eradication is technically infeasible due to threats of new incursions The public benefits of preventing the spread of this plants in the region significantly outweigh the costs
Undaria	Protect the biodiversity values of regionally significant marine areas from adverse externality effects of *Undaria*.	Site-led	No	**Minor change (revised objective)** Limited distribution, but new incursions are a constant threat, and control is expensive and time intensive Eradication is technically infeasible due to threats of new incursions The public benefits of preventing the spread of *Undaria* in the region significantly outweigh the costs
Pampas grass (common and purple pampas)	Prevent the spread of pampas to minimize any adverse externality effects on agricultural production and indigenous biodiversity values.	Sustained control	Yes. Applies to 100m or less from the boundary	**Minor change (revised objective and good neighbour rule)** Widespread distribution. Despite significant progress towards targets, eradication not technically feasible or necessary to address the widespread externality impacts of the plant The landholder is best placed to destroy pampas. 100m buffer distance sufficient to address biological spread of the plant and associated externality impacts.
Australian sedge	Prevent the spread of Australian sedge to minimize any adverse externality effects on agricultural production values.	Sustained control	Yes. Applies to 25m or less from the property in rural areas	**Minor change (focus on defined rural area on ly, good neighbour rule)** Limited distribution, primarily an issue for drystock properties Control can be expensive in comparison to the benefits, Can be difficult to identify from other sedges The landholder is best placed to destroy Australian sedge. 25m buffer distance sufficient to address biological spread of the plant and associated externality impacts.

Pest species	Aim of programme (intermediate outcome)	Type of programme	Will good neighbour rules apply?	Explanation
Giant buttercup	Prevent the spread of giant buttercup to minimize any adverse externality effects on agricultural production values.	Sustained control	Yes. Applies to 25m or less from the property boundary on the ring plain	**Minor change (good neighbour rule and revised boundary clearance rule)** Widespread in Stratford, Inglewood, Opunake areas. Giant buttercup very difficult and expensive to control, but has potential to spread through dairy and beef country Proven increasing resistance to herbicides The landholder is best placed to destroy giant buttercup. 25m buffer distance sufficient to address biological spread of the plant and associated externality impacts, rule applies to land on or adjacent to the dairying ring plain only.
Giant gunnera	Prevent the spread of giant gunnera to minimize any adverse externality effects on indigenous biodiversity values.	Sustained control	Yes. Applies to whole property	**Minor change (good neighbour rule)** Widespread throughout wetland/coastal/riparian areas, Rules necessary to address the widespread externality impacts of the plant The landholder is best placed to destroy giant gunnera Whole property addressed to prevent biological spread of the plant and associated externality impacts on neighbours.
Gorse	Prevent the spread of gorse to minimize any adverse externality effects on agricultural production values.	Sustained control	Yes. Applies to 25m or less from the property boundary, in rural areas	**Minor change (focus rules on defined rural area only, good neighbour rule)** Widespread throughout Taranaki Rules necessary to address the widespread externality impacts of the plant The landholder is best placed to destroy gorse Rule applies to Crown and private land in rural areas only. Focus on rural areas appropriate, not urban amenity (as it is currently) 25m buffer distance sufficient to address biological spread of the plant and associated externality impacts.
Old man's beard	Prevent the spread of old man's beard to minimize any adverse externality effects on indigenous biodiversity and riparian management values.	Sustained control	Yes. Applies to all of Taranaki (excluding specified catchments)	**Significant change (new self-help programme to target problem catchments, good neighbour rule)** Infestations overall are reducing but still significant problem in some catchments (Kaupokonui, Patea, Waingongoro) Self help control programme trial proposed in the Kaupokonui catchment. Once area is clear, rule for land occupier to maintain at low levels The landholder is best placed to destroy old man's beard.
Nodding thistles and plumeless thistles	Prevent the spread of nodding and plumeless thistle to minimize any adverse externality effects on agricultural production values.	Sustained control	Yes. Applies to 25m or less from the property boundary in rural areas.	**Minor change (focus on defined rural area only, good neighbour rule and revised boundary clearance rule)** Limited distribution of known infestations. The landholder is best placed to destroy nodding and plumeless thistles, however biological control is effective and spreading 25m buffer distance sufficient to prevent biological spread of the plant and associated externality impacts on neighbours.
Ragwort	Prevent the spread of ragwort to minimize any adverse externality effects on agricultural production values.	Sustained control	Yes. <u>Private land:</u> Applies to whole property on dairy land; 25m from boundary in eastern hill country <u>Crown land</u>: 25m from property boundary	**Minor change (good neighbour rule)** Widespread throughout Taranaki The landholder is best placed to destroy ragwort, numerous herbicides available for its control Whole property addressed on dairy land to prevent biological spread of the plant and associated externality impacts on pastoral production 25m buffer distance sufficient on Crown land and in the eastern hill country to address biological spread of the plant and associated externality impacts, without imposing unduly onerous requirements on the Crown, and hill country farmers.

Pest species	Aim of programme (intermediate outcome)	Type of programme	Will good neighbour rules apply?	Explanation
Variegated thistle	Prevent the spread of variegated thistle to minimize any adverse externality effects on agricultural production values.	Sustained control	Yes. Applies to 25m or less from the property boundary in rural areas.	**Minor change (focus on defined rural area only, good neighbour rule and revised boundary clearance rule)** Relatively confined distribution in Taranaki The landholder is best placed to destroy variegated thistle, relatively easy to control 25m boundary rule sufficient to prevent biological spread of the plant and associated externality impacts.
Wild broom	Prevent the spread of wild broom to minimize any adverse externality effects on agricultural production and biodiversity values.	Sustained control	Yes. Applies to 25m or less from property boundary	**Minor change (good neighbour rule)** Relatively confined distribution in Patea catchment. Most infestations occur in waste areas, roadsides or poorly grazed pasture. The landholder is best placed to destroy wild broom 25m buffer distance sufficient to address biological spread of the plant and associated externality impacts.
Wild ginger (kahili and yellow ginger)	Prevent the spread of wild ginger to minimize any adverse externality effects on biodiversity values.	Sustained control	Yes. Applies to whole property	**Minor change (good neighbour rule)** Widespread in Taranaki, especially in urban areas The landholder is best placed to destroy wild ginger Easy to control (herbicides are effective), but difficult to eradicate Whole property addressed to prevent biological spread of the plant and associated externality impacts.
Darwin's barberry	Prevent the spread of Darwin's barberry to minimize any adverse externality effects on biodiversity values.	Sustained control	Yes. Applies to 150m or less from property boundary.	**Minor change(revised objective and good neighbour rule)** Species becoming increasingly widespread in Taranaki. Problem largely in waste areas and along roadsides The land holder is best placed to destroy Darwin's barberry 150m boundary rule sufficient to prevent biological spread of the plant and associated externality impacts.
Brush wattle	Protect the biodiversity values of places of regional significance from adverse effects of brush wattle.	Site-led	No	**No change** Terrestrial plants widespread, aquatic plants relatively confined to a few lakes but very difficult to control Other than in association with KNEs, land occupier and other interested parties better placed to make decisions on necessity to undertake control Council has the relevant experience and expertise to facilitate voluntary control Public good benefits to contributing to direct pest plant control on KNEs for which biodiversity plans have been prepared.
Egeria	Protect the biodiversity values of places of regional significance from adverse effects of *Egeria*.	Site-led	No	
Japanese walnut	Protect the biodiversity values of places of regional significance from adverse effects of Japanese walnut	Site-led	No	
Lagarosiphon	Protect the biodiversity values of places of regional significance from adverse effects of *Lagarosiphon*.	Site-led	No	
Spanish heath	Protect the biodiversity values of places of regional significance from adverse effects of Spanish heath.	Site-led	No	
Woolly nightshade	Protect the biodiversity values of places of regional significance from adverse effects of Woolly nightshade.	Site-led	No	

4.3 Key changes proposed

Changes from the current strategies to that proposed for the revised *Pest Management Plan for Taranaki* range from the inclusion of good neighbor rules, changes in programme objectives and rule requirements to the exclusion of current species/inclusion of new species. Outlined below is a discussion of key changes recommended for the proposed Plan.

4.3.1 Inclusion of good neighbour rules.

The amendments to the Biosecurity Act have significantly altered the position of the Crown in relation to regional pest management plans. It is proposed that the Crown be required to comply with any 'good neighbour rules' under the revised *Pest Management Plan for Taranaki*.

As indicated in tables 4 and 5 above, good neighbour rules are proposed for the following sustained control programmes:

- possums
- pampas grass (common and purple pampas)
- Australian sedge
- giant buttercup
- giant gunnera
- gorse
- old mans beard
- nodding thistles and plumeless thistles
- yellow ragwort
- variegated thistle
- wild broom
- wild ginger (kahili and yellow ginger)
- Darwin's barberry.

Good neighbour rules recognise that effective pest control is dependant upon measures also being undertaken on neighbouring properties. Good neighbour rules therefore require a landowner to control a pest to a level or within a 'buffer' distance as specified within the rule, primarily to respond to externalities rather than pest management itself.

The provisions of the proposed good neighbour rules, including what is an appropriate buffer distance, will be confirmed through the public process for the review of the strategies. They will be similar in kind to existing land occupier obligations. However, pursuant to section 56(3) of the BSA, the

NPD – the setting of good neighbour rules

a) In the absence of the rule, the pest would spread to land that is adjacent or nearby within the life of the plan and would cause unreasonable costs to an occupier of that land

b) In determining whether the pest would spread as described in (a), the regional council must consider the proximity and characteristics of the adjacent or nearby land and the biological characteristics and behaviour of the particular pest (the greater the distance between properties, the more difficult to satisfy the test in (a)

c) The land that is adjacent or nearby, as described in (a), must be clear from the pest, or, if the pest is present on that land, the occupier of that land must be taking measures to manage the pest or its impact

d) The rule must not set a requirement on an occupier that is greater than required to manage the spread of the pest

e) In determining the rules to be set to manage the costs to an occupier of land that is adjacent or nearby, of the pest spreading, the regional council must consider:

i. The biological characteristics and behaviour of the particular pest; and

ii. Whether the cost of compliance with the rule are reasonable relative to the costs that such an occupier would incur, from the pest spreading, in the absence of a rule.

Council must be satisfied of the following matters in subclause (a), (c) and (d) and must comply with the requirements in subclause (b) and (e) of the draft proposed National Policy Direction. [11]

Table 6 overleaf introduces an example of what a good neighbour rules for possums and ragwort might look like having particular regard to the requirements of the National Policy Direction.

[11] *Determining the correct buffer distance can be a challenge due to the mobility of pest animals and the variable dispersal rates of pest plants and their impacts on different land uses.*

Table 6 Example of good neighbour rule setting for possums and ragwort

Species	Checklist of NPD requirements a-e	Proposed good neighbour rule
Possums *(Trichosurus vulpecula)*	a) **Yes**. Significant potential costs are possible through re-infestation of properties in and adjacent to the Self-help Possum Control Programme, which results in significant added pasture browse, increased infection risk, degradation of vegetative condition of remnant ecosystems, and increased compliance/control costs. b) **Yes**. Possums primarily disperse through juvenile dispersal, with 90% dispersing within 1 kilometre. However, home range movement in response to habitat and food needs also occurs. Within 1 kilometre potentially significant costs likely on dairying and drystock properties, on retired and vegetated riparian margins on the ring plain, or where site specific biodiversity protection programmes are occurring. c) **Yes**. Properties in the Self-help Possum Control Programme are actively managing possums and keeping possum infestation levels on average at 3.3% RTC. d) The rule will not require management in areas one kilometre beyond the boundary of areas being actively managed via the Self-help Possum Control Programme. e) i) **Yes**. Home range movement is unlikely to be beyond 1km beyond the boundary of the area being protected. ii) **Yes**. Regular and timely control of possums to a 10% Residual Trap Catch will reduce spread to neighbouring properties at a reasonable cost.	In relation to private land[12], every land occupier in the Self-help Possum Control Programme shall effectively control brushtail possums on that land. In relation to Crown land[13] within one kilometre of land within the Self-Help Possum Control Programme, the administering agency shall effectively control[14] possums on that land to below 10% RTC. A breach of these rules are an offence under section154N(18) of the Biosecurity Act 1993.
Yellow ragwort *(Jacobaea vulgaris)*	a) **Yes.** Significant potential costs are possible to dairying properties on the ring plain and coastal terraces, which includes reduced pasture production, and toxicity to stock (localised nuisance effects for other land uses). b) **Yes.** Ragwort is primarily wind dispersed, however 99% of seeds fall within 14 metres of the parent plant. Ragwort can also be spread by water and animals, and in hay. Large plant can produce 150,000 seeds/season, therefore all plants need to be controlled where it may spread to neighbours. c) **Yes**. Ragwort being actively managed on majority of properties across the ringplain. d) **Yes.** A neighbour not dairying is not required to actively manage ragwort, good neighbour rules do not apply. e) i) **Yes.** Dispersal further than 25m is unlikely as seeds fall near plant. ii) **Yes.** Regular and timely control involving the destruction of all juvenile and adult plants will prevent spread to neighbouring properties at a reasonable cost.	In relation to private land west of the line, every land occupier must destroy all juvenile and adult forms of ragwort on that land that he or she occupies. In relation to Crown land, and private land east of the line (eastern hill country), every land occupier must destroy all juvenile and adult forms of ragwort located 25 metres or less from the boundary of that land that he or she occupies. A breach of these rules are an offence under section 154N(18) of the Biosecurity Act 1993.

[12] *Private land is defined as land in private ownership (land not managed by the Department of Conservation or other public body)*

[13] *Crown land is defined as land owned and managed by the government (eg the Department of Conservation, Land Information New Zealand or New Zealand Transport Agency).*

[14] *Effectively control means to kill, cause to kill, or otherwise dispose of possums and to reduce population levels on a property to 10% RTC or below.*

Case study: Crown obligations and the Self-Help Possum Programme

High possum numbers in the bush/pasture margin of the Egmont National Park impose significant, external and uncompensated costs on the Taranaki Regional Council and local land occupiers in terms of added costs associated with addressing possum re-infestation. These added costs threatened the long term viability of the Self-help Possum Control Programme on farmland in that area.

Throughout the life of the Strategy, the Taranaki Regional Council has developed a good working relationship with the Department of Conservation to develop collaborative control and monitoring programmes to maintain low possum numbers along the Park boundary. The Department maintains an on-going control programme, and responds to any areas the Council has identified as a concern.

In the new Plan, under the requirements of the amended Act, the Crown will be bound to a 'good neighbour rule' for controlling possums to an acceptable level within one kilometre of the Park boundary.

4.3.2 Change of management focus for Argentine ants, rabbits, Darwin's barberry, pampas, *Undaria* and giant buttercup

Argentine ants (*Linepithema humile*)

It is proposed to remove the rule requiring land occupiers to control Argentine ant infestations. Argentine ants will continue to be identified as a regional pest however the management approach will change from an inspectorial and compliance regime to a site led approach. The Council will continue to carry out public education, enabling access to poison suppliers, and carrying out site-led control where appropriate.[15]

Intensive monitoring over the duration of the Pest Animal Strategy confirms that Argentine ants are now well established throughout urban areas in the region.

The Councils effort's at promoting public awareness and providing advice and information have been effective, however the highly invasive and increasingly widespread nature of the species makes it difficult and costly to control. Around New Zealand, other regional councils have not succeeded in containing Argentine ant infestations. Land occupier rules are now considered unduly onerous given the land occupier is generally better placed to decide if and when they will carry out control.

Rabbits (*Oryctolgus cuniculus*)

It is proposed to remove the rule requiring land occupiers to control rabbit infestations. Rabbits will continue to be identified as a regional pest however the management approach will change from an inspectorial and compliance regime to a site led approach. The Council will continue to carry out public education, enabling access to bait suppliers, and carrying out site-led control where appropriate.

Over the life of the Strategy, there have been an insignificant number of complaints and enquiries received with regards to the management of rabbit infestations. Monitoring confirms that rabbit populations remain widespread throughout 'rabbit prone land' in the region. However, there is an opportunity to reduce compliance costs on land occupiers by adopting a more targeted (site-led) approach. It recognises that land occupiers are generally better placed to decide if and when they will carry out control.

Darwin's barberry (*Berberis darwinii*)

It is proposed that the Council no longer seek to eradicate Darwin's barberry and instead address the species via a sustained control programme in the revised *Pest Management Plan for Taranaki*. A sustained control programme will involve the Council applying a compliance regime to ensure land occupiers manage the externality impacts of the plant on neighbouring land.

Despite some progress reducing the distribution of the Darwin's barberry in known areas, additional infestations have been identified with the species now known to be more widespread. The current eradication objective sought for Darwin's barberry has become an increasingly difficult objective to achieve and may no longer be a cost effective

[15] *This proposal gives effect to the Council's agreement on 19th November 2009 to shift the focus for Argentine ants from enforcement to the provision of advisory, education and identification services.*

priority for the region given the widespread nature of the pest in Taranaki.

The cost of controlling already established or widespread species incurs significant costs, and the public benefit for doing so is questionable for this species. Darwin's barberry is a problem largely in waste areas and along roadsides. So far it is not believed to be having significant adverse effects on biodiversity or agricultural production values. Furthermore, Himalayan barberry, (*Berberis glaucocarpa*) is an ecologically similar species that has been used widely as a hedging plant throughout the region, and is not causing significant problems that warrant its inclusion in the Plan.

Pampas (*Cortaderia selloana, Cortaderia jubata*)

It is proposed to change the management focus for pampas from an eradication programme to a sustained control programme.

The effect of the proposed change is actually quite minor. There is no change in the Council's *modus operandi*. The Council will continue to apply a significant inspectorial and compliance regime to ensure land occupiers manage the externality impacts of the plant on neighbouring land and the associated impacts on agricultural, forestry and biodiversity values. The only change is in the management objective which is currently to eradicate the plant from the region.

Pampas is clearly established and widespread in the region, therefore the eradication outcome sought for pampas grass is not achievable and technically unfeasible. It is proposed that the Council adopts a sustained control programme for pampas in the new Plan.

Undaria (*Undaria pinnatifida*)

It is proposed to change the management focus for *Undaria* from an eradication programme to a site-led pathway control programme.

As with pampas, the effect of the proposed change is actually quite minor. There is no change in the Council's *modus operandi*. The Council will continue to annually survey and destroy any *Undaria* infestations in Port Taranaki so as to prevent the establishment of the plant and it being spread along marine pathways to the Sugar Loaf Islands and other coastal sites of significance.

The change in management objective /programme recognises the difficulty of eradicating *Undaria* due to the constant risk of re-invasion from ships travelling from other parts of New Zealand.

Through a site-led pathway programme, the Council will continue to carry out surveillance and direct control of *Undaria*, to ensure that infestations of this pest are maintained at low levels, and risk of new invasions are minimised and addressed in a timely fashion.

Giant buttercup (*Ranunculus acris*)

It is proposed to amend the rule requiring land occupiers to control giant buttercup infestations to a standard buffer distance across the region.[16]

Giant buttercup will continue to be identified as a regional pest and will continue to be addressed via an inspectorial and compliance regime. However, confining the effect of the rule to a buffer distance is considered appropriate having particular regard to the tests to be met for setting good neighbour rules under the National Policy Direction.

Giant buttercup is a relatively localised problem on dairy land in Stratford, Inglewood, Opunake and Mangatoki. While infestations do not appear to be spreading the control of the plant is problematic for affected farmers as control is proving to be difficult, and increasing resistance to herbicides has been proven.

Of note a set buffer distance (e.g. 25 metres from property boundary) should be sufficient to address the externality impacts of the plant as the seed is heavy and tends to drop close to the parent plant.

4.3.3 Delineating urban/rural boundaries

It is proposed to delineate urban boundaries that will be linked to programme objectives and rules to ensure programmes and any good neighbour rules are addressing the causes and rationale for regional intervention.

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[16] *Currently in some parts of Taranaki (the ring plain) a land occupier is required to control any infestation, anywhere on your property, irrespective of distance from property boundary and having an impact on neighbour properties.*

The intervention logic process highlighted that the inspectorial and enforcement regime for some plants, is focussed in the wrong locations. Urban inspections, particular in response to public complaints for gorse, represent a disproportionate amount of total inspections by the Council (around 90%). In the case of gorse, it was clear that the majority of complaints are generated by neighbouring residential properties for amenity and aesthetic reasons despite the rationale for regional intervention for gorse being its impact on agricultural production values.

The proposed *Pest Management Plan for Taranaki* will include good neighbour rules (and maps) for agricultural production pest plants that are confined to rural areas, or for certain parts of the region, eg the ring plain or eastern hill country.

4.3.4 New flagship programmes

Three new flagship programmes are proposed to be included and implemented along side the revised *Pest Management Plan for Taranaki*. These relate to a surveillance strategy, an urban possum halo project and a targeted self-help catchment programme for old man's beard. A description of these proposals is provided below.

Surveillance strategy and programmes

The cost of mitigating pest impacts increases as pests move across borders (both nationally and regionally) and subsequently become established.

It is a well established pest management principle that early detection and response represents the most cost effective management response. Hence the need for a focus on prevention, early detection and eradication.

To date, surveillance programmes are undertaken by a plethora of parties via a number of programmes. In the case of the Council, there are a number of surveillance programmes targeting plant nurseries, Port Taranaki and some lakes. However, generally there is a reliance on other organisations such as the Ministry of Primary Industries and the Department of Conservation and on public reportings of new organisms.

Over the life of the next Plan it is proposed to develop a surveillance strategy to promote a more pro-active approach to reducing the risk of new organisms establishing in the region. This will involvement an assessment of risks and potential pathways for the arrival of new organisms.

The risk assessment would be the first step in developing targeted surveillance and response programmes to be designed to ensure all avenues are appropriately managed, and public awareness is raised of the potential risk organisms to look out for. This process will involve liaison with key partners such as the Ministry of Primary Industries, plant nurseries, farm machinery operators, Port Taranaki, and the Councils of neighbouring regions.

Urban possums – New Plymouth 'Halo' extension programme

The Self-help Possum Control Programme has proved to be an effective way of managing possums to low levels on the ring plain, through empowering land owners to carry out control. With the vast majority of the ring plain now encompassed by the Self-help Possum Control Programme, there are opportunities to extend into new areas.

The New Plymouth District Council currently carry out possum, predator and rat control in public parks and reserves. The Taranaki Regional Council is proposing to complement and build onto this programme by liaising with and empowering the private landowners adjoining these parks, reserves and walkways to carry out possum control on a voluntary basis.

The halo programme is based on similar programmes in the Waikato and Hawkes Bay, which have been successful in encouraging public involvement and engagement in biodiversity generally. Increases in abundance in native bird species has been observed in Hawkes Bay, with the abundances of kereru, tui and bellbird increasing by over 50% over the five years following control. These results can be attributed to increased predator control in these areas. Applying a similar programme to urban areas in Taranaki is an opportunity to promote biodiversity generally in an urban setting.

Old man's beard self-help programme

Old man's beard is a significant threat to the biodiversity of native bush and riparian margins in the Taranaki region.

Currently land occupier rules requiring the control of old man's beard exclude the Kaupokonui, Patea and Waingongoro catchments given high infestations present in these catchments and the exorbitant and unreasonable cost that this would impose on land occupiers.

However, over the duration of the Pest Plant Strategy, infestations in these catchments appear to be getting worse. To the extent that, if left unchecked, old man's beard is likely to spread through riparian margins and threaten the Riparian Management Programme. Besides undermining Council and farmer investment in the retirement and planting of riparian margins in these catchments, the consequence is a degradation of water quality and biodiversity outcomes.

It is proposed that the Council carry out a self help control programme for old man's beard, similar in kind to that adopted for possums. This would involve the Council undertaking initial control to reduce infestations to a manageable level whereby the land occupier can then assume responsibility for the on going maintenance.

Initially, 28km of the Kaupokonui catchment will be targeted to test control methods, and test its wider application for the other aforementioned catchments. The programme would involve staff undertaking a significant direct control operation, public education campaign, and landowner training. After initial control, landowners will be bound to a good neighbour rule to control infestations on their property.

4.3.5 New pest to be included in the Plan - *Grateloupia turuturu*

It is proposed that a new invasive marine species be included in the revised *Pest Management Plan for Taranaki* and addressed via a site-led pathway programme.

Grateloupia was discovered at two localised sites within Port Taranaki in the winter of 2011 by a NIWA/MAF survey. *Grateloupia* poses a threat to biodiversity values through competition with native algae, and altering habitat composition for other species living in the marine environment.

The Council proposes to annually survey and destroy any *Grateloupia* infestations in conjunction and as part of the *Undaria* programme undertaken in Port Taranaki so as to prevent the establishment of the plant and it being spread along marine pathways to the Sugar Loaf Islands and other coastal sites of significance.

As with *Undaria*, the management approach recognises the difficulty of eradicating marine species due to the constant risk of re-invasion from ships travelling from other parts of New Zealand.[17]

Through a site-led pathway programme, the Council will ensure that infestations of this pest are maintained at low levels, and risk of new invasions are minimised and addressed in a timely fashion.

4.3.6 Pest to be excluded from the Plan - pink ragwort (*Senecio glastifolius*)

The Council proposes to remove pink ragwort from the revised *Pest Management Plan for Taranaki*, as the plants limited distribution currently has a negligible effect on agricultural production. Pink ragwort was paired with yellow ragwort (*Jacobaea vulgaris*) in the current Pest Plant Strategy.

The biological and pest characteristics of pink ragwort are not considered to be as significant as that of yellow ragwort and therefore do not warrant regional intervention. Stock eat pink ragwort, and are able to maintain infestations at low levels, whereas yellow ragwort is poisonous to stock, and can easily spread when left unchecked.

The Council will continue to provide advice and information on the control of pink ragwort.

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[17] *Control of Grateloupia is problematic due to the difficulty of differentiating this species from other red coloured native seaweeds. The Council will be liaising closely with MPI and DOC in design and implementation of this programme.*

4.4 Other species considered and rejected for inclusion in the Plan

Four plant species not currently identified as pests were considered for inclusion in the proposed *Pest Management Plan for Taranaki* during the logic model workshops. One – *Grateloupia* – was recommended for inclusion (refer section 4.3.5 above). The other three, these being hornwort, yellow bristle grass and tutsan were not considered to have a strong enough case to warrant regional intervention. The estimated cost of including these species in the Plan is provided in appendix I.

The findings and recommendations of the workshops for additions considered are summarised below:

- **Hornwort *(Ceratophyllym demersum):*** Hornwort was first discovered the Taranaki region in Lake Rotorangi in April 2012. Hornwort is a highly invasive aquatic plant that has the potential to negatively impact freshwater quality, aquatic biodiversity values, and recreational use. As the weed is highly invasive, it could easily be spread by recreational users to other lakes in the region. Trustpower commissioned NIWA to conduct a study of Lake Rotorangi in June 2012 and concluded that the pest was not likely to have a significant effect on hydro-electric power generation.

  Due to the size of the infestation within the lake, eradication is not achievable, and could cost up to one million dollars. A programme for the purpose of keeping boat ramps clear would also be costly, and not guaranteed to prevent spread to other lakes. Therefore, the Council does not consider direct control or a regulatory approach to be cost effective.

  Changes have been made to the Council's state of environment monitoring programme to include monitoring and surveillance for hornwort and other aquatic weeds. The Council will focus on promoting public awareness and education on practices to avoid the spread of such weeds. For example the Council participates in the Check Clean Dry summer campaign, which targets recreational users to encourage them to take measures to avoid the spread of hornwort, didymo, and other freshwater pests.

- **Yellow bristle grass *(Setaria pumila):*** Yellow bristle grass is an annual summer grass which is invading pastures from roadside infestations, via stock movement, and in hay/silage. Infestations have been identified at Urenui, Tikorangi, Motonui, Lepperton, Inglewood, Okato and Manutahi.

  The majority of infestations appear to be on roadsides and waste ground. Therefore the Council does not consider direct control or a regulatory approach to be necessary or appropriate.

  Farmers and road controlling authorities are considered to be better placed to consider if and when they should control yellow bristle grass. However, the Council may still provide an advisory and educational role to promote weed hygiene and prevent the spread of the plant.

- **Tutsan/sweet amber *(Hypericum androsaemum):*** tutsan is a shrub with the capacity to form extensive patches exceeding one hectare in size. Its dense cover of branches and its rotting leaves can smother existing low growing plant communities and inhibit regeneration.

  Currently, tutsan is largely restricted to waste areas and road cuttings, especially in the eastern hill country, and is not presently posing a significant threat to agricultural production or biodiversity values sufficient to warrant regional intervention, although it has the potential to cause significant effects on a localised scale.

  The Council does not consider direct control or a regulatory approach to be cost effective. Farmers and road controlling authorities are considered to be better placed to consider if and when they should control tutsan. However, the Council may still provide an advisory and educational role to promote weed hygiene and prevent the spread of the plant.

5 Summary

The Council has begun the process of reviewing its current pest management strategies for animals and plants.

This paper represents a starting point for early engagement and targeted consultation with key stakeholders prior to the Council publicly notifying a proposed *Pest Management Plan for Taranaki*. To inform discussions, the Council outlines policy change factors, examines the effectiveness and efficiency of the current strategies (and lessons learnt) and presents proposals for consideration in a revised plan.

This paper notes that collectively both strategies address fifty animal and plant species and imposes significant compliance costs on many land occupiers to protect a plethora of values in addition to the costs incurred by the regional community to fund programmes.

In the preparation of this paper the Council has applied Landcare Research's Intervention Logic Model to assist in evaluating current pest programmes and designing future programmes. As part of that process assumptions and the rationale for regional intervention have been tested and documented.

This paper identifies a number of policy drivers for change – mostly as a result of amendments to the Biosecurity Act, and the upcoming promulgation of the National Policy Direction. As a result, consequential changes to the next *Pest Management Plan for Taranaki* are inevitable.

Of particular note is the imposition of good neighbour rules that are binding on the Crown as well as private land occupiers and which should improve pest management generally in the region.

While this paper has identified some areas of change, it is not as if the Council needs to start from scratch. This paper confirms that the Council's pest animal and plant programmes are largely on track and achieving the outcomes sought. Indeed the implementation of programmes in the current strategies has been efficient and effective. However, over the last ten years, as with any programme, some areas have been highlighted where change is appropriate or where resources could be better focused.

Set out below is a summary of the key proposals recommended for inclusion in the proposed *Pest Management Plan for Taranaki*:

Animals

1. Continue with an exclusion/eradication programme for rooks
2. Continue to focus the majority of animal pest management efforts on possum control via the Self-help Possum Control Programme
3. Develop a good neighbour rule for possums (for properties in or adjacent to the Self Help Possum Control programme) that applies to private land occupiers
4. In relation to the occupiers of Crown land in or adjacent to properties in the Self-help Possum Control Programme, a good neighbour rule will require the occupiers to effectively control possums within one kilometre of the property boundary
5. Develop and implement an integrated 'halo' pest programme with appropriate agencies in the New Plymouth urban area to increase biodiversity values in targeted parks, reserves and walkways
6. Adopt a site led approach to the management of widespread invasive animal species – rabbits, Argentine ants, mustelids, feral cats, pest fish, brown hares, feral deer, feral goats, feral pigs, and magpies.

Plants

1. Continue with eradication programmes for species in their early stages of establishment in the region – these being; climbing spindleberry, giant reed, mignonette vine, and Senegal tea
2. Amend current management programmes for pampas grass and Darwin's barberry

from eradication to a sustained control programme

3. Amend current management programmes for *Undaria* from eradication to a site-led marine pathway programme
4. Include *Grateloupia* as a pest and address as part of the Council's site-led marine pathway programmes
5. Continue sustained control programmes, involving the implementation of an inspectorial and enforcement regime, for species established in the region and for which good neighbour rules are appropriate, these being: gorse (in rural areas only), old man's beard, nodding, plumeless, and variegated thistle, yellow ragwort, wild broom, and wild ginger
6. Do not include pink ragwort as plant pest, instead addressing the pest on a site-led basis outside of the plan.
7. Continues to identify and address brush wattle, *Egeria*, Japanese walnut, *Lagarosiphon*, Spanish heath and woolly nightshade through site-led programmes.

Definition of terms

Activities, in relation to the intervention logic model, are the actual interventions undertaken by agencies to achieved specified outputs.

Aquatic, in relation to plants and animals, are those that live in either fresh or salt water.

Eradication means to reduce the infestation level of the subject to zero levels in an area in the short to medium term.

Exclusion means to prevent the establishment of the subject that is present in New Zealand but not yet established in an area.

Externality impacts, in relation to pest management, are adverse and unintended effects imposed on others. Such impacts are often called 'third party effects'.

Inputs, in relation to the intervention logic model, are the resources (such as capital, personnel) required to produce outputs to achieve desired outcomes.

Intermediate outcomes, in relation to the intervention logic model, refer to a specified intermediate state that feeds into an outcome.

Intermediate outcome measures, in relation to the intervention logic model, are measures of the difference made by the delivery of outputs. These measures focus on effectiveness.

Intervention logic model refers to the framework used to describe a programme as a linear sequence of components, typically inputs, activities, outputs and outcomes; to uncover underlying assumptions to reveal why an intervention is expected to lead to a particular result.

Land occupier ,in relation to any place physically occupied by any person, means that person; and; in relation to any other place, means the owner of the place; and; 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

Methods, in relation to the intervention logic model, are activities are made up of a number of methods, e.g. trapping.

Monitoring, in relation to the intervention logic model, is a measurement of change in a natural environment, e.g. the abundance and distribution of weed and pest populations over time.

Outcomes, in relation to the intervention logic model, refers to the description of state or change in state of a condition of significance to the system or community resulting from a combination of agency interventions and external factors.

Outcome indicators, in relation to the intervention logic model, are measures of the prevailing state in a given period for a specific component of the system or community.

Outputs, in relation to the intervention logic model, are the goods or services that are produced by the agency.

Output performance measures, in relation to the intervention logic model, provide information on efficiency of operations.

Pathway programme, is where the intermediate outcome for the programme is to reduce the spread of harmful organisms.

Pest means an organism specified as a pest in a pest management plan

Pest management plan is a regional pest management plan prepared under part 5 of the Biosecurity Act which is for the eradication or effective management of nuisance plant and animal species.

Progressive containment means to contain and reduce the geographic distribution of the subject to an area over time.

Site-led control means that the subject that is capable of causing damage to a place is excluded or eradicated from that place, or is contained, reduced, or controlled within the place to an extent that protects the values of that place.

Sustained control means to provide for the sustained control of the subject in an area to a level where the costs imposed on persons are manageable.

Terrestrial, in relation to plants and animals, are those that live on the land

Appendix I: Costs of pest management

As part of this review into the effectiveness and efficiency of the Council's pest management strategies, the cost of current and proposed programmes was estimated. These estimations will help inform the preparation of the cost benefit analysis, required by the Act to ensure that the benefits of each programme outweigh the costs.

In addition, Council officers involved in the administration and implementation of the strategies were surveyed and their views canvassed on the administration and compliance costs of the Plan.

Cost of pest management programmes

The cost of each pest management programmes varies depending on the level of intervention required. Table 7 and 8 below give an indication of the estimated cost of current programmes, and the estimated cost of the programmes proposed in this paper. These figures were calculated by estimating the amount of staff time required to carry out the job (in 'full time equivalent' terms (FTE), as well as the associated costs such as vehicles, ACC levies etc[18]. Commentary is provided to explain any increase or decrease in expenditure.

Table 7 Estimated cost of current and proposed pest management programmes in the Plan: Animals

Proposed Programme	Candidate animal species	Estimated cost of current programme ($)	Estimated cost of proposed programme ($)	Comments
Eradication	Rook	5000	5000	
Sustained control	Brush-tail possum	1,338,000	1,250,000	Decrease due to initial control ending
Site-led	Argentine ant	32,000	6000	Shift to site-led programme
	Brown bull-headed catfish	0	0	Not yet present in Taranaki
	Brown hare	48000	48,000	
	European rabbit	48,000	48,000	Shift to site-led programme, maintenance of current monitoring
	Feral cat	16,000	16,000	
	Feral deer	2000	2000	
	Feral goat	48,000	48,000	
	Feral pig	2000	2000	
	Koi carp	250	250	
	Magpie	16,000	16,000	
	Gambusia	1500	1500	
	Mustelids	48,000	48,000	
	Rudd	250	250	
	TOTAL	1,605,000	1,491,000	Difference of $114,000 – to assist with pest plant management programmes.

[18] *For the purposes of this exercise, one FTE equals $120,000 of expenditure.*

Table 8 Estimated cost of current and proposed pest management programmes in the Plan: Plants

Proposed programme	Candidate plant species	Estimated cost of current programme ($)	Estimated cost of proposed programme ($)	Comments
Eradication	Climbing spindleberry	8000	10,000	Increased resources to focus on direct control programmes
	Mignonette vine	8000	10,000	
	Senegal tea	2000	6,000	
	Giant reed	5000	6,000	
Sustained control	Pampas grass	52,000	70,000	Continue increased regulatory focus on pampas
	Australian sedge	500	500	
	Darwin's barberry	5000	3000	Decrease due to shift of programme from eradication to sustained control.
	Nodding thistle	7000	7000	
	Old man's beard	62,000	110,000	Increase due to proposed self help initial control programme targeting the Kaupokonui catchment
	Plumeless thistle	7000	7000	
	Ragwort	163,000	165,000	
	Pink Ragwort	2,000	0	Proposed to be removed from Plan
	Giant buttercup	7000	25,000	Increased focus on enforcing 25m boundary rule
	Giant gunnera	7000	25,000	Increased focus appropriate
	Gorse	40,000	20,000	Decrease due to focus on rural properties (rather than urban)
	Variegated thistle	7000	7000	
	Wild broom	7000	7000	
	Wild ginger	18,000	18,000	
Site-led	Japanese walnut	500	500	
	Brush wattle	500	500	
	Lagarasiphon oxygen weed	500	500	
	Egeria oxygen weed	1000	1000	
	Spanish heath	500	500	
	Undaria	8000	8000	
	Grateloupia	0	3000	Proposed to include in plan as extension to the Undaria programme.
	Woolly nightshade	500	500	
	TOTAL	419,000	511,000	

Inclusion of new programmes

The inclusion of new programmes requires careful consideration. Table 9 overleaf details the estimated cost for pests considered to be included in the plan. Based on the 2012/13 Annual Plan (provided that there is no income from direct charges), an increase of expenditure of $73,000 results in a 1% rate increase for ratepayers.

Table 9 Estimated annual cost of including programmes for species considered for inclusion in the Plan

Candidate species	Estimated annual cost of including programme in Plan ($)	Comments
Hornwort	50,000- could be up to 41,000,000	A lower cost programme would provide for external contractors, for the purpose of keeping the boat ramp clear. However, this approach is unlikely to prevent spread of the species to other lakes. A more expensive programme would provide for a greater level of on-going control. However, eradication is not a feasible option.
Yellow bristle grass	40,000- 72,000	For a 25m boundary rule
Tutsan	15,000 - 18,000	A lower cost programme would provide for a programme focussed on responding to complaints and providing information. A more expensive programme would provide for a dedicated monitoring and surveillance programme.

Administration costs

Administration costs are the costs incurred by Council to implement the regulatory and non-regulatory methods of the Plan.

Non recoverable administrative costs are incurred by the Council. As noted in Table 10 overleaf, Council has evaluated the administrative costs associated with the regulatory provisions of the Pest Plant Strategy, and rated these as moderate. This is based on the relatively large number of pest plant species for which land occupier obligations apply and the need for the inspectorial and enforcement regime to target a large number of properties in any given year.

In relation to enforcing the provisions of the current Pest Animal Strategy, the administrative costs are assessed as being low due to the limited number of pest animal species for which land occupier obligations apply and the relatively low number of enforcement incidents needing to be followed up. Of more significance, are the non recoverable administrative costs incurred by Council in facilitating and supporting land occupier control of possums through the Self-help Possum Control Programme. Six point seven (6.7) FTEs are involved in the delivery of the Self-help Possum Control Programme on the ring plain. The total cost of delivering this part of the Programme is approximately 1.4 millon dollars per annum. This represents a significant investment by the Council; however, the costs are low in comparison with the nett environmental benefits and the benefits of co-ordinated possum control over Taranaki's intensively farmed land.

Other non recoverable costs incurred by the Council in administrating the strategies relate to policy and planning costs associated with the preparation of the strategies, monitoring and reviewing the implementation of the strategies (including annual reporting), responding to public enquiries and complaints, and general advocacy. It is estimated that about 0.6 of an FTE would be spent on such activities across the life of the strategies.

Compliance costs

Compliance costs are the costs incurred by land occupiers to comply with rules in the *Pest Management Strategy for Taranaki: Animal*s and *Pest Management Strategy for Taranaki: Plants* (e.g. costs associated with physical works and chemicals required to control pest animals and plants).

For most land occupiers, physical works are carried out as part of their normal on-farm/land management practices. Farm monitor reports note that the cost of weed and pest control for the 'average' dairy farm is $2300[19] and $4648[20] for sheep and beef farms. There has been no significant increase in costs over the duration of the strategies.

[19] *MPI National Dairy Farm Monitoring Report, Taranaki 2012*

Table 10 Assessment of costs of implementing current pest animal and plant strategies[21]

Type of costs	Measures	Evaluation			Comments
		Low	Moderate	High	
Administrative cost (costs incurred by Council to administer the strategies & implement non-regulatory methods)	Enforcement actions taken under the Pest Plant Plan		√		0.01 of a FTE. On average 0 incidents per annum
	Enforcement actions taken under the Pest Animal Plan	√			0.01 of a FTE. On average 0 incidents per annum consenting activities under the Plan
	Costs incurred by Council to deliver Self-help Possum Control Programme		√		6.7 FTE delivering Self-help Possum Control Programme in the ring plain. Total cost for delivering this part of the Programme is approximately $1,400,000 per annum
	Biological control programmes (pest plants only)	√			0.04 of an FTE. Approximately $2,000 spent per annum. $22,000 to National Biocontrol Collective.
	Direct control programmes for pest plants (eradication)	√			0.2 of an FTE mostly on eradication programmes. Approximately $10,000 spent per annum
	Direct control programmes for pest plants(site led)	√			Approximately spent per annum 0.1 FTE most for site-led (biodiversity) programmes.
	Other non-chargeable costs incurred by Council to deliver non-regulatory methods	√			0.6 of an FTE delivering advocacy, & policy development, monitoring & reporting activities
Compliance costs (costs incurred by private land occupiers to comply with regional rules)	The cost of physical works required to comply with Strategy rules		√		For most land occupiers, physical works are carried out as part of their normal on-farm/land management practices. Farm monitor reports note that the cost of weed and pest control for the 'average' dairy farm is $2300 and $4648 for sheep and beef farms. There has been no significant increase in costs over the duration of the strategies.
Other economic costs (broader costs associated with Plan constraining production & innovation, or resulting in the sub –optimal allocation of resources)	Constraints imposed by strategies limiting resource users' flexibility to achieve environmental results anticipated	√			Strategy rules should not unnecessarily constrain production. Net benefits anticipated from regular pest and weed control
	Production constraints placed upon targeted sectors	√			Strategy rules should not unnecessarily constrain production. Net benefits anticipated from regular pest and weed control
	Constraints imposed by Plan that limit new entrants to a sector or industry, or limit resource use flexibility	√			Strategy rules should not unnecessarily constrain production. Net benefits anticipated from regular pest and weed control

[20] *Beef and Lamb economic service- sheep and beef farm survey, Taranaki/Manawatu 2012*

[21] *Table 7 is based upon a matrix set out in Enfocus report 'Evaluating Regional Policy Statements and Plans' (2008).*

Type of costs	Measures	Evaluation			Comments
		Low	Moderate	High	
	Constraints impose by Plan by the lack of certainty given to existing or potential new resource users about what they can do & how they manage resources	√			Strategy rules should not unnecessarily constrain production. Net benefits anticipated from regular pest and weed control
Overall economic cost of Plan provisions		√			Just over two million dollars per annum, spent by Council in the administration and implementation of both strategies. For most land occupiers, physical works are carried out as part of their normal on-farm/land management practices. Farm monitor reports note that the cost of weed and pest control for the 'average' dairy farm is $2300 and $4648 for sheep and beef farms. There has been no significant increase in costs over the duration of the strategies.