

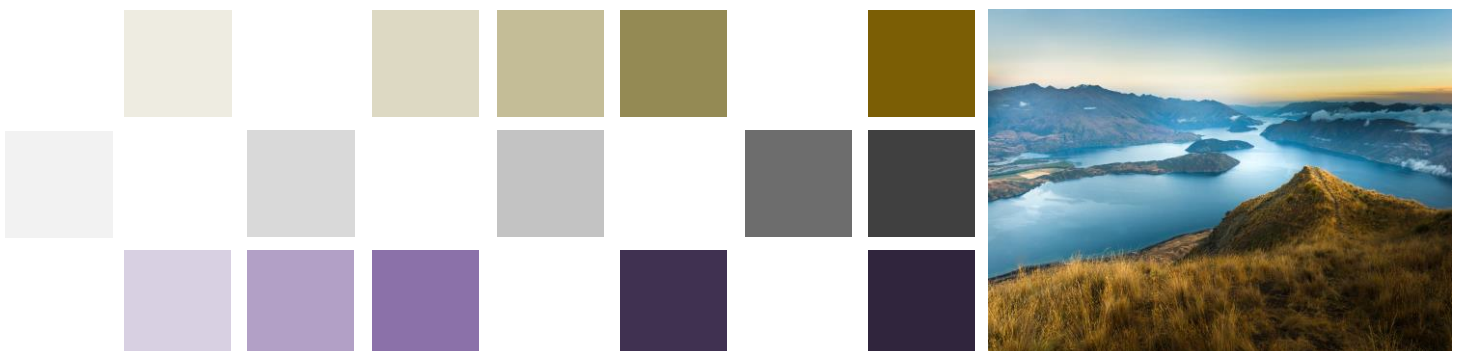
# Review into the effectiveness of the Otago Regional Pest Management Plan

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Evaluation Report

Dr Julius Ohrnberger, Lockie Woon, Dr Jamie O’Hare,  
Leané de Beer, Sally Wyatt

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## Glossary

<b>Abbreviation</b>	<b>Stands for</b>
AI	Artificial intelligence
ArcGIS	Arc Geographic Information System
CBA	Cost-benefit analysis
DOC	Department of Conservation
eDNA	Environmental DNA
FMU	Freshwater Management Unit
FTE	Full-time equivalent
FY	Financial year
GABFA	Gorse and broom free area
GPS	Global positioning system
ICMP	Integrated catchment management programme
IDI	Integrated data infrastructure
IGS	Infestation grading scale
KPI	Key performance indicator
LINZ	Land Information New Zealand
MMS	Modified McLean Scale
MPI	Ministry for Primary Industries
NGO	Non-governmental organisation
NoD	Notice of Direction
NPD	National Policy Direction for Pest Management 2015
ORC	Otago Regional Council
OSPRI	Operational Solutions for Primary Industries
RPMP	Regional Pest Management Plan (Otago)
SSPM	Small-scale management programmes
Wall-IS	Wallaby information system

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## Executive summary

Otago Regional Council (ORC) has contracted Sapere to provide an interim effectiveness evaluation of the Regional Pest Management Plan (RPMP) in Otago. The RPMP is a 10-year operational plan for 51 pest species in the Otago Region and was introduced in November 2019. The 2019 version expanded the scope of the 2009 plan, providing additional detail to the task of pest management in the region, and introducing new categories, rules, and programmes.

The report is guided by the principal question:

How 'on-track' is ORC to deliver the objectives of the Otago RPMP, and how effective is it in this endeavour?

### ORC is partially effective in achieving pest objectives stated in the RPMP

We have assessed the effectiveness of ORC in meeting each of the pest objectives stated in the RPMP. For the assessment, we have triangulated data from stakeholder interviews, primary and secondary data sources, and ORC reports and documents. Our assessment shows that overall partial effectiveness of ORC inputs, activities, outputs and outcomes has been achieved to date. The table below highlights the pest-specific findings. We define effectiveness as follows:

1. **Effective:** ORC is currently meeting pest objectives and is likely to continue doing so at the end of the current RPMP.
2. **Partially effective:** progress towards pest objectives, but further changes are required to ensure full effectiveness by the end of the RPMP.
3. **Not effective:** current approaches are not sufficient in meeting objectives and changes are required to meet the objectives at conclusion of the current RPMP.
4. **Inconclusive:** insufficient information to make a confident assessment of the current effectiveness in meeting pest objectives.

Table 1: Effectiveness by programme and pest

Pest programme	Pest type	Effectiveness
<b>Exclusion</b>	<i>African feather grass, Chilean needle grass, egeria, false tamarisk, hornwort, moth plant</i>	<b>Effective</b>
<b>Eradication</b>	<i>Rooks, spiny broom</i>	<b>Effective</b>
	<i>Wallaby</i>	<b>Effective</b> in raising awareness <b>Not effective</b> in reducing populations and preventing spread
<b>Progressive containment</b>	<i>Spartina</i>	<b>Effective</b>
	<i>Wilding pines (includes 10 species), African love grass, Nassella tussock</i>	<b>Partially effective</b>

<b>Pest programme</b>	<b>Pest type</b>	<b>Effectiveness</b>
	<i>bomarea, and old man's beard</i>	<b>Not effective</b>
	<i>Boneseed, bur daisy, cape ivy, perennial nettle, white-edged nightshade</i>	<b>Inconclusive</b>
<b>Sustained control</b>	<i>Feral rabbits</i>	<b>Partially effective</b>
	<i>Gorse and broom, Russell lupin</i>	<b>Not effective</b>
	<i>Nodding thistle, ragwort</i>	<b>Inconclusive</b>
<b>Site-led</b>	<i>Lagarosiphon</i>	<b>Partially effective</b>
	<i>Otago Peninsula</i>	<b>Partially effective</b>
	<i>West Harbour – Mt Cargill</i>	<b>Partially effective</b>
	<i>Quarantine and Goat Island</i>	<b>Inconclusive</b>

### **RPMP aspects where ORC is effective in achieving stated objectives**

Pest-specific aspects are outlined in detail in the report. Overlapping themes indicate that ORC's effectiveness is driven by investments in data capture technology, improved staffing levels for biosecurity functions, and increased funding to support programme delivery. Additionally, targeted funding has been provided for specific species such as rooks and spartina, as well as for pest management initiatives at site-led programs, including lagarosiphon control and possum management on the Otago Peninsula.

Effective activities include targeted education campaigns for rooks and wallabies, which have notably enhanced public awareness. Cross-boundary collaboration with Environment Canterbury and Southland has also improved. ORC's role in providing oversight and bringing together engaged stakeholders has contributed to successful pest management efforts, particularly on the Otago Peninsula.

Targeted monitoring by ORC has demonstrated effective outcomes, especially in controlling rooks, spartina, and spiny broom. In wilding pine management, ORC has achieved partial effectiveness by leveraging national funding support. While ORC's wallaby population control efforts are not effective at present, their collaboration with the national wallaby programme has yielded promising results. Initiatives such as the Judas wallaby trials have contributed to developing targeted and cost-effective control measures.

### **RPMP aspects where ORC is not effective in achieving stated objectives**

Pest-specific aspects and recommendations are outlined in detail in the report. Less effective aspects of ORC's current approach to achieving RPMP objectives relate to how funding is used, following a reactive pest management approach. Success has been achieved at site-led programmes, but some

stakeholders note the short-term nature of ORC-provided funding poses a risk to long-term outcomes.

A key challenge to the effectiveness of the RPMP is limited public awareness. ORC has effectively communicated issues relating to rooks and wallabies, however, stakeholder interviews indicated that overall understanding of the RPMP, its rules, and landowner responsibilities remains low. The lack of awareness reduces the RPMP's impact. A limited communication budget and the complexity of the lengthy RPMP document further hinder engagement and compliance.

Monitoring and inspections are currently concentrated on a small number of pests, notably rabbits, bomarea, and old man's beard. This narrow focus places considerable pressure on ORC's resources. While the targeted monitoring of certain species has yielded positive results, a more balanced approach covering a wider range of pests could enhance effectiveness.

While ORC has successfully implemented processes for re-inspections of non-compliant properties since the inception of the current RPMP, such as accurate data capture of these properties, it is important to build on these improvements to further strengthen its compliance efforts. Re-inspections of non-compliant properties are a key area to enhance compliance efforts. Expanding re-inspection efforts would support stronger compliance outcomes. Further, increasing the number of new (first-time) inspections is important to ensure timely identification and follow-up of non-compliant properties.

Enforcement has been deprioritised, weakening the overall impact and effectiveness of the RPMP. Data shows lack of follow-through on Notices of Direction (NoDs), which have been sparsely used by ORC. At present, there are no consequences for non-compliance, which undermines the credibility and effectiveness of ORC's inspections, re-inspections, the NoDs issued, and the overall achievement of RPMP objectives.

### Summary of effective and less effective ORC RPMP efforts

We summarise in Table 2 the effective and less effective aspects of ORC's implementation of the RPMP using key elements of the RPMP programme logic: ORC inputs, activities, outputs, and outcomes.

Table 2: Effective and non-effective ORC RPMP efforts

	Effective aspects	Less effective aspects
Inputs	<p><b>Investment in technology:</b> the use of tools such as GIS mapping and the improved data collection system (Survey123) are significant improvements made by ORC. Improvements in the data system led to more consistent reporting and permitted before-and-after comparison of pest management efforts by landowners/occupiers.</p> <p><b>Investment in staff:</b> ORC has made investment in their staff, creating</p>	<p><b>Funding and prioritisation challenges:</b> while funding increases have been made, stakeholders report limited capacity for enforcement, monitoring, and proactive pest management. This suggests the challenge may lie not only in funding levels, but also in how resources are prioritised and allocated.</p> <p><b>Funding use:</b> stakeholders reported an inefficient use of resources by ORC, targeted towards a reactive rather than proactive pest management approach. This limits the effectiveness of resources</p>

	Effective aspects	Less effective aspects
	<p>additional biosecurity and managerial roles to support the programme.</p> <p><b>Increased total RPMP funding uplift:</b> funding for the RPMP was increased to support the delivery of the programme.</p> <p><b>Targeted funding for specific initiatives:</b> dedicated funding streams for pests, such as rooks, spartina, wilding pines, or on the Otago Peninsula for site-led programmes led to success in pest control.</p>	<p>used. Stakeholders also highlighted challenges in short-term funding for community or site-led projects requiring long-term support to achieve sustainable outcomes.</p> <p><b>Transparency and inclusivity:</b> stakeholders, including iwi, noted insufficient transparency in budget allocation to pest management initiatives of the RPMP (e.g. pest programmes and pests), and a lack of prioritisation for Māori, but also among NGOs.</p> <p><b>Lack of RPMP spending understanding:</b> a challenge in ORC's current accounting system does not permit specific tracking of RPMP-related expenditures, hampering an appropriate assessment and clear indication of where the money is spent.</p> <p><b>Limited spending on communicating the RPMP:</b> ORC has set aside a limited amount of funding to engage with the public to create awareness. However, creating awareness is a key success factor for RPMP effectiveness.</p>
Activities	<p><b>Education campaigns:</b> public education campaigns, such as those targeting wallabies, pest of the month specifically for rooks, or targeted campaigns in regional areas for rabbits or predator-free initiatives, have improved awareness and encouraged individual action in rural areas.</p> <p><b>Cross-boundary collaboration:</b> partnerships with council groups, like Environment Canterbury, are supporting pest management efforts relevant to controlling cross-boundary pests such as wallabies.</p> <p><b>Oversight:</b> several examples exist where ORC provided oversight and brought together stakeholders, such as on the Otago Peninsula at site-led programmes, demonstrating successful pest management.</p> <p><b>Targeted monitoring:</b> where ORC provided targeted monitoring, success can be achieved, for example relating to spiny broom and rook eradication, or</p>	<p><b>Limited communication:</b> the communication budget is limited and the RPMP document is lengthy and hard to read. The lack of communication of the RPMP rules strongly reduces awareness of the plan, and landowner/occupier responsibilities. This is a critical point and causes an inefficiency of the RPMP.</p> <p><b>Monitoring and inspection approach:</b> current inspections have a strong focus on specific pests (i.e. rabbits, bomarea, and old man's beard), which is likely driven by the rules of the RPMP (i.e. good neighbour rules and requirements to act) and by public awareness of pests; both increase the responsibility for ORC for inspections. This binds resources.</p> <p>While we acknowledge ORC's efforts to enhance monitoring, we want to highlight the opportunity to expand monitoring to other pests in high-biodiversity areas. ORC has made significant progress in this regard, particularly with old man's beard, by prioritising high-biodiversity areas for targeted monitoring.</p>

	Effective aspects	Less effective aspects
	lagarosiphon.	<b>Re-inspections and new inspections:</b> ORC can improve in conducting re-inspections, which are limited at present. Increasing the number of new (first-time) inspections is also important to ensure timely identification and follow-up of non-compliant properties.
Outputs	<p><b>Localised species control:</b> success stories include rook eradication, and lagarosiphon management in Lake Wanaka and Lake Wakatipu. The latter relates to strong community efforts with oversight from ORC.</p> <p><b>Increased community participation:</b> education-first approaches have led to greater involvement in local initiatives controlling possums.</p>	<p><b>Lack of enforcement:</b> there is low prioritisation of enforcement and thus ORC is not meeting its targets as shown in our analysis. Furthermore, stakeholders noted that the lack of enforcement risks their efforts and time invested in managing pests according to the plan in their local areas.</p> <p><b>Follow-up to non-compliance:</b> there is limited enforcement post non-compliance. While NoDs were issued, at present there has been no follow through consequences for non-compliance to NoDs.</p> <p><b>More visibility needed:</b> outputs are required to show the public success stories of how funding is used and how the RPMP affects pest management efforts, potentially creating more community buy-in.</p>
Outcomes	<p><b>Targeted successes:</b> targeted inputs, oversight, and clear monitoring led to success in rook eradication efforts, an effective and positive trajectory of spiny broom and spartina control. Where site-led programmes were empowered by funding and by oversight from ORC, success in pest management was achieved, for example in possum eradication on the Otago Peninsula or at West Harbour – Mt Cargill. Furthermore, national funding support is enabling success in developing approaches to enable improved wallaby pest management. These success stories reflect the potential of well-funded, collaborative efforts.</p> <p><b>Enhanced awareness in some areas:</b> specific outreach efforts have led to improved understanding of pests among some rural landowners.</p>	<p><b>Broader systemic issues:</b> systemic issues, like reinfestation of rabbit populations in localised areas around Queenstown and between Queenstown, Luggate and Wanaka, or gorse and broom issues fragmented efforts, and lack of enforcement limits broader progress towards an effective RPMP delivery.</p> <p><b>Limited awareness of and compliance to the RPMP:</b> community groups, urban and lifestyle block landowners remain largely unaware of their responsibilities under the RPMP, which limits compliance but also the buy-in of the community. There is a general unawareness of the RPMP among the public as reported by stakeholders.</p>

## Recommendations to enhance the effectiveness of the current RPMP

Pest-specific recommendations are outlined in detail in the report. Three common areas for improvement have emerged from our programme level assessment, in order of priority:

1. Raise public awareness of the RPMP in Otago.
2. Prioritise compliance activity to improve public compliance to RPMP rules in Otago.
3. Improve current approach to monitoring and surveillance of RPMP pests.

Recommendations for each are listed in Table 3.

Table 3: Recommendations for priority areas

<b>Raise public awareness</b>	<b>Improve public compliance</b>	<b>Improve monitoring/surveillance</b>
<ul style="list-style-type: none"> <li>• Simplify the RPMP presentation, accessibility and reach</li> <li>• Clarify rules and target communication to key audiences</li> <li>• Improve transparency to and motivation of public by sharing more success stories</li> </ul>	<ul style="list-style-type: none"> <li>• Initially, target enforcement efforts where investments and awareness are already in place (i.e. old man’s beard, rabbits, bomarea, wilding pines). Also consider prioritisation of areas with highest biodiversity or economic/cultural value.</li> <li>• Communicate more clearly the consequences of non-compliance following inspections, while also highlighting success stories resulting from enforcement efforts.</li> <li>• Utilise powers under the Act of default work and cost recovery in cases of repeated non-compliance.</li> <li>• Leverage data to optimise enforcement efforts.</li> <li>• Increase the number of new and re-inspections. Consider targeting areas with highest biodiversity or economic/cultural value first. <i>Note: this should be accompanied by appropriate enforcement activities (i.e. default work and cost recovery) as inspections alone will have limited impact without follow-through.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Fill data gaps by leveraging citizen science and integrating stakeholder data.</li> <li>• Incentivise the public to contribute data where gaps are present.</li> <li>• Consider introducing outcome-based monitoring.</li> <li>• Invest in capacity and capability by utilising tools such as AI-enabled traps, drones, and remote sensing; additionally, provide training for biosecurity staff.</li> <li>• Prioritise efforts where data gaps are most significant, focusing first on areas with the highest biodiversity or economic/cultural value.</li> </ul>

## Recommendations to guide the next RPMP

### Improve good neighbour rules

Effectiveness could be enhanced by revising the good neighbour rules, particularly in relation to wilding pines, rabbits, and gorse and broom.

- Current rules for wilding pines apply only within a 200-metre boundary, which stakeholders widely consider to be ineffective. A revised good neighbour rule should increase this distance; stakeholders have suggested a range of 2 to 3 kilometres to reflect the actual spread risk.
- For rabbits, effectiveness could be improved by requiring landholders to respond with at least an equivalent level of control to that undertaken by a neighbouring property that has successfully met its Modified McLean Scale (MMS) target. This would help ensure a coordinated and fair approach to rabbit management.
- Regarding gorse and broom, stakeholders recommended extending the application of good neighbour rules beyond rural areas to include peri-urban or lifestyle areas where these pests also pose challenges.

### Good neighbour rules would further benefit from revision to improve equity and outcomes.

- Stakeholders have expressed concern that while private landowners are required to meet RPMP obligations, adjacent public land may not be subject to the same requirements, with ORC having limited ability to enforce compliance.
- The next RPMP should explicitly address these compliance gaps by clarifying the responsibilities of public land and strengthening ORC's enforceability of good neighbour rules on public land.

### Expand pest scope

We further suggest that expanding the RPMP to pests that are currently not included in the RPMP (marine pests) and beyond site-led programmes (possums, goat, deer).

### On a programme level, ORC could improve the effectiveness as follows:

- Improving data to improve RPMP effectiveness
- Investing in new or refining existing site-led programmes

*ORC could further consider a shift in pest-management, which requires further testing, as follows:*

- An integrated pest management approach, leveraging catchment action plans.

Specific recommendations and suggestions for each are presented in the table below.

Table 4: Recommendations and suggestion for the next RPMP

<b>Recommendation</b>		<b>Suggestion</b>
<b>Improving data to improve effectiveness</b>	<b>Refining scope and extending the number of site-led programmes</b>	<b>Integrated pest management approach</b>
<ul style="list-style-type: none"> <li>• Fund an additional full-time equivalent data science officer.</li> <li>• Leverage existing data from repositories, crowd-sourced from iNaturalist/ Global Biodiversity Information Facility /Report a Pest, stakeholders, and neighbouring councils to develop a regional data dashboard.</li> <li>• Commission a predictive AI model that integrates data from various sources, updates the dashboard, and identifies current and future pest trends. This model should provide real-time estimations of pest concerns, helping ORC and stakeholders to target and prioritise efforts effectively.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the number of site-led programmes across Otago, varying in size based on local needs and community buy-in. Identify sites by recognised biodiversity value with a clear biosecurity outcome, but also consider local preferences, for example local understanding of need, willingness to participate, or areas of cultural significance and taoka species.</li> <li>• Build on the success of site-led programmes where ORC has taken on a coordinating role.</li> <li>• Sustain funding and provide longer-term financial support for initiatives.</li> <li>• Leverage small-scale management programmes (SSMPs) to progressively act on emerging pest threats (which does not require a consultation under the Biosecurity Act). Embed consideration of SSMPs approach in the next RPMP, explaining how and why it would be used within the RPMP.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify value proposition to gauge catchment group/community interest. Decisions should be based on their capacity and willingness.</li> </ul> <p><i>If the value proposition is clear/support exists, establish the approach</i></p> <ul style="list-style-type: none"> <li>• ORC would provide support and resourcing to catchment groups including involved community groups and groups of landowners.</li> <li>• ORC would ensure that RPMP objectives complement catchment group goals, particularly in biodiversity protection. This would require a formal consultation with the public for the next RPMP.</li> <li>• ORC would take a leadership and communication role and focus on emerging pests and enforcement.</li> </ul>



# 1. Introduction

Otago Regional Council (ORC) contracted Sapere to provide an interim effectiveness evaluation of the Regional Pest Management Plan (RPMP) in Otago. The RPMP is a strategic plan for 51 pests in the Otago Region and was introduced in November 2019. The 2019 version expanded the scope of the 2009 plan, providing additional detail to the task of pest management in the region, and introducing new categories, rules, and programmes. The RPMP aims to manage and reduce the impacts of harmful pests on the region's environment, economy, biodiversity, and communities. Specifically, it provides a framework for ORC to identify priority pest species, set objectives for their control, and outline responsibilities for landowners, local authorities, and other stakeholders.

The RPMP received a material funding uplift since inception. It increased from \$1.3 million in 2019/20 to \$2 million in 2021/22. In 2021/22, it increased by more than 50 per cent to \$3.2 million. It further increased in 2022/23 and 2023/24 to \$3.8 million and \$4 million respectively. The increased funding reflects the fact that the 2019 RPMP introduced significant changes to align with national policies and address local pest management challenges more effectively. The programme is evolving beyond what was initially anticipated when it was established last decade.

## Scope of evaluation

The purpose of Sapere's interim evaluation is to help ORC understand what is working well, identify areas for improvement, assess progress towards pest management objectives and the programme's effectiveness, and provide indications on the trajectory towards meeting objectives by 2029. Where appropriate, we provide recommendations for enhancing the RPMP's delivery to meet its objectives.

We have approached the evaluation using a mixed-method approach. We have analysed interim outcomes with available data and provided further insights into the programme's effectiveness by engaging stakeholders in interviews and workshops.

Our review is guided by the following principal question:

How 'on-track' is ORC to deliver the objectives of the Otago RPMP, and how effective is it in this endeavour?

Our review investigates and three core questions, each validated by appropriate evidence. It:

1. identifies aspects of the RPMP where ORC is being effective in achieving the stated objectives
2. identifies aspects of the RPMP where ORC is not being effective in achieving the stated objectives, and describes how/where improvements can be made
3. provides recommendations to guide the next edition of the RPMP to be more effective and fit-for-purpose.

These three core insights and principal question are broken down into a set of questions intended to guide the evaluation. The questions were developed together with ORC at the onset of the project. They are designed to offer a clear structure and focus for the evaluation.

- Do ORC staff have sufficient support, capacity, and capability available to deliver the RPMP?

- What is the impact (i.e. awareness and compliance) of the RPMP on key populations?
- What are the critical success factors that influence the successes for pest management?
- How does the RPMP align with statutory responsibilities and other pest management strategies?
- What is the impact of the RPMP on interim and end outcomes/what progress has been made towards achieving the pest objectives?
- Is the right investment strategy chosen to deliver an effective programme?
- What are the next steps for the RPMP?

## 2. Context of the RPMP

The Regional Pest Management Plan 2019-2029 is a comprehensive framework designed to address pest management challenges in Otago. Building on the Otago Pest Management Strategy 2009-2019, the RPMP introduces expanded pest categories, updated rules, and site-specific programs while aligning with national policies.

This chapter outlines the continuity and changes introduced in the RPMP, ORC's legislative mandate under the Biosecurity Act 1993 and National Policy Direction for Pest Management 2015, and details the five pest management programmes—exclusion, eradication, progressive containment, sustained control, and site-led programmes. It also examines the responsibilities of ORC and landowners in implementing these programmes.

### 2.1 From 2009 to 2019: shift in pest management

The RPMP is the successor pest management strategy to the Otago Pest Management Strategy (OPMS) 2009-2019. It significantly expands the scope and detail of pest management in Otago, introducing new categories, rules, and programs while building on the foundation laid by the 2009 strategy. It aligns more closely with national policies and introduces site-specific approaches to pest management. This section provides a comparison between the RPMP and the OPMS, highlighting the unique elements and changes introduced by the RPMP.<sup>1</sup>

#### 2.1.1 Continuity from 2009 strategy

##### **Landowner responsibility**

The primary responsibility for managing most pests on private land continues to rest with landowners and occupiers. This approach emphasises the importance of individual action in pest control efforts and maintains continuity with previous pest management strategies. It recognises that effective pest management requires active participation from those who are most directly affected by and in control of their land.

##### **Rabbit management**

Rabbit control remains a specific focus of landowner responsibilities. The requirement to maintain rabbit densities at or below level 3 on the Modified McLean Scale (MMS) indicates a continued commitment to controlling this particularly problematic pest. The MMS is a standardised method for assessing rabbit population density, with level 3 typically representing a low level of infestation. By setting this benchmark, the strategy aims to keep rabbit populations at a manageable level across the region.

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<sup>1</sup> This section is informed by the Otago Regional Pest Management Plan 2019-2029 (Otago Regional Council, 2019a), ORC Council meeting public agenda 25 September 2019 (Otago Regional Council, 2019b), and the Pest Management Strategy for Otago 2009 (Otago Regional Council, 2009).

## **Basic structure of the RPMP**

The RPMP builds upon and extends the pest management approaches established in the 2009 strategy. These approaches include:

- eradication: completely removing the pest from the area.
- control: reducing the pest population to minimise its impact.
- containment: preventing the spread of the pest to new areas.

By maintaining these core strategies while extending their application, the RPMP demonstrates a commitment to continuity in pest management approaches.

## **2.1.2 Changes from the previous iteration**

The RPMP introduces significant changes to align with national policies and address local pest management challenges more effectively. These updates represent a comprehensive overhaul, reflecting the evolving nature of pest management and the need for targeted, robust approaches.

### **Expanded scope**

The number of species classified as pests has more than doubled, increasing from 23 to 51 (see Appendix B for a list of pest species). This broader scope highlights a more comprehensive strategy to tackle a wider range of species that threaten Otago's ecosystems and agriculture.

The increased number of pests in the RPMP necessitates awareness of new rules for new pests among landowners and occupants, and a working system in place to monitor progress against the objectives.

### **Alignment with national policy**

The RPMP addresses inconsistencies with the National Policy Direction for Pest Management 2015, introducing updated objectives, rules, intermediate outcomes, and new programme descriptors:

- Programme categories: exclusion, eradication, progressive containment, sustained control, and site-led management.
- Good neighbour rules: designed to ensure equitable pest management responsibilities across property boundaries, unless a rule is specified.

### **Enhanced landowner responsibilities**

The current plan places greater emphasis on landowner participation, with expanded requirements such as:

- larger gorse and broom free areas
- stricter boundary rules for pests
- simplified rabbit control measures to improve compliance
- new rules targeting Russell lupins.

### **Revised pest categorisation**

The categorisation of pests has also seen changes. In the 2009 strategy, most species (16 out of 21) were targeted for eradication in some form. However, the new RPMP reflects a more nuanced approach based on the effectiveness of past efforts:

- Wilding conifers: reclassified from eradication to progressive containment.
- Gorse and broom: moved from eradication to sustained control.
- Lagarosiphon: now under site-led management instead of eradication.
- Feral rabbits: classified as sustained control due to challenges in eradication.

### **Introduction of site-led programmes**

New site-led programmes target specific areas, including West Harbour – Mt Cargill, and Otago Peninsula. These initiatives focus on managing unique plant and animal pests through localised collaboration.

### **Structural consistency**

The RPMP adopts a nationally consistent structure, facilitating better coordination of pest management efforts across New Zealand.

### **Substantial funding increases**

To support these expanded efforts, the biosecurity budget has seen significant growth:

- 2019/20: \$1.32 million raised to \$1.9 million.
- 2021/22: Increased by more than 50 per cent to \$3.2 million.
- 2022/23: Further raised to \$3.8 million.
- 2023/24: Expanded to \$4 million.

These updates reflect the Otago Regional Council's commitment to addressing complex pest management challenges while ensuring alignment with national guidelines and fostering regional collaboration.

### **Observation on funding and use of funding for RPMP**

ORC provided financial data for the fiscal years 2019/2020 to 2023/2024. A limitation of the current spending records is the lack of linkage between expenditures and RPMP activities. As a result, we were unable to utilise the financial data for the RPMP assessment, which is relevant for incorporating updated financial inputs into the logic models developed in Section 3. We engaged with ORC on the financial data and discussed a proportional increase across pest programmes from the provided baseline figures, reflecting the funding uplift for the RPMP. The consensus was to use the baseline figures. Financial data tied to RPMP activities will be essential for conducting a cost-benefit analysis (CBA) at the conclusion of the 2019-2029 iteration, which is a requirement under the National Policy Direction for Pest Management 2015. We recommend improving the coding of expenditures to align them with RPMP activities, at least at the RPMP programme level, to enhance the utility and accuracy of financial assessments.

## 2.2 Otago Regional Council's legislative mandate

ORC's biosecurity strategy and pest management approach under the RPMP are guided by two key legal frameworks.

### 2.2.1 The Biosecurity Act 1993 (the Act)

The Biosecurity Act establishes the authority and responsibility of regional councils to manage pests and harmful organisms within their regions. Under the Act, regional councils are mandated to:

- coordinate pest management efforts across their regions
- facilitate the development and alignment of regional pest management plans and regional pathway management plans
- encourage public participation and support for pest management initiatives
- promote collaboration among stakeholders to enhance the efficiency, effectiveness, and equity of pest management programs (Section 12B(2) of the Act).

Under this legal framework, ORC has identified 51 plant and animal species as pests in its RPMP, which is reviewed every 10 years. The council is responsible for administering the pest management programs outlined in the plan, including monitoring and enforcing the rules related to pest management. While the Act does not legally require ORC to carry out pest management activities, the council has chosen to take control action against several pest plants.

### 2.2.2 The National Policy Direction for Pest Management (NPD) 2015

Effective since September 24, 2015, the NPD ensures consistency and alignment of pest management plans across New Zealand, promoting efficient resource use. The NPD requires regional councils to:

- set clear objectives and programme descriptions
- conduct cost-benefit analyses and allocate costs
- classify pests into programme types: exclusion, eradication, progressive containment, or sustained control<sup>2</sup>
- define good neighbour rules for equitable pest management.

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<sup>2</sup> The 'site-led' programme type included in the ORC's RPMP is not mandated by the NPD but can be seen as a proactive approach to addressing local ecological challenges.

## 2.3 Operational implementation

Under the NPD, the ORC must prepare an annual operational plan to implement the RPMP. Key features of this plan include:

- proactive engagement: collaboration with landowners and occupiers to encourage participation
- flexibility: use of exemption powers to adapt pest management approaches to specific situations.

### Good neighbour rule

A component of both the NPD and the RPMP, the good neighbour rule applies to old man's beard, wilding conifers, gorse and broom, nodding thistle, ragwort, Russell lupin, and rabbits. The good neighbour rule requires landowners to control pests within certain distances, depending on the pest, along property boundaries when a neighbouring landowner has already undertaken control measures. This obligation also extends to Crown land. We note that in practice, there are limitations to good neighbour rules that reduce their effectiveness compared to a fully rules-based system for pest management. For example, a landowner may comply with the good neighbour rule for gorse by clearing gorse within 10 metres of the boundary, yet still contribute to pest issues affecting their neighbour if the rest of the property remains infested with gorse, allowing gorse seeds to disperse across the boundary.

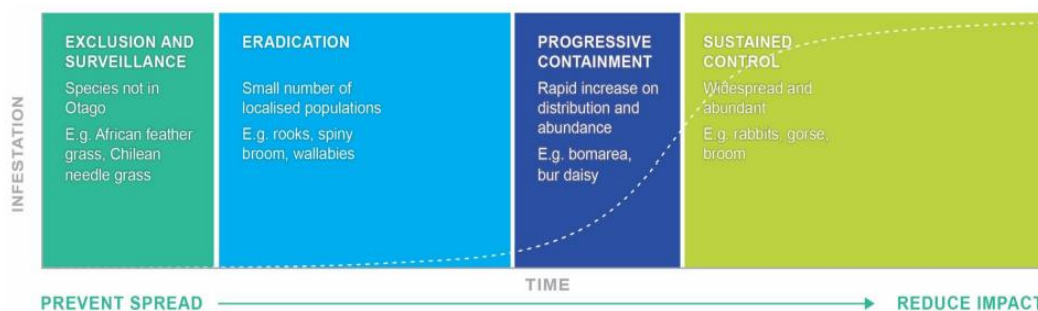
### Partnerships

ORC collaborates with a range of partners to deliver its pest management programmes, particularly for site-led initiatives. Appendix D provides a non-exclusive list of these partners and outlines their roles in supporting pest management efforts.

## 2.4 The RPMP: Five pest management programmes

The 51 pests declared under the RPMP are allocated to five distinct pest management programmes: exclusion, eradication, progressive containment, sustained control, and site-led. The first four programmes are mandatory under the Act, and pests were allocated to the programmes according to their infestation levels in Otago at the time of the RPMP consultation in 2018/19. Figure 1 illustrates the four categories against the pest infestation curve.

Figure 1: Pest infestation curve



Source: Otago Biosecurity Strategy 2019

Across all programmes, the ORC implements a combination of surveillance, compliance oversight and enforcement, public education, and collaboration with landowners and other agencies. This multi-faceted approach is intended to ensure effective pest control, protecting Otago’s natural landscapes, agricultural productivity, and biodiversity from the ongoing threat of invasive species. Our tables in the following section show the varied approach in terms of rules and responsibilities across pests and pest programmes. This variation can pose a challenge in communicating responsibilities to stakeholders and the public, not just due to the large number of pests but also the different responsibilities associated with these pests.

We provide a detailed logic model for each of the programmes to meet their objectives under the RPMP in Section 3. We describe below each programme objective, as well as ORC and land occupier/owner duties under the RPMP rules. This is informed from the Biosecurity Operational Plan 2020/21 (Otago Regional Council, 2020).

## 2.4.1 Exclusion programme

**Objective:** Prevent new pests from establishing in Otago that are present in other parts of New Zealand but have not yet invaded the region.

The overarching goal is to ensure that none of these pests, which are identified as high-risk, establish themselves in Otago. Key threats like Chilean needle grass, moth plant, and hornwort could disrupt Otago’s biodiversity, agriculture, and waterways. The strategy relies on vigilant monitoring in vulnerable areas such as agricultural lands and water systems. This involves close collaboration with neighbouring councils to coordinate efforts and share knowledge about managing these pests. Landowners, particularly in agriculture and water sectors, are also educated to prevent these species from taking hold. Table 5 lists the exclusion pests, responsibilities of ORC and the landowner/occupier, and whether the pest was included in some form in the previous RPMP strategy.

Table 5: Exclusion programme pests

Pest name	ORC				Landowner/occupier		In 2009-2019 strategy
	Advocacy / education	Inspection / monitoring / surveillance	Collaboration	Service delivery	Requirement to act	Good neighbour rule	
African feather grass	Yes	Yes	Yes	Yes	No	No	Yes
Chilean needle grass	Yes	Yes	Yes	Yes	No	No	No
Egeria	Yes	Yes	Yes	Yes	No	No	No
False tamarisk	Yes	Yes	Yes	Yes	No	No	No
Hornwort	Yes	Yes	Yes	Yes	No	No	No
Moth plant	Yes	Yes	Yes	Yes	No	No	No

Source: Sapere derived based on ORC document review and Otago Regional Pest Management Plan 2019-2029.

## 2.4.2 Eradication programme

**Objective:** Eliminate certain pests that are present in Otago, where their populations are still small enough that complete eradication is achievable within the RPMP timeframe.

Target pests include rooks, Bennett’s wallaby, and spiny broom, all of which threaten Otago’s agricultural productivity and native ecosystems. The regional council leads the eradication efforts, organising direct control activities such as rook management. Wallaby control is more complex due to their potential spread from neighbouring Canterbury. For this, Otago collaborates with Environment Canterbury to coordinate control efforts and enforce strict rules against keeping wallabies as pets. Eradication measures are carried out through surveillance, particularly in areas near regional borders, aiming to completely remove these pests from the region. Table 6 lists the eradication pests, responsibilities of ORC and the landowner/occupier, and whether the pest was included in some form in the previous RPMP strategy.

Table 6: Eradication programme pests

Pest name	ORC				Landowner/occupier		In 2009-2019 strategy
	Advocacy / education	Inspection / monitoring / surveillance	Collaboration	Service delivery	Requirement to act	Good neighbour rule	
Bennett’s wallaby	Yes	Yes	Yes	Yes	Yes	No	Yes
Rooks	Yes	Yes	Yes	Yes	No	No	Yes
Spiny broom	Yes	Yes	Yes	Yes	No	No	Yes

Source: Sapere derived based on ORC document review and Otago Regional Pest Management Plan 2019-2029.

## 2.4.3 Progressive containment programme

**Objective:** Contain and reduce the spread of pests that are already established in parts of Otago but are not yet widespread across the entire region.

This programme addresses pests that are established in parts of Otago but have not yet spread across the whole region. It aims to contain these pests, preventing their further spread while reducing their impact in affected areas. Pests like old man’s beard, wilding conifers, and African love grass are controlled through a containment approach, where eradication is attempted in less-affected zones but not feasible in heavily infested areas. Landowners play a crucial role here, being responsible for managing pests on their properties to prevent them from spreading. For instance, wilding conifers are managed differently depending on land types, with strict control enforced in designated areas. This programme aims to contain and reduce the spread of these pests over the course of the RPMP timeframe, protecting areas that are currently pest-free. Table 7 lists the progressive containment pests, responsibilities of ORC and the landowner/occupier, and whether the pest was included in some form in the previous RPMP strategy.

Table 7: Progressive containment programme pests

Pest name	ORC				Landowner/occupier		In 2009-2019 strategy
	Advocacy / education	Inspection / monitoring / surveillance	Collaboration	Service delivery	Requirement to act	Good neighbour rule	
African love grass	Yes	Yes	Yes	Yes	No	No	Yes
Bishop pine	Yes	Yes	Yes	Yes	Yes	Yes	No
Bomarea	Yes	Yes	Yes	No	Yes	No	Yes
Boneseed	Yes	Yes	Yes	No	Yes	No	Yes
Bur daisy	Yes	Yes	Yes	No	Yes	No	Yes
Cape ivy	Yes	Yes	Yes	No	Yes	No	Yes
Contorta (lodgepole) pine	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Corsican pine	Yes	Yes	Yes	Yes	Yes	Yes	No
Douglas fir	Yes	Yes	Yes	Yes	Yes	Yes	No
European larch	Yes	Yes	Yes	Yes	Yes	Yes	No
Maritime pine	Yes	Yes	Yes	Yes	Yes	Yes	No
Mountain pine and dwarf mountain pine	Yes	Yes	Yes	Yes	Yes	Yes	No
Nassella tussock	Yes	Yes	Yes	No	Yes	No	Yes
Old man's beard	Yes	Yes	Yes	No	Yes	Yes	Yes
Perennial nettle	Yes	Yes	Yes	No	Yes	No	Yes
Ponderosa pine	Yes	Yes	Yes	Yes	Yes	Yes	No
Radiata pine	Yes	Yes	Yes	Yes	Yes	Yes	No
Scots pine	Yes	Yes	Yes	Yes	Yes	Yes	No
Spartina	Yes	Yes	Yes	Yes	Yes	No	Yes
White-edged nightshade	Yes	Yes	Yes	No	Yes	No	Yes

Source: Sapere derived based on ORC document review and Otago Regional Pest Management Plan 2019-2029.

### Definition of progressive containment success

We note a degree of ambiguity for progressive containment in meeting pest objectives, i.e. its magnitude of success. Successful progressive containment could be achieved where the pest prevalence is just marginally reduced over the 10-year plan, for example overall by 1 per cent and contained in areas where the pest is present at baseline in 2019. It may be beneficial for ORC to set a specific target to progressive containment for accountability, to specifically define 'progressive' in numeric terms.

## 2.4.4 Sustained control programme

**Objective:** Maintain ongoing control of established pests, to ensure their populations remain at manageable levels and do not spread to neighbouring properties or cause significant damage.

In this programme, the focus is on maintaining control over pests that are well-established in Otago but must be managed to keep their populations in check and moderate their impact. This ensures that they do not cause widespread damage or spread to neighbouring properties. Pests like rabbits, gorse, broom, and nodding thistle are controlled by enforcing rules that require landowners to keep pest populations below a certain threshold. For example, rabbit populations must be kept below level 3 on the Modified McLean Scale, which measures rabbit prevalence. Landowners are required to clear infestations of gorse and broom within specific boundaries to prevent these plants from spreading. In some areas such as riverbeds and watercourses, Russell lupins are targeted to protect sensitive ecosystems. Table 8 below lists the sustained control pests, responsibilities of ORC and the landowner/occupier, and whether the pest was included in some form in the previous RPMP strategy.

Table 8: Sustained control programme pests

Pest name	ORC				Landowner/occupier		In 2009-2019 strategy
	Advocacy / education	Inspection / monitoring / surveillance	Collaboration	Service delivery	Requirement to act	Good neighbour rule	
Broom	Yes	Yes	Yes	No	Yes	Yes	Yes
Feral rabbits	Yes	Yes	Yes	No	Yes	Yes	Yes
Gorse	Yes	Yes	Yes	No	Yes	Yes	Yes
Nodding thistle	Yes	Yes	Yes	No	Yes	Yes	Yes
Ragwort	Yes	Yes	Yes	No	Yes	Yes	Yes
Russell lupin	Yes	Yes	Yes	No	Yes	Yes	No

Source: Sapere derived based on ORC document review and Otago Regional Pest Management Plan 2019-2029.

## 2.4.5 Site-led programme

**Objective:** Manage pests at specific sites where they threaten ecological, cultural, or social value. This programme is focused on protecting high-value areas from the impact of certain pests.

Specific sites like Otago Peninsula, West Harbour – Mt Cargill, and Quarantine and Goat Islands are prioritised for pest management efforts. The goal is to protect rare species and important ecosystems from pest damage. Site-led pest programmes focus on exclusive pests, i.e. pests that are not falling into the remit of the RPMP elsewhere in Otago, such as mustelids, feral deer and cats, and possums. In addition, the management of aquatic pests such as lagarosiphon is critical in key lakes and rivers where the invasive weed threatens water ecosystems. The regional council works closely with communities, government agencies, and conservation groups to manage pest populations in these valuable areas. This programme aims to protect the biodiversity of these high-priority sites by managing or eradicating the pests that threaten them. Table 9 below lists the site-led pests,

responsibilities of ORC and the landowner/occupier, and whether the pest was included in some form in the previous RPMP strategy.

Table 9: Site-led programme pests

Pest name	ORC				Landowner/occupier		In 2009-2019 strategy
	Advocacy / education	Inspection / monitoring / surveillance	Collaboration	Service delivery	Requirement to act)	Good neighbour rule	
Banana passionfruit	Yes	Yes	Yes	No	Yes	No	No
Bennett's wallaby (site-led animals)	Yes	Yes	Yes	Yes	Yes <sup>3*</sup>	No	No
Chilean flame creeper	Yes	Yes	Yes	No	No	No	No
Darwin's barberry	Yes	Yes	Yes	No	No	No	No
Feral cat	Yes	Yes	Yes	No	Yes*	No	No
Feral deer	Yes	Yes	Yes	No	Yes*	No	No
Feral goat	Yes	Yes	Yes	No	Yes*	No	No
Feral pig	Yes	Yes	Yes	No	Yes*	No	No
Gunnera	Yes	Yes	Yes	No	No	No	No
Hedgehog	Yes	Yes	Yes	No	Yes*	No	No
Lagarosiphon	Yes	Yes	Yes	Yes <sup>4</sup>	No	No	Yes
Mustelids	Yes	Yes	Yes	No	Yes*	No	No
Possum	Yes	Yes	Yes	No	Yes*	No	No
Rats	Yes	Yes	Yes	No	Yes*	No	No
Sycamore	Yes	Yes	Yes	No	No	No	No
Tradescantia	Yes	Yes	Yes	No	No	No	No

Source: Sapere derived based on ORC document review and Otago Regional Pest Management Plan 2019-2029.

## 2.5 Interaction with other pest management programmes

While ORC has a mandate to act, it is also important to note that the RPMP intersects with several national and regional pest control programmes that themselves impact on the effectiveness of pest control by creating awareness and compliance. Thereby, these programmes are likely interacting with the impact of the RPMP on related pest objectives, and vice versa.

<sup>3</sup> \*No person shall keep, hold, enclose or otherwise harbour in any place, either in transit to or present at West Harbour – Mt. Cargill, on the Otago Peninsula and on Quarantine and Goat Islands: Bennett' Wallaby, feral deer, feral goat, feral pig, mustelid, feral cat, hedgehog or possum; and rats on Quarantine and Goat Islands.

<sup>4</sup> ORC can undertake service delivery e.g. at priority sites not controlled by LINZ. Primary control is undertaken by LINZ.

This reverse relationship is likely most notable for wilding conifers and wallabies. The National Wilding Conifer Control Programme, established in 2016, aims to prevent their spread and progressively reduce wilding conifer infestations. This programme complements regional efforts like Otago's wilding conifer strategy, which fills the gap between national strategies and local operational plans. ORC plays a critical role in providing leadership, enabling control efforts, and ensuring compliance under the RPMP framework. Collaboration with stakeholders such as landowners, community groups, and forestry industries is central to these initiatives (Ministry for Primary Industries, 2014; Otago Regional Council, 2025).

Other overlapping initiatives include the Tipu Mātoro National Wallaby Eradication Programme, aimed at containing and eradicating wallaby populations. The Tipu Mātoro National Wallaby Eradication Programme is a collaborative effort to control and eradicate invasive wallabies in New Zealand, aiming to protect native biodiversity, agricultural productivity, and regional ecosystems. In Otago, ORC plays a key role in the programme by monitoring wallaby populations, supporting landowners with control efforts, and raising public awareness. ORC's involvement is crucial in preventing the spread of wallabies from neighbouring regions, ensuring the long-term health of the environment and agricultural sectors. Community participation and cross-regional cooperation are central to the programme's success.

### 3. Intended path of RPMP effect: logic models

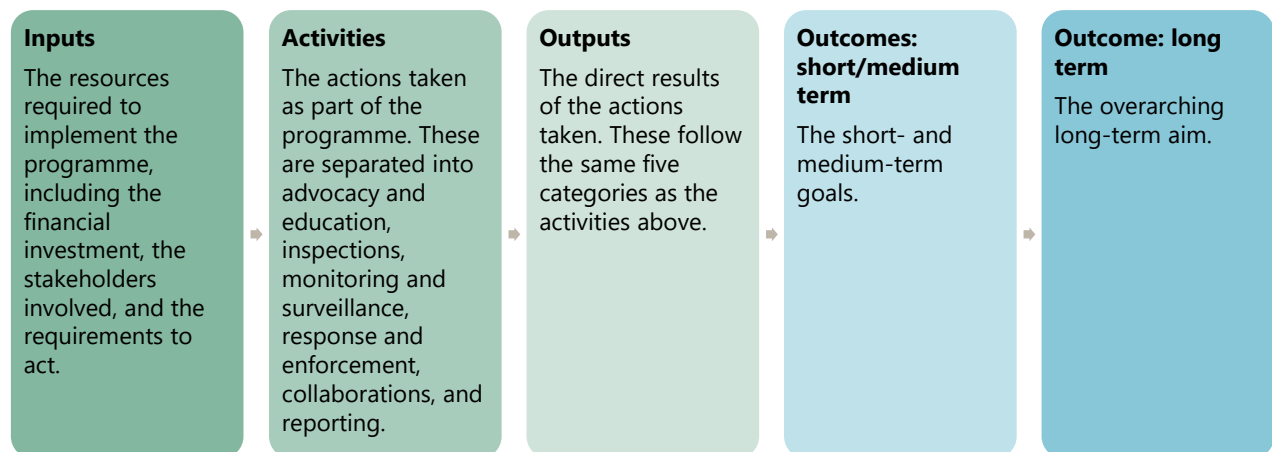
In this chapter, we present our developed RPMP programme-specific logic models. The models are intended to help readers understand how the ORC aims to achieve its pest management objectives.

A logic model is a visual tool that illustrates the relationship between a programme’s resources, activities, outputs, and intended outcomes.

We develop retrospective logic models for each pest management program, informed by ORC’s pest management and biosecurity plans, annual Biosecurity Operational Plan reports, and key performance indicators (KPIs) (2020/21–2023/24). Following the Department of Conservation (DOC) approach, these models focus on outcomes rather than impacts, with long-term outcomes serving as impact indicators. It is important to note that activities and measures can change between years when the operational plan is revised/updated. Accordingly, the components of the logic models can change over time, and the interpretation of the models is exemplary.

The logic models are composed of five components, illustrated below.

Figure 2: Logic model components



#### Note on expenditure data

ORC provided us with RPMP expenditure data from 2019/20 to 2023/24. However, from 2020/21, the financial coding was changed so that RPMP expenditure could not be split by programme. As a result, we must examine expenditure for the RPMP in aggregate. Allocation of funds against pest management programmes are informed from the biosecurity plan 2020/21 and reflect a total allocation of about \$2 million per annum. We decided against updating these figures to reflect the funding uplift as a proportionate linear increase after testing with ORC. ORC’s RPMP expenditure rose significantly over five years, from \$1.3 million in 2019/20 to \$4 million in 2023/24, with a notable 50 per cent jump in 2021/22.

The rest of the section outlines each programme’s logic model. We note that rules and enforcement are discussed in further detail in section 4.

## 3.1 Exclusion programme

The exclusion programme is the responsibility of ORC. It is allocated \$4,000 of funding annually. We note that this figure does not include staff cost. Key stakeholders include ORC staff, farmers, river users, neighbouring councils, biosecurity experts, and Crown agencies.

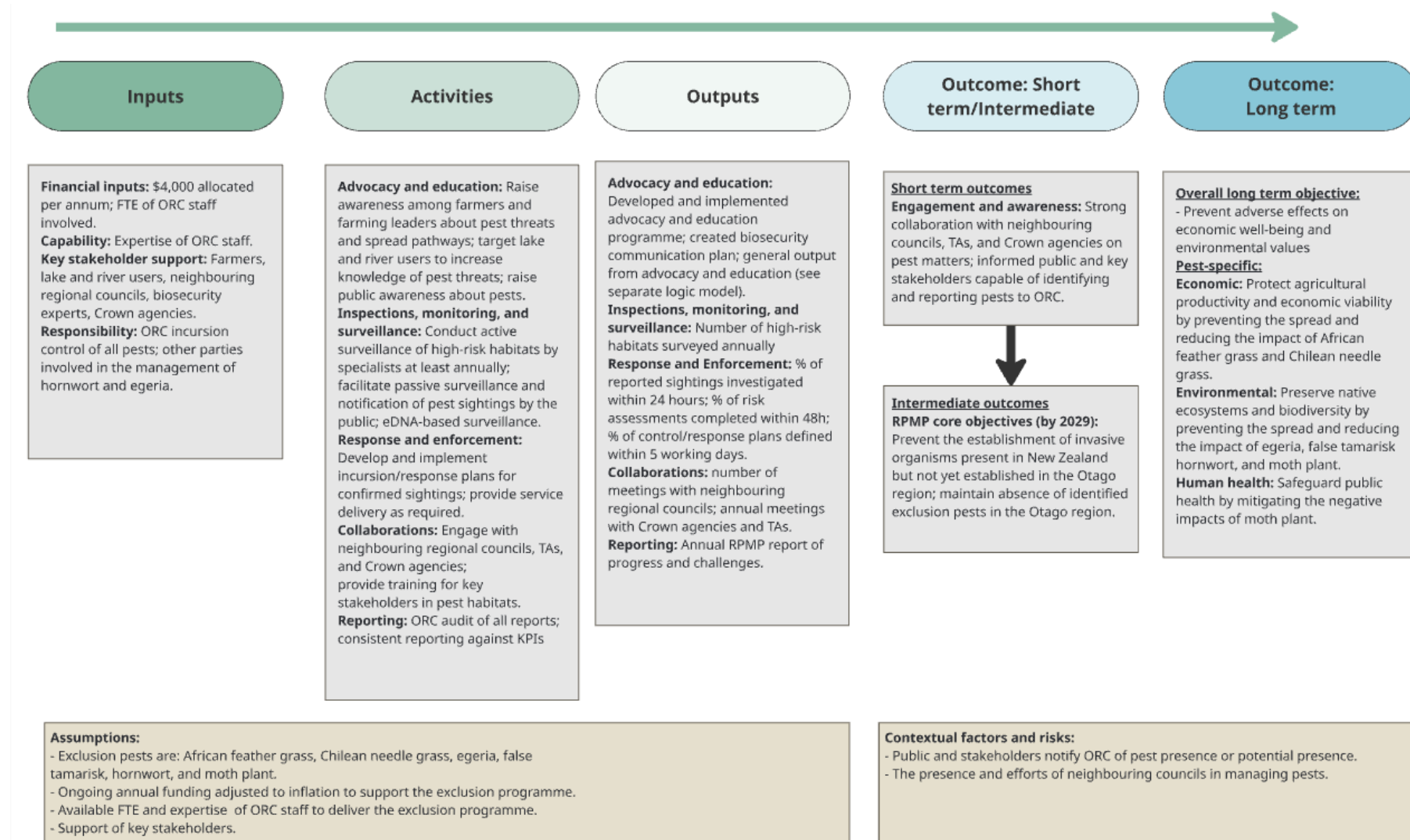
The core activities relate to advocacy and education to raise awareness, inspections to manage high-risk habitats, eDNA-based surveillance, and enforcement to respond to sightings of pests. To do so, ORC work with neighbouring regional councils, territorial authorities, and Crown agencies.

The exclusion programme's outputs relate to tangible results from its activities. They include education programmes, high-risk habitat surveys, investigations, and meetings held. Reporting mechanisms are also in place, ensuring that ORC can audit and track pest control progress and challenges.

In the short term, the programme aims to promote collaboration with its stakeholders and inform the public about reporting pests. In the medium term, it aims to prevent invasive pests that are present in New Zealand from establishing in Otago.

The long-term objective is to protect Otago's economic, environmental, and human health. The economic health focus aims to protect the agricultural value of land. For environmental health, it aims to preserve the natural environmental value. The human health goal is to mitigate moth plant's impacts.

Figure 3: Exclusion programme logic model



## 3.2 Eradication programme

The eradication programme is allocated \$349,000 annually. The majority (97 per cent) of this figure is assigned to wallabies, with smaller amounts to rooks (2 per cent), and spiny broom (1 per cent). ORC is responsible for all three pests, while occupiers, landowners, and the public are required to help report and manage wallabies.

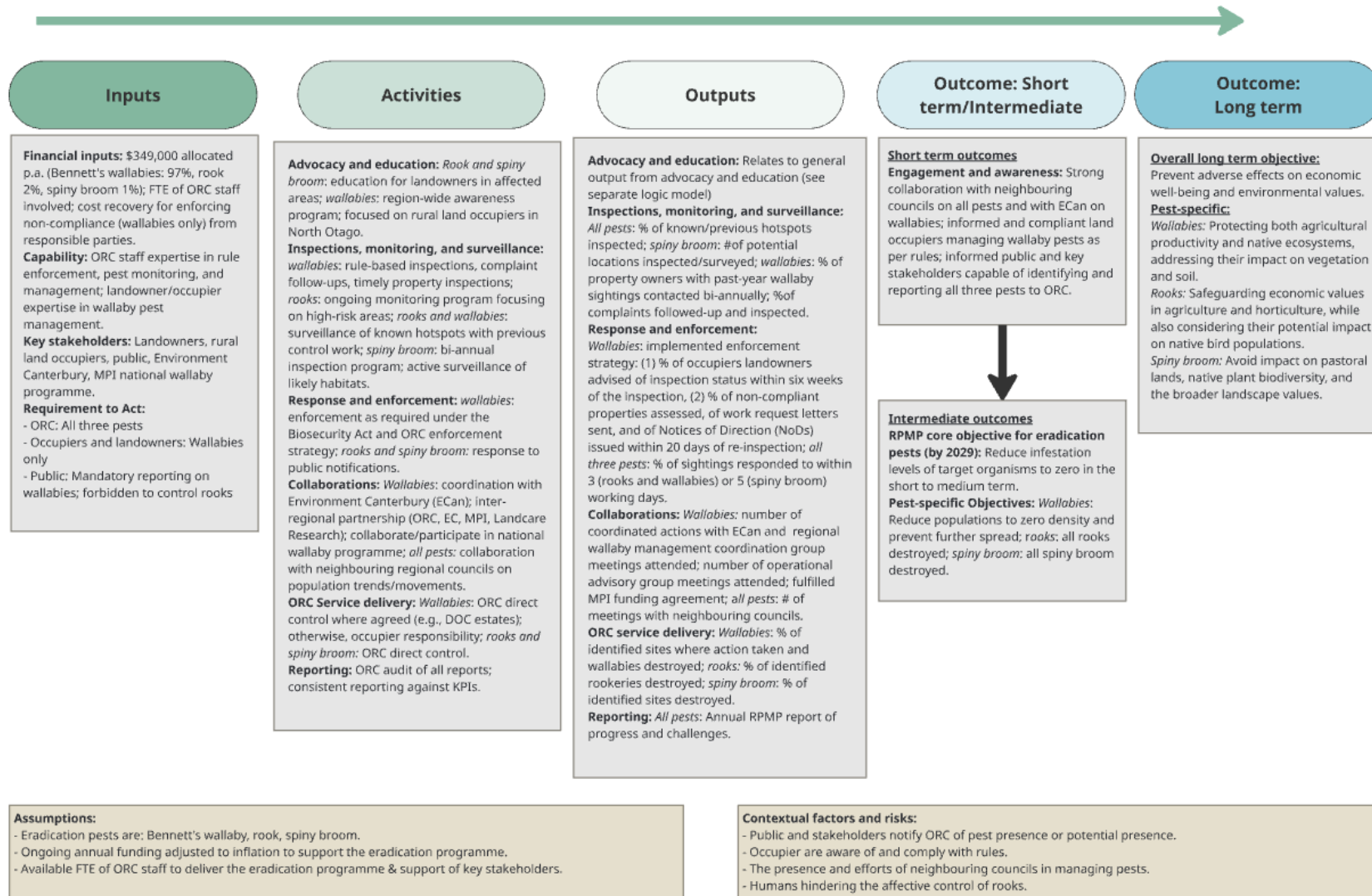
The programme's activities involve landowner education to increase awareness, inspections to ensure compliance, and monitoring and surveillance of high-risk areas. ORC enforces compliance as required, and facilitates collaboration with Environment Canterbury, Ministry for Primary Industries (MPI), Landcare Research, and the national wallaby programme.

The outputs directly relate to activities. These include the number of inspections, the enforcement strategy implementations, sightings responded to, meetings held, and pests destroyed. Reporting is also required to ensure the ORC tracks progress and challenges.

The short-term outcome is to promote collaboration between neighbouring councils on all pests, and to increase the public's awareness. The medium-term outcome is to reduce infestation levels of the three pests to zero.

The eradication programme's long-term outcome is to protect Otago's economic and environmental value. Wallaby eradication will preserve the agricultural value of land. Similarly, rook eradication will preserve agricultural value while also protecting native bird populations. For spiny broom, eradication will preserve the land's pastoral and biodiversity value.

Figure 4: Eradication programme logic model



### **3.3 Progressive containment programme**

The progressive containment programme is funded with an annual budget of \$442,500. This budget is assigned to old man's beard (32 per cent), wilding conifers (27 per cent), Nassella tussock (16 per cent), spartina (7 per cent), African love grass (2 per cent), and the remainder to low incidence pests. ORC, landowners, occupiers, and Crown agencies are the stakeholders involved. Property owners are subject to the good neighbour rule for old man's beard and wilding conifers.

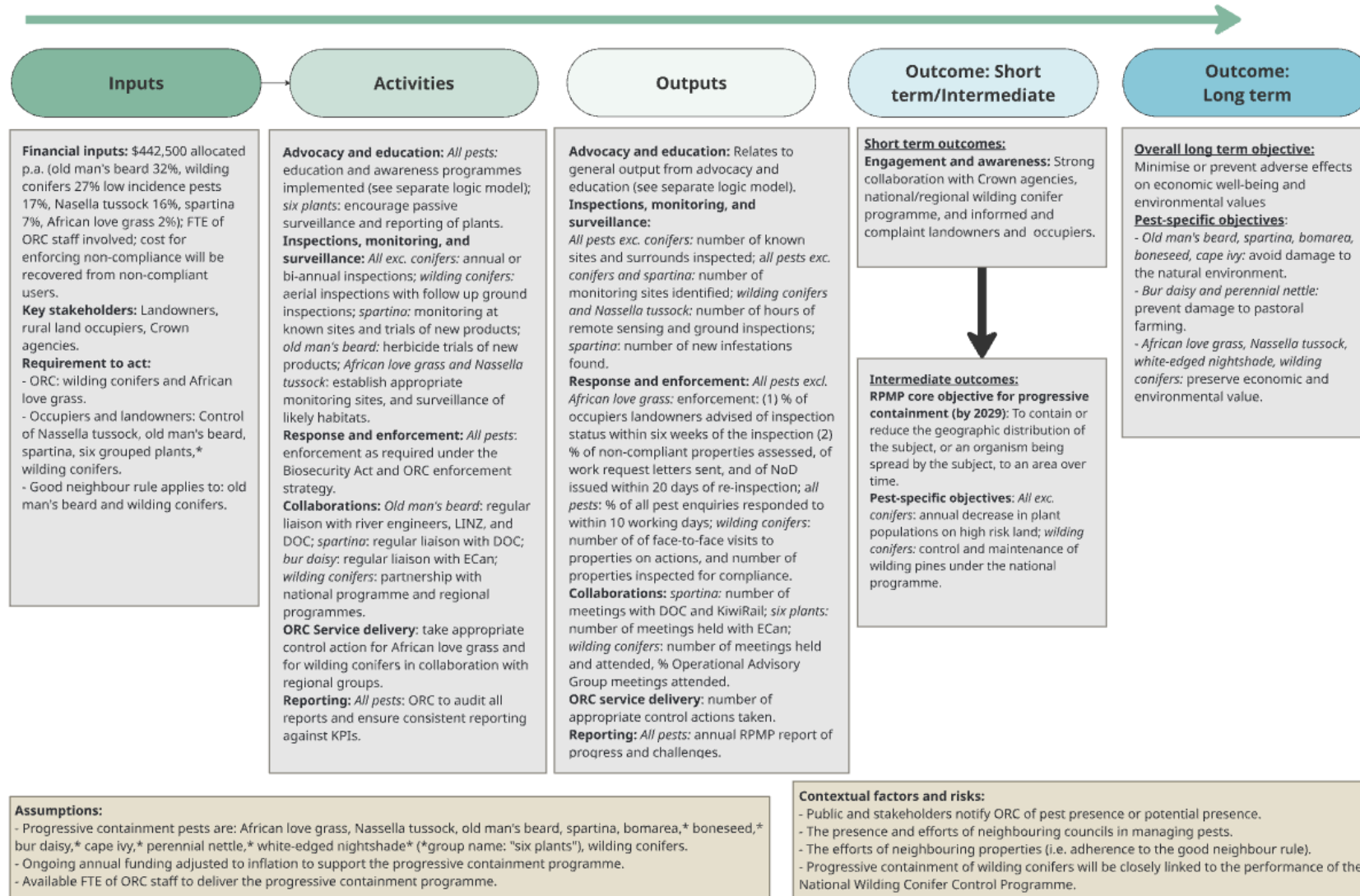
Education activities promote awareness of progress, control pests and encourage surveillance and reporting. ORC conduct regular inspections and monitor high-risk sites for signs of new infestations, with enforcement actions taken for non-compliance. Collaboration with stakeholders is crucial, particularly with the national and regional wilding conifer programmes.

The programme's outputs include increased public awareness, inspections of known sites, compliance KPIs met, meetings held, and control actions taken. The ORC also reports on progress and challenges.

The short-term outcome is to collaborate with stakeholders and inform landowners and occupiers. The medium-term outcome is to contain or reduce the pest's geographic distribution. This outcome involves reducing the spread of the pest population on high-risk land and assisting with the control of wilding conifers under the national programme.

The long-term goal is to limit the pests' impact on the economic and environmental value of Otago. For old man's beard, spartina, bomarea, boneseed, and cape ivy, the goal is to prevent environmental damage. For bur daisy, white-edged nightshade, African love grass, Nassella tussock, and perennial nettle, this involves protecting the pastoral value of land.

Figure 5: Progressive containment programme logic model



### **3.4 Sustained control programme**

The sustained control programme is allocated \$903,000 per annum, with the majority (89 per cent) targeted at feral rabbits. Key stakeholders are landowners, occupiers, Crown agencies, and community rabbit programme participants. Occupiers and landowners are legally required to act for all pests and are subject to the good neighbour rule for rabbits, nodding thistle, ragwort, gorse, broom, and Russell lupin.

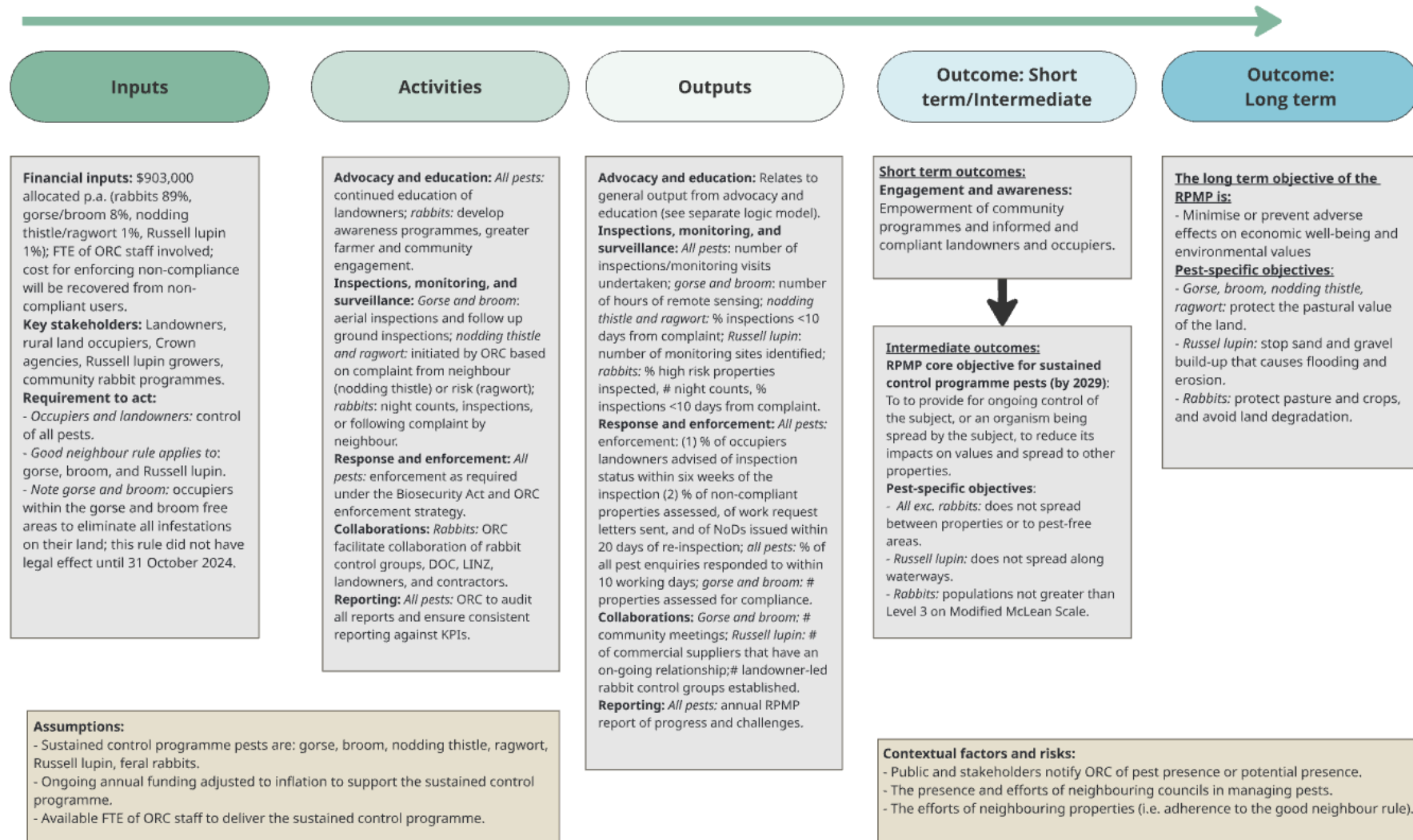
Advocacy and education activities aim to increase landowners' awareness. ORC inspect properties to ensure compliance and follow up with enforcement activities as necessary for non-compliant properties. Collaboration includes meetings with the community, Russell lupin commercial suppliers, and local community rabbit groups. ORC is required to report on all progress and changes.

The outputs relate to measurable activities such as the number of inspections, monitoring visits, and enforcement measures. KPIs track compliance rates and response times to ensure complaints are followed up. Collaboration outputs relate to the number of meetings held.

The short-term outcome is to inform landowners and occupiers. The medium-term outcome is to control pests to reduce their spread. For Russell lupin, this is to prevent spread along waterways.

The long-term outcome is to minimise or protect economic and environmental value. For all pests, excluding Russell lupin, this is largely to preserve pastoral values and native ecosystems. For Russell lupin, the goal is to limit flooding and erosion and protect biodiversity values.

Figure 6: Sustained control programme logic model



### 3.5 Site-led programmes

Site-led programmes were allocated \$112,000 per annum at RPMP baseline in 2019/20. This figure changed to \$200,000 in the year 2023 as per ORC financial data. 24 per cent of this figure is allocated to lagarosiphon with the remainder allocated to the other sites. Stakeholders include landowners, water users, volunteer and community groups, occupiers, and Land Information New Zealand (LINZ). Landowners must report wallabies and destroy all lagarosiphon. Water users are also required to remove lagarosiphon.

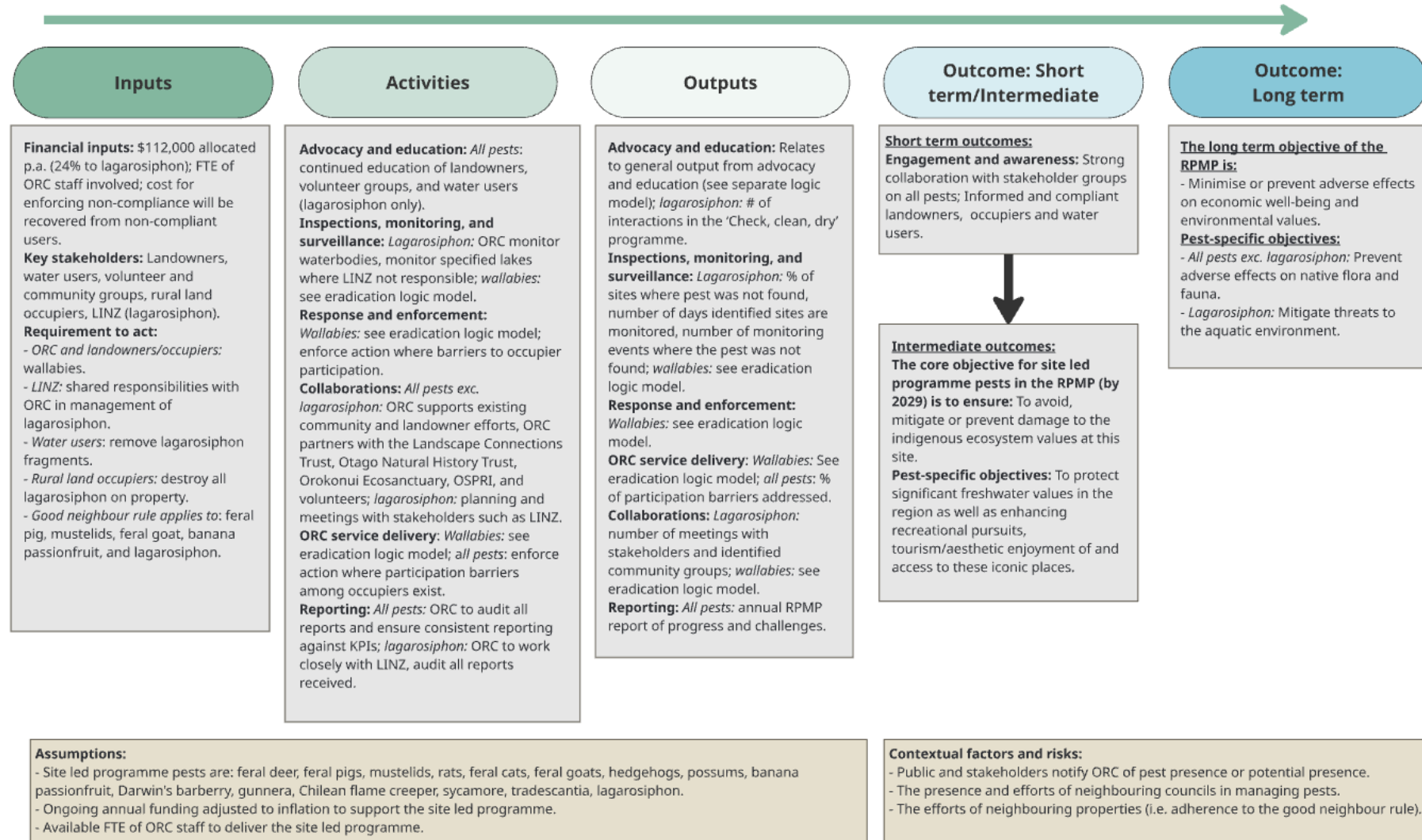
Activities include education of stakeholders, the inspection and monitoring of waterbodies, and enforcement as required. ORC will facilitate collaboration with community groups, landowners, occupiers, and relevant organisations. For lagarosiphon, ORC partners with LINZ. Reporting is required for progress and challenges.

The outputs include interactions with the 'Check, Clean, Dry' programme, monitoring events, enforcement as required for wallabies, participation barriers addressed, and meetings held.

The short-term outcome is to inform stakeholders to ensure they comply with requirements. The medium-term outcomes are to prevent damage at the designated sites.

The long term-objective is to prevent adverse economic and environmental impacts. For lagarosiphon, this includes impacts on the aquatic environment. For all other pests, this includes the impact on native flora and fauna.

Figure 7: Site-led programme logic model



## 4. Key to effectiveness: awareness, compliance, and enforcement

A critical chain of success factors runs through each of the five pest programmes:

Figure 8: Critical chain of success factors



Each of the five pest programmes include activities and outputs related to creating awareness of the RPMP and its rules. Since engagement activities overlap between the programmes, i.e. they are not isolated to a singular programme, we will describe in another logic model how ORC is approaching engagement to create awareness: a foundation for an effective RPMP. We then describe ORC’s strategy of enforcement.

### 4.1 Creating awareness among occupiers and landowners

In the model below (Figure 9), we describe ORC’s approach to creating awareness of the RPMP pests and its rules to occupiers and landowners. The logic model shows how ORC approaches these outcomes in its communication and engagement strategy.

The logic model is informed by the ORC Biosecurity Compliance and Enforcement Policy (2024), the KPIs relating to biosecurity communication of ORC from 2021 to 2024,<sup>5</sup> and the RPMP.

The engagement strategy is allocated \$11,000 per annum. This funding is used to facilitate communication for the RPMP. The key stakeholders associated with this strategy include community groups, NGOs, Crown agencies, other regional councils, iwi, and the public.

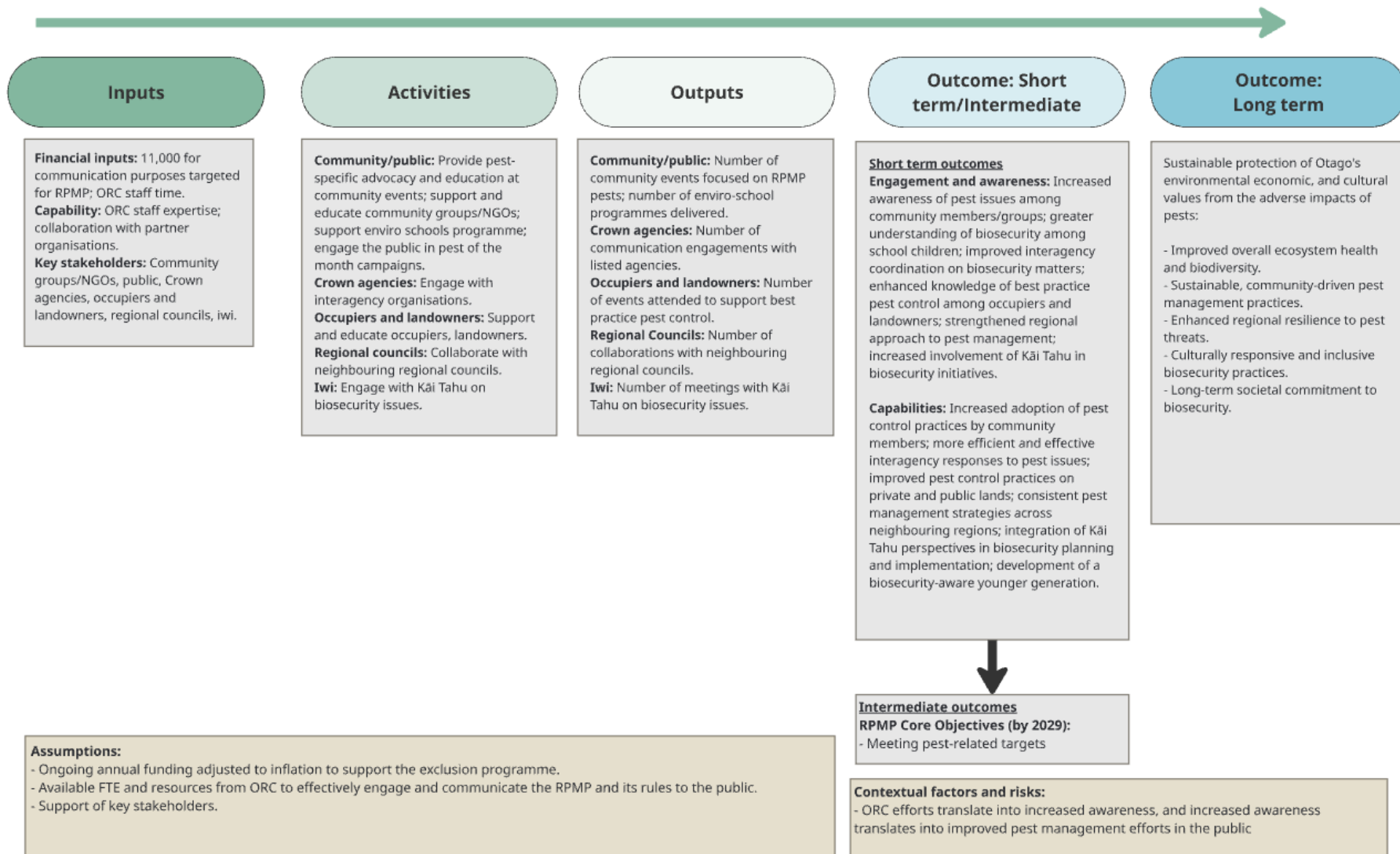
The key activities focus on collaboration, facilitation and education. For example, to collaborate with neighbouring councils, to facilitate discussions with iwi and landowners, and to advocate for pest-specific objectives by educating the public.

The engagement strategy’s short-term outcomes are to increase community engagement and awareness of pest issues. It aims to increase pest control efforts to meet the RPMP’s pest-specific objectives. These actions will support the long-term objective of the sustainable protection of Otago’s natural environment.

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<sup>5</sup> Received documentation from ORC: *BOP KPIs 2021/22, 2022/23, 2023/24 Tracking-RER*

Figure 9: ORC engagement strategy logic model



## 4.2 Enforcement strategy of Otago Regional Council: a progressive approach

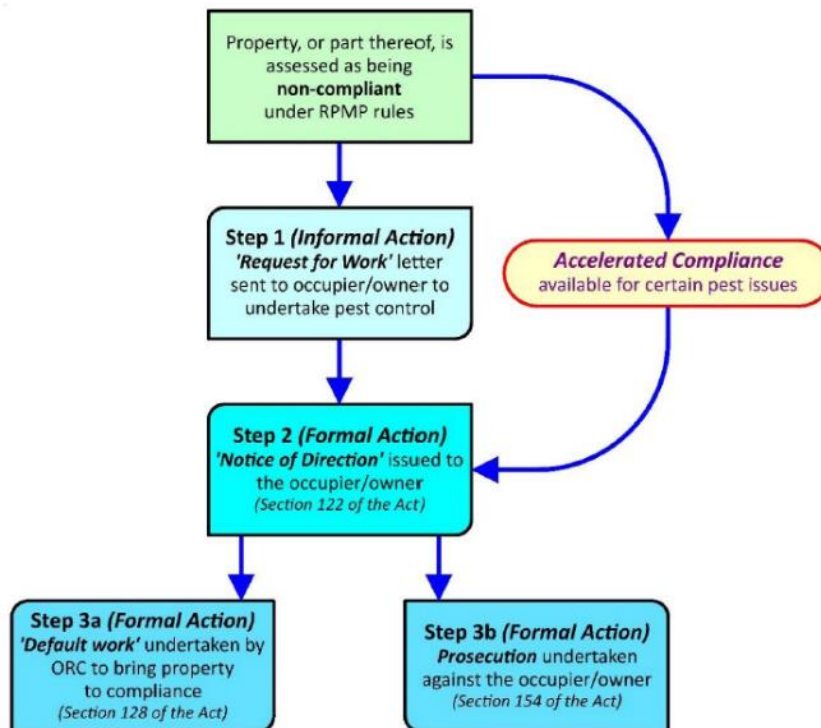
ORC oversees compliance with the Biosecurity Act 1993 and the RPMP 2019–29. This includes enforcing pest management responsibilities for landowners and occupiers (private, public, and Crown entities) where rules determine (see Table 5 to Table 9 in section 3 describing ORC’s enforcement responsibilities by pest).

Key principles include:

- **landowner and occupier responsibility:** land occupiers must manage pest spread according to rules of the RPMP.
- **ORC enforcement role:** non-compliance with RPMP rules constitutes an offence under the Act. The Act does not specify thresholds for non-compliance, giving ORC discretion to determine enforcement standards.

ORC’s strategy emphasises an education and progressive approach to compliance enforcement as illustrated in Figure 10 below.

Figure 10: ORC’s approach to enforcing compliance to RPMP rules



Source: ORC Biosecurity Compliance and Enforcement Policy (2024)

At Step 1, if a property is non-compliant to the rules upon an ORC inspection, ORC provides an informal, non-legally binding request (not covered under the Act) to the occupier/landowner to complete work within a set timeframe before a re-inspection is carried out. This is an educational

approach taken by ORC, giving the benefit of the doubt in the first instance of lack of awareness around RPMP rules among occupiers/landowners.

At Step 2, if the property is still found to be non-compliant, ORC can, under the Act, issue formal action under a Notice of Direction (NoD). Non-compliance with a NoD is an offence under the Act and can lead to further enforcement action, such as default work or prosecution. However, ORC have never taken this action.

The Act gives ORC the power to recover the costs associated with its compliance monitoring obligations. This is provided for under Section 135(3) and Section 129 of the Act. ORC can further, under the Act, recover from the liable occupier/landowner the actual and reasonable cost of default work as a debt due.

Currently, ORC does not apply charges to informal actions, such as a scheduled inspection or a re-inspection when the property has become compliant.

**ORC's strategy relies on four critical success factors:**

1. Good monitoring and understanding of pest prevalence by ORC to carry out inspections and identify non-compliant properties.
2. Reporting of deviation from pest management rules by public to lead to inspections.
3. Awareness by landowners and occupiers of their responsibilities under the RPMP rules and the reasons that pests are problematic, i.e. providing the public an explanation as to why they should act.
4. In the first instance, goodwill to adapt to active pest management by landowners and occupiers due to an education first strategy selected by ORC.

**Note on the current enforcement approach**

There is risk in ORC's reliance on voluntary compliance for enforcement. Our analysis in chapter 5 indicates a lack of compliance after re-inspections and the lack of following through on non-compliant properties with default work or prosecution.

This may reflect considerations of enforcement practicality or fairness, but also highlights potential risks to achieving pest objectives, including effective pest management.

ORC has issued 47 NoDs between July 2022 and June 2024 (2021/22 KPI tracking data) (Otago Regional Council, 2023c, 2023b). Of the two NoDs issued in 2021/22, one property achieved compliance. Of the 21 NoDs issued in the 2022/23 financial year, only one property became compliant. We have no information on compliance outcomes for the four NoDs issued in 2023/24.

While limited, the NoD data from 2022 to 2023 also indicates low initial compliance (1 of 21 NoDs). This presents an opportunity for strengthening compliance enforcement. It is also unclear whether the remaining properties achieved compliance following subsequent inspections in the following year or whether such inspections were conducted (one in 2021/22 and 20 in 2022/23). We acknowledge the increasing number of NoDs served by ORC over the years—from two in 2021/22, to 21 in 2022/23, and 24 in 2023/24.

However, we are not aware of any instance where non-compliance with NoDs resulted in default work or prosecution. It should be noted that prosecution is expensive and may not be cost-effective for ORC.

An alternative approach could focus on enforcing behavioural change. This could involve including in the NoD a statement outlining the debt ORC will claim if it must engage a contractor to complete the required work on non-compliant properties. If compliance is still not achieved, ORC could proceed with the work and recover costs from the non-compliant property.

This approach – where costs are clearly signalled, and an invoice is issued – has been recognised as a successful enforcement strategy by Dunedin City Council (according to interview findings). Further follow-up should then be undertaken where compliance remains outstanding.

## 5. Effectiveness of the RPMP

Building on the preceding contextual chapters and logic models, we present in this chapter our effectiveness assessment. We identify:

- aspects of the RPMP where ORC is being effective in achieving the stated objectives
- aspects of the RPMP where ORC is not being effective in achieving the stated objectives, and how/where improvements can be made.

Our assessment is structured around these two key categories, examining each RPMP programme and the specific pests within them. Effectiveness findings are linked to programme logic model elements (*input, activity, output, outcome*). This approach highlights where implementation is efficient, where gaps exist, and where improvements can be made.

### 5.1 Data approach

We triangulate information from three main sources:

#### 1. Stakeholder engagement (see Appendix D for details)

- Interviews assessing the effectiveness of the current RPMP.
- Workshops gathering recommendations for improving the current and future iterations of the RPMP.

#### 2. ORC-provided primary and secondary data

- ORC biosecurity monitoring, inspection, and compliance data covering the RPMP period until October 2024 (with analysis focused on the past two years due to progressive development of the data system).
- Compliance data from ORC annual biosecurity operational plans (2020/21–2023/24).
- Before-and-after inspection data on pest compliance and infestation levels (primarily old man's beard and rabbits) from November 2022 to September 2024.

#### 3. Externally sourced pest reporting data

We use iNaturalist data from financial years 2016/17 to 2023/24, instead of ORC data due to its coverage before and after the current RPMP's inception. iNaturalist provides a baseline for assessing changes in pest presence and tracking ORC's progress against RPMP pest objectives. We adjust iNaturalist data to account for the observed trend of increases in service users and reporting of pests in iNaturalist since 2016/17.

A detailed assessment of ORC data is provided in Appendix B. We note here that ORC has significantly improved its data infrastructure over the course of the current RPMP, including investments in geo-tagging, data consistency, and tracking pest infestations before and after inspections. These improvements aid follow-up actions such as public communication on compliance and enforcement and targeting of pest management efforts.

## 5.2 How effectiveness is assessed

Effectiveness is assessed through two key outcomes against the specific pest objective:

- **Outcome 1: Pest prevalence** – Measuring the RPMP’s impact on pest populations in Otago, the programme’s primary objective.
- **Outcome 2: Compliance** – Evaluating adherence to RPMP pest control measures, which is crucial for achieving programme goals.

Both are essential for the RPMP’s long-term success.

### Outcome 1: Pest prevalence

Due to the newness of ORC’s available pest prevalence data, we inform pest presence from the publicly accessible flora and fauna repository iNaturalist. The advantage of using iNaturalist data is that it covers a period before and after the inception of the current RPMP. This permits us to understand pest trends and comparison against a baseline. The time taken to progressively and iteratively develop ORC’s new data system in collecting pest data during the first years of the current RPMP in ORC data further prompted us to use iNaturalist. However, as noted above, we triangulate and assess the validity of the data with the ORC information (see section 5.1).

iNaturalist data was extracted for RPMP-listed species from 2016/17 to 2023/24. While it does not directly measure prevalence, we adjust observations to account for confounding factors such as increased app awareness and the impact of COVID-19 lockdowns. Adjustments are based on the number of unique users reporting each pest per year, assuming a constant likelihood of reporting across years. While we are using pest-specific data in the assessment, we provide further spatial mapping of iNaturalist pest observations by calendar years in Appendix E.

### Outcome 2: Compliance

Compliance is assessed using ORC inspection and reinspection data, focusing on the period after 2020/21 due to the progressive changes in ORC’s data system over the first years of the RPMP. ORC staff highlighted changes in how inspections were counted, affecting comparability over time. In the first iteration of electronic data collection (2019-2021), a pest sighting was recorded as an "inspection" meaning one property could have multiple inspections, leading to administrative challenges. At this time, occupiers could receive multiple letters for rule breaches.

To address this, the model was changed to a property-based inspection approach, where each inspection now corresponds to a distinct property, regardless of size. Pest sightings are now recorded as "infestations," not as separate inspections. For instance, the number of old man’s beard inspections fluctuated significantly between 2019/20 and 2023/24, reflecting improvements in data capturing rather than actual pest number changes.<sup>6</sup>

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<sup>6</sup> Old man’s beard inspections—in 2019/20: 3,437; in 2020/21: 3,436; in 2021/22: 1,189; in 2022/23: 841; and 876 in 2023/24. The drop in numbers overlaps with the timing of ORC improvement and changes in data capturing.

### Key compliance data sources

- ORC annual biosecurity reports, which disaggregate plant pest compliance data only from 2021/22 onwards.
- ORC-provided before-and-after inspection data for plant pests (Nov 2022–Sept 2024).
- ORC-provided compliance data for rabbits (2021/22 to 2023/24), and before-and-after prevalence data (Nov 2022 to Sept 2024).

We note that compliance data as per annual biosecurity reports is only disaggregated for the year 2021/22 for plant pests. For subsequent periods, ORC provided before-and-after inspection and re-inspection pest prevalence data for plant pests from November 2022 until September 2024 (when Sapere requested the data).

We use ORC-provided data for calculation of compliance rates. Compliance rates are calculated using the proportion of properties that were inspected and found to be compliant with the RPMP's rules. Compliance rates were not calculated for pests with less than five inspections. 'Informational' inspections were excluded from this analysis.

Changes in ORC's reporting methodology mean that, from 2023/24, all pests except rabbits are reported in aggregate. To supplement this, we use ORC's site-specific before-and-after inspection data (Nov 2022 to Sept 2024), which grades infestation severity. Compliance thresholds vary by pest:

- Rabbits – The Modified McLean Scale (MMS) is used (ranging from 1 = no sign of rabbits to 8 = very frequent presence). Compliance is defined as an MMS score of 3 or below.
- Other pests (e.g. bomarea, old man's beard) – ORC's Infestation Grading Scale (IGS) is used (ranging from 0 = no pest to 4 = severe infestation). Compliance depends on the pest, e.g., for ragwort, gorse, and broom, any level above 0 indicates non-compliance.

## 5.2.1 Category definitions

We assess effectiveness as follows:

- **Effective:** There is clear evidence which identifies ORC as being effective in achieving stated pest objectives. For effectiveness, measurable pest outcomes show that objectives are met, including stakeholder/landowner engagement and compliance.
- **Partially effective:** Some aspects of the programme are achieving objectives, but not all. There may be limitations in scope, execution, or external factors that prevent full effectiveness. There is progress towards pest objectives, but targets are not fully met, or success is observed in some geographic areas but not others.
- **Not effective:** Clear evidence indicates that ORC is failing to meet its stated pest management objectives. The intervention is not delivering meaningful outcomes. There is no measurable progress in meeting pest objectives, or negative trends despite continued intervention. There is widespread non-compliance or lack of stakeholder/landowner support.
- **Inconclusive:** There is insufficient evidence to determine effectiveness, either due to data gaps, lack of monitoring, or methodological limitations.

## 5.3 Findings

### 5.3.1 High-level summary of effectiveness findings

#### **ORC is partially effective in meeting RPMP pest objectives**

In assessing the RPMP and the effectiveness of ORC in achieving its stated objectives, we have conducted a pest-by-pest evaluation. Findings indicate that, overall, ORC is partially effective in meeting the pest objectives of the RPMP. ORC has made important investments, such as improving pest data capture and increasing its biosecurity team, in response to meeting the RPMP objectives. These changes are significant, and we believe that ORC can build on this progress to achieve greater effectiveness by the conclusion of the RPMP.

#### **Pest-by-pest effectiveness findings from our assessment, grouped within pest programmes**

##### ***Exclusion pests***

ORC is **effective** in achieving the stated pest objectives for African feather grass, Chilean needle grass, egeria, false tamarisk, hornwort, and moth plant.

##### ***Eradication pests***

ORC is **effective** in meeting pest objectives for rooks and spiny broom. ORC has also been successful in raising awareness of the wallaby issue in Otago. However, it is currently **not effective** in achieving the objective of reducing wallaby populations to zero density and preventing their spread.

##### ***Progressive containment pests***

ORC is **effective** in meeting objectives for spartina and partially effective in achieving pest objectives for wilding pines, African love grass, and Nassella tussock. However, ORC is currently **not effective** in meeting pest objectives for bomarea and old man's beard. For boneseed, bur daisy, cape ivy, perennial nettle and white-edged nightshade, the assessment is **inconclusive** due to insufficient information.

##### ***Sustained control pests***

ORC is **partially effective** in meeting the pest objective for feral rabbits. It is **not effective** in meeting objectives for gorse and broom, as well as Russell lupin. The effectiveness of ORC's control of nodding thistle and ragwort is **inconclusive**.

##### ***Site-led programmes***

Progress has been made for lagarosiphon (sites), the Otago Peninsula, and West Harbour – Mt Cargill. However, objectives have not yet been fully met, and we assess the current state as **partially effective**. Our assessment for Quarantine and Goat Island is inconclusive due to insufficient information.

### 5.3.2 Exclusion programme

**Assessment finding:** ORC is **effective** in achieving the stated RPMP objective of preventing the six high-threat pest plants from establishing in the region.

#### Data assessment

No exclusion pests (i.e. African feather grass, Chilean needle grass, egeria, false tamarisk, hornwort, and moth plant) are reported in iNaturalist. This can indicate that ORC’s efforts are effective in stopping incursions from areas outside of Otago. However, there is a degree of uncertainty in this judgement, as reporting relies on public awareness of these pests, and because exclusion pests are lowest on the incursion scale, those pests will be less likely to spot. We note that exclusion species are included in ORC’s eDNA alert list which can contribute to raising awareness.

We have received information from ORC that four historical reports (pre-current RPMP) of African feather grass have been followed up recently (January to February 2025) and no presence has been confirmed.

Public compliance to the rules as defined by ORC is not applicable to exclusion pests since ORC has full responsibility to control exclusion pests where incursions occur.

Table 10: Assessment of ORC activities (exclusion programme)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>Activity: Cross-boundary training between ORC and Environment Canterbury on, for example, Chilean needle grass, which is more common in Canterbury. This knowledge sharing fosters ORC capabilities in identifying and dealing with potential incursions.</li> <li>Activity: Cross-border information sharing of pest incursions supports the management of exclusion pests that are more common in, for example, Canterbury, but not present in Otago.</li> <li>Activity: ORC has developed a monitoring and control plan for exclusion pests in 2024.</li> <li>Outcome: No presence of African feather grass at known historical sites.</li> </ul>	<ul style="list-style-type: none"> <li>Activity: Improvements could be made in the pest pathway management between councils, especially for established pests creeping into boundaries towards Otago.</li> </ul>

#### Effectiveness of the RPMP

While data has a degree of uncertainty, the initiative of cross-boundary engagement between especially Environment Canterbury and ORC as well as the absence of exclusion pests can indicate, that the RPMP is **effective** in meeting the pest objectives of exclusion pests. We note a degree of uncertainty in this assessment as ORC’s surveillance is not comprehensive.

### Suggestion to improve RPMP effectiveness

- Activity: Certainty of incursion risks and readiness for incursions could be improved by focusing on an additional activity: implementing annual cross-boundary programmes between neighbouring councils, especially with Environment Canterbury. This could take the form of developing a joint pest pathway management programme, initially focusing on more dominant pests in border regions, such as noted Chilean needle grass in Canterbury, between councils (Southland, Otago, and Canterbury), to understand pest movement and incursions over time and target identified areas. The latter point was raised by stakeholders as a potential improvement.

### 5.3.3 Eradication programme

Eradication pests include wallabies, rooks, and spiny broom. Below, we provide a breakdown of our assessment by specific pests.

#### Wallabies

**Assessment finding:** ORC is **effective** in informing the Otago community on the wallaby threat. Currently, ORC is **not effective** in achieving stated RPMP objectives to reduce the known wallaby population to zero density and prevent further spread of wallabies into North Otago from Canterbury.

#### Data assessment

No wallabies were reported in iNaturalist data, neither before nor after the inception of the current RPMP. A significant part of ORC's RPMP work on wallaby eradication is delivered through the national wallaby programme. We have received from ORC maps of Otago showing wallaby tracking and reported wallaby sightings from the wallaby information system (Wall-IS) (see Figure 11).

- In 2021/22, 10 wallabies were reported (seven confirmed dead wallabies, and three confirmed sightings); in 2022/23 another 10 wallabies were reported (five confirmed dead wallabies and five confirmed sightings); in 2023/24, 20 wallabies were reported (10 confirmed dead wallabies and 10 confirmed sightings). These numbers can suggest that wallaby numbers in Otago are on the rise over the last three years.
- Inspecting the maps, it is noticeable that wallaby reporting has moved deeper into Otago. This may suggest that wallabies have become more established in Otago, and that they are no longer just a cross-border issue between Otago and Canterbury.

Further, ORC made the following observation in their Environmental Implementation Committee Report (Wallabies) (2024), showing similar increasing trends of confirmed sightings.

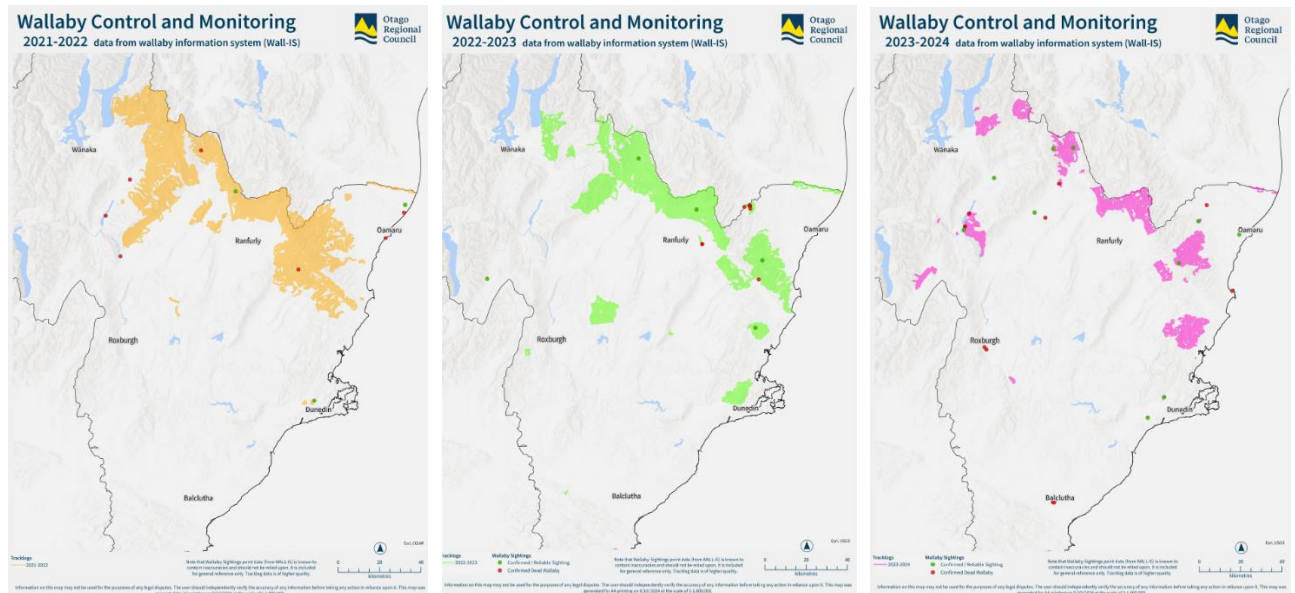
Table 11: Unconfirmed and credible wallaby sightings in Otago 2020-2024

Year	Unconfirmed sightings	Credible sightings
2020/21		8
2021/22	13	24
2022/23	13	35
2023/24 <sup>7</sup>	15	38
<b>Total</b>	<b>41</b>	<b>105</b>

Source: ORC Environmental Implementation Committee Report (Wallabies), 2024

This data could indicate a lack of effectiveness of the RPMP through the national wallaby programme in eradicating wallabies in Otago, however, it is important to interrogate the data. Reporting relies on public awareness, and a possible explanation for the increased reporting could be due to improved public awareness through the RPMP. However, without a baseline, this is hard to assess and leaves uncertainty.

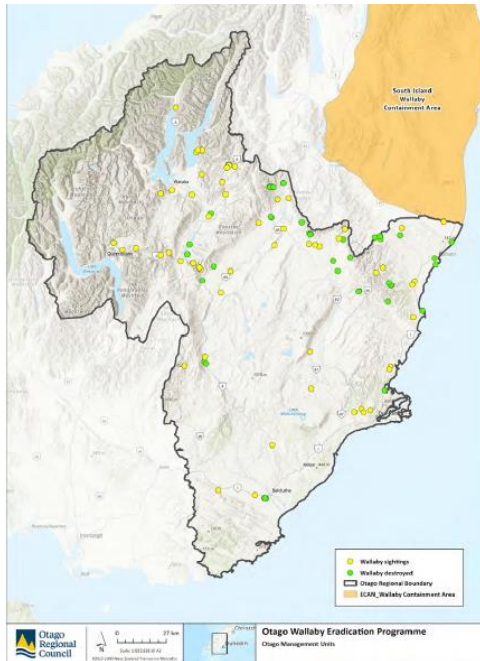
Figure 11: Wallaby control and monitoring in Otago 2021-2024



Source: ORC provided maps

<sup>7</sup> As of 31 March 2024.

Figure 12: Wallaby sightings and wallabies destroyed: 1 July 2020 to 31 March 2024



Source: Environmental Committee Report Wallabies 2024

RPMP rules require the public to act on wallabies. There is limited compliance data collected for wallabies, likely because wallabies have little presence in the region and the national programme would take control and support landowners to achieve compliance, rather than ORC.

Table 12: Assessment of ORC activities (wallabies)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>Input and activity: Stakeholders noted that it is important that the RPMP includes wallabies as an eradication species. This provides ORC funds to support the national programme and provides ORC access to operate on private land and allocate resources to education and awareness campaigns.</li> <li>Activity: Stakeholders noted in terms of specific activities that ORC has undertaken good education efforts under the RPMP in raising public awareness of the pest (e.g. school visits) and the need to report the pest where observed.</li> <li>Activity: Other important and improved noted activities by ORC are the efforts to consider wallabies as a cross-boundary issue between Canterbury and Otago, driven by the national wallaby programme in which the RPMP links. This is supported by, for example, the 31 engagement activities between ORC and</li> </ul>	<ul style="list-style-type: none"> <li>Containing wallabies is challenging due to the movement of wallabies of up to 9km per day, and the incursion risk from Canterbury into Otago. Only few wallabies are observed in Otago over large landscapes—they are hard to find, and a lot of effort is spent by ORC to find these last few.</li> <li>Input: We received feedback from ORC staff that current resourcing for wallaby service delivery would need to more than double (from 1.5 full-time equivalent (FTE) to 5 FTE) to effectively deliver on the RPMP objective to eradicate wallabies in Otago. We note that ORC significantly increased investment from \$191,096 in 2020/21, to \$1,503,348 in 2022/ (Environmental Implementation Committee, 2024). However, a recent report identified that current funding is indeed too little to maintain gains and progressively eradicate wallabies in Otago, stating that \$1.4 million is needed</li> </ul>

Effective aspects	Less effective aspects
<p>Environment Canterbury on wallabies in FY2023/24 (Otago Regional Council, 2023a).</p> <ul style="list-style-type: none"> <li>• Activity: There are positive changes in approaches undertaken by ORC. ORC is responding to the challenges in identifying wallabies across Otago by looking at research and development trials to effectively search for remaining wallabies. Such trials include using Judas wallabies (tagging a wallaby and using it to lead the team to other wallabies present in the area), MPI eDNA research, and MPI wallaby detection probability trials.</li> <li>• Output: ORC is effective in responding to wallaby sightings within a set timeframe, responding to 93 per cent of reported sightings within three days of the sighting (Otago Regional Council, 2023a) which is important to track down the wallaby.</li> </ul>	<p>annually as opposed to the proposed funding of \$850,000 for the FY2024/25 (Environmental Implementation Committee, 2024).</p> <ul style="list-style-type: none"> <li>• Activity and output: The key challenge is to locate and kill wallabies, posing a significant risk to the goal of eradication. We note that more effective methods as trialled by ORC at present (see above Judas wallabies or MPI eDNA) have scope for overcoming the noted resource constraint.</li> <li>• Activity: It was noted by stakeholders that there is an opportunity for better data sharing to improve targeting of pests and specifically wallabies that can quickly cross borders between councils.</li> </ul>

### Effectiveness of the RPMP

At present, when incorporating the findings from stakeholder feedback and the data, we argue that ORC is **not effective** in meeting the eradication target for wallabies under the current RPMP. However, we also acknowledge that the investment made by ORC, especially into trialling advanced methods to track down wallabies effectively, show promise to get back on track. Using stakeholder findings, it is evident that ORC is effective in raising awareness of the wallaby threat among the Otago community.

### Suggestions to improve RPMP effectiveness

- Activity: Wallabies are an established pest in Canterbury. As noted for exclusion pests, benefits can arise from establishing a pathway management programme to improve dealing with the cross-border issue.
- Activity: Building on the conducted trials which can provide a cost-effective approach to tracking wallabies across the large landscape of Otago, i.e. finding a needle in haystack, allocating resources towards the most promising method to identify wallabies. Trials using Judas wallabies have shown promise (Environmental Implementation Committee, 2024).  
We note that this requires sustainable funding support. It is important to establish a strategy of how to implement the trialled approaches and to act swiftly on it. Targeting clusters or geographies of increased reporting could be one approach. This should be a priority for ORC/the national wallaby programme in Otago.
- Input: Requirement for a funding uplift for wallaby eradication as noted in ORC's Environmental Implementation Committee Report – Wallaby Programme Update and

Recommendations (2024), to implement the targeted control of the limited wallaby populations in Otago.

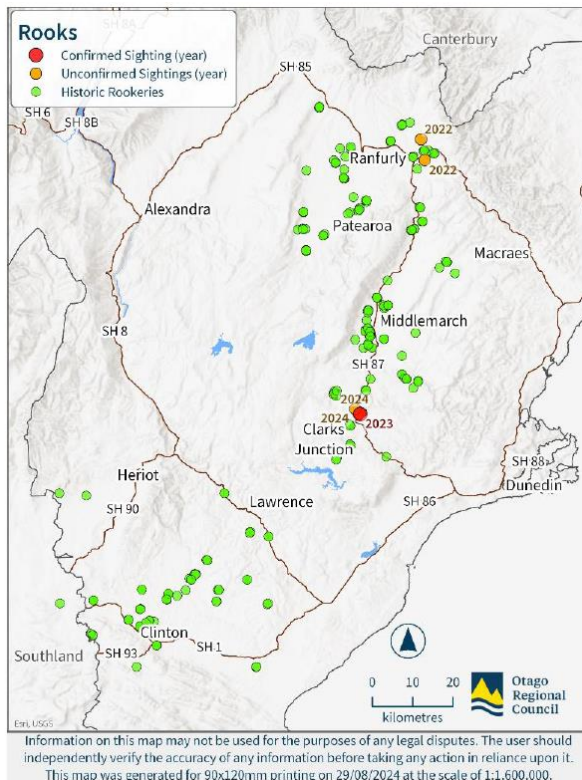
## Rooks

**Assessment finding:** ORC is **effective** in achieving the stated RPMP objective to reduce rook populations to zero density, within the RPMP period and are on track to maintain this status until eradication is attained.

### Data assessment

No rooks are reported in iNaturalist. ORC data in Figure 13 shows that in the last five years, there has been only one confirmed rook sighting (2023), and no active nesting sites were observed at historic rookeries (BioLink Consulting, 2024b). The data suggests that ORC have been effective within the RPMP in their efforts to eradicate rooks at known sites.

Figure 13: Rook sightings



Source: ORC Monitoring and Surveillance Guidance Document, 2024

Table 13: Assessment of ORC activities (rooks)

### Effective aspects

- Stakeholder feedback states that ORC are doing a good job, and that the eradication is on a successful trajectory.
- Activity, output, outcome: Successes are noted in raised awareness of rooks as a pest. The pest of the month programme was deemed successful for raising awareness of rooks.

### Effectiveness of the RPMP

- ORC is **effective** in achieving the stated RPMP objective to reduce rook populations to zero density, within the RPMP period and maintain this status until eradication is attained.
- The RPMP is effective in eradicating rooks as shown by the data and heard from stakeholders.
- Monitoring is in place to identify rooks at known sites. Where sightings were present, ORC responded within set timeframes and targets as per ORC KPI information (Otago Regional Council, 2022, 2023a).

### Suggestions to improve RPMP effectiveness

- Continue status quo approach as ORC are implementing the RPMP objective of rook eradication effectively.
- Activity: We suggest using rook eradication efforts and communication approaches as a case study to gain support from the public for efforts made by ORC in implementing the RPMP.

### Spiny broom

**Assessment finding:** ORC is **effective** in achieving the stated RPMP objective to reduce spiny broom populations to zero density, within the RPMP period and maintain this status until eradication is attained.

### Data assessment and stakeholder feedback

No spiny broom was reported in iNaturalist. We provide a case study below, highlighting ORC's approach, and ORC's effective activities. No stakeholder feedback was provided on spiny broom.

### Suggestion to improve RPMP effectiveness

- Continue status quo approach as ORC implement the RPMP objective of spiny broom eradication effectively. We support ORC's improved monitoring planning to monitor spiny broom beyond known sites.

**Case study: Spiny broom**

The goal is to reduce infestations of spiny broom to zero.

KPIs for spiny broom include:

- conducting inspections at known and potential infestation sites
- initiating control actions within five or 10 days of a confirmed sighting
- submitting a report on current infestation levels and high-risk sites.

There are three known sites of spiny broom in Otago: Chain Hills Road, Waihola, and the Ocean View Reserve. An ORC biosecurity officer monitors and controls spiny broom at these three sites on an ad hoc basis, ensuring coverage at least twice annually. For example, during 2021/22, an officer conducted 13 inspections, with spiny broom found during two. In both cases, the officer GPS-marked the location and removed the plant by hand pulling.

Since 2019, 17 plants have been found and removed across the three sites. These actions, coupled with the associated reporting written, suggest that the KPIs were met. ORC have undertaken additional surveillance activity beyond these known sites, around Dunedin's western and southern suburbs.

The Biosecurity Operational Plan 2024-2025 outlines the objectives and monitoring actions for spiny broom in 2024/25 (Otago Regional Council, 2024a). Thirteen monitoring and surveillance visits are planned for known sites and surrounding areas. These visits aim to delineate site boundaries and improve ORC's understanding of the plant's prevalence.

### 5.3.4 Progressive containment programme

Progressive containment pests include African love grass, bomarea, boneseed, bur daisy, cape ivy, Nassella tussock, old man’s beard, perennial nettle, spartina, wilding pines, and white-edged nightshade.

The RPMP objectives are to contain their presence in the region (for African love grass, limited to 20 known sites; for wilding conifers, in alignment with the national strategy), reduce their densities and prevent their spread to new locations/sites/areas.

We present observations and compliance data for bomarea, old man’s beard and wilding pines. There is compliance data for African love grass, boneseed, bur daisy, cape ivy, Nassella tussock, perennial nettle, and spartina. There was no compliance data for white-edged nightshade at the time Sapere requested data from ORC.

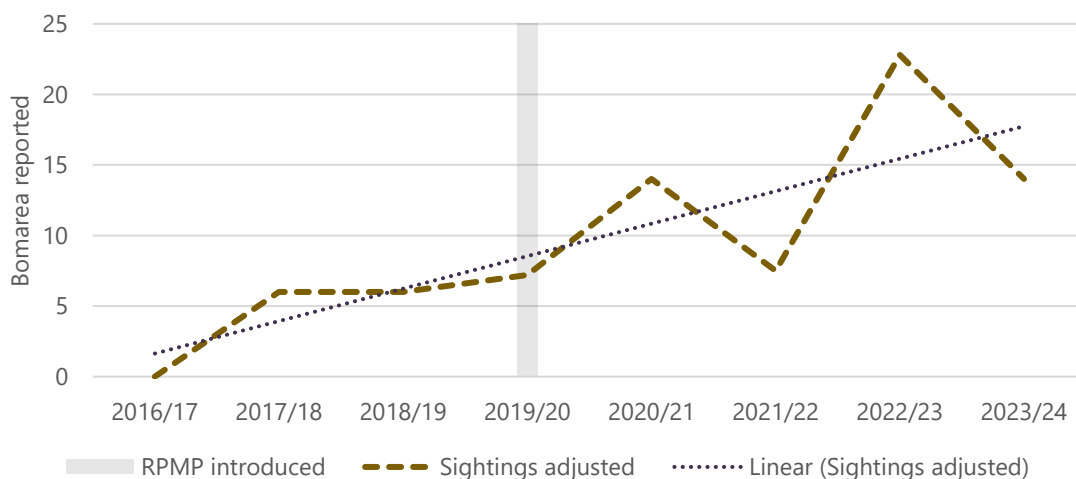
#### Bomarea

**Assessment finding:** ORC is **not effective** in meeting the RPMP objective.

#### Data assessment

Figure 14 shows sightings of bomarea. There is a clear increasing trend in sightings over time, however, the trend needs to be interpreted with caution. We note that most of the recent sightings in the last two reported financial years are localised and reported on the Otago Peninsula.

Figure 14: Bomarea observations



Source: Sapere calculations using iNaturalist data

There can be different reasons explaining this localised increase of sightings. For example, bomarea could indeed be a local Otago Peninsula pest problem compared to the rest of Otago, although the monitoring activities and inspections carried out by ORC within the RPMP in the Dunedin area point to other explanations.

Such explanations could relate to the notable monitoring and surveillance activities conducted by ORC around Dunedin in the last two financial years. These activities could have increased awareness, reporting, and identification of bomarea. Another explanation could relate to groups involved in site-led RPMP activities in the Otago Peninsula area, funded by ORC, which increased their activities in searching and identifying bomarea.

Compliance data for bomarea shows that in 2021/22, 30 per cent of landowners were compliant at an inspection and 80 per cent at re-inspection (see Figure 17). We note that when using the before-and-after data for bomarea from 2022 to 2024, only 16 per cent (one out of six) are compliant at reinspection, with the caveat of significantly less observations (12 before-and-after observations), compared to the 2021/22 data which includes 169 re-inspections for bomarea.

Table 14: Assessment of ORC activities (bomarea)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>Activity and output: Feedback from local councils showed effective processes of communication in notification of bomarea presence by ORC, following their monitoring activities, to the local council. From there, the local council engages with contractors to carry out pest management.</li> </ul>	<ul style="list-style-type: none"> <li>Activity and outcome: Stakeholders noted the bomarea situation in Otago is challenging, especially in the area around Dunedin. Stakeholders further noted that current activities are not enough to meet the objective under the RPMP. They specifically stated that bomarea will keep on spreading on landowners' properties if ORC does not get involved. We note that service delivery is not a requirement for ORC under the RPMP, although the RPMP requires the landowner/occupier to act. However, where failure to act (following inspection, re-inspection and NoDs) can lead to more enforcement, and ORC carrying out the work and recuperating the cost from the landowner.</li> <li>Input, activity, output and outcome: Stakeholders also noted the ineffectiveness of inspections and re-inspections carried out by ORC. This is supported by the reviewed compliance data, which suggest that compliance to inspections and re-inspections is low. We also note that re-inspections for bomarea among the six other containment plants missed KPIs set by ORC—in 2023/24, 67 per cent of the targeted 100 per cent of non-compliant properties were reinspected (Otago Regional Council, 2023a).</li> </ul>

### Effectiveness of the RPMP

Combining the findings, we assess ORC as **not effective** in their activities to meet the objectives for bomarea under the RPMP.

### Suggestion to improve RPMP effectiveness

- Input and activity: Carrying out more inspections and re-inspections seems inefficient without enforcing compliance. We suggest ORC focus on enforcement where failure to comply occurs alongside increasing new inspections and re-inspections.
- Enforcement is key to get on a successful containment pathway for bomarea. We suggest following the approach stated by a local council in Otago which provides landowners/occupiers with a set time frame to remove the pest. If this is not achieved, the local council commissions contractors to carry out the work and shares an invoice with the landowner. This approach seems to be timely, from notification to pest control, avoiding further spread of the pest.
- Activity, output and outcome: Following the local council example, for successful enforcement ORC needs to provide clear timelines alongside messaging that if the timelines are not met, ORC will commission the requirement to act to a contractor, at a fee which the landowner will have to cover under the Act.

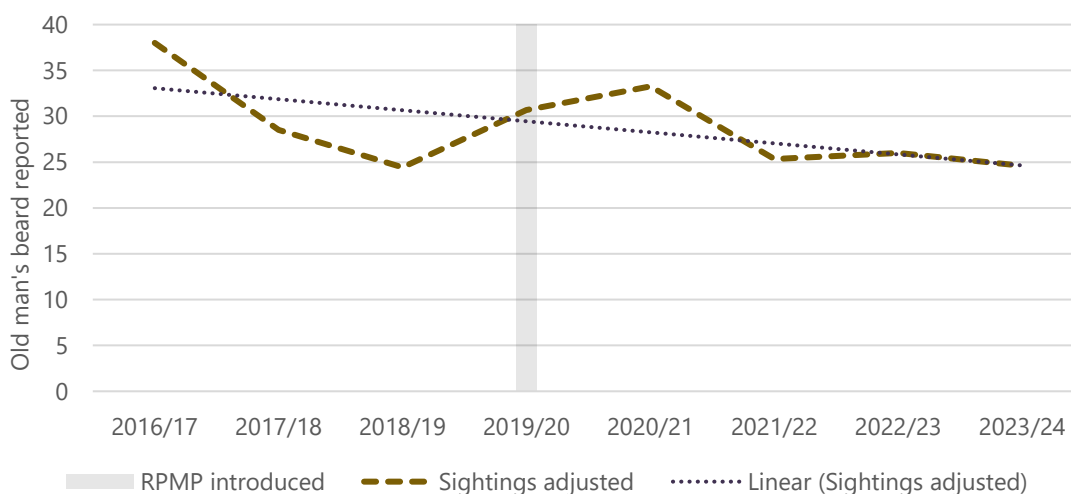
### Old man's beard

**Assessment finding:** ORC is **not effective** in meeting the RPMP objectives.

#### Data assessment

Figure 15 shows the sightings of old man's beard from 2016/17 to 2023/24. The number of sightings show little change in the most recent reported financial year 2023/24 compared to reported levels prior to the inception of the current RPMP in 2018/19. This data can indicate that progressive containment is not achieved. We note that while a useful indication, we cannot determine whether this is driven by the RPMP.

Figure 15: Old man's beard observations



Source: Sapere calculations using iNaturalist data

Looking at inspection and compliance data, there were 671 inspections of properties for old man’s beard in 2021/22. 183, or 27 per cent, were found to be compliant. In the same year, there were 414 re-inspections of properties with old man’s beard, with 305, or 74 per cent, found to be compliant. This finding suggests that non-compliant properties make efforts to remove old man’s beard. However, we note that when using the before-and-after data from 2022 to 2024, only 22 per cent (two out of nine) are compliant at re-inspection with the caveat of significantly less observations (only nine observations).

Recent KPI data from ORC indicates that re-inspection targets were not fully met, achieving 83 per cent of the intended 100 per cent (Otago Regional Council, 2023a).

However, old man’s beard accounts for most biosecurity inspections, with approximately 790 inspections in 2024 alone—twice as many as bomarea, the second most inspected species that year. This high volume makes achieving the 100 per cent target particularly challenging.

Table 15: Assessment of ORC activities (old man’s beard)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>• Activity, output: ORC has carried out a significant number of old man’s beard inspections since the inception of the RPMP, particularly around roadside areas and in and around the Dunedin area.</li> <li>• ORC aims to address the challenge of overburdening numbers of property inspections by applying prioritisation in the financial year 2024/25. In doing so, ORC aims to focus on inspections of properties in and surrounding high biodiversity areas.</li> <li>• Activity: ORC is distributing/releasing biocontrol agents which limit the pest vigour.</li> <li>• Activity, output, outcome: Interviews highlighted that old man’s beard inspections facilitate control action of other local authorities, such as of some local councils or other public sector entities responsible for the management for road and rail verges.</li> <li>• Outcome: These organisations stated that there is awareness of the old man’s beard issue (also as it is a legacy pest), and that they act to control the pest once notified by ORC.</li> </ul>	<ul style="list-style-type: none"> <li>• Public organisations raised concerns about compliance, particularly when control actions were undertaken by these organisations, but neighbouring properties did not follow suit (under good neighbour rule requirement), leading to reinfestation.</li> <li>• Outcome: Compliance challenges are also evident in our assessment of compliance data presented above (22 per cent compliance at re-inspections using most recent data from 2022 to 2024).</li> <li>• Outcome: Feedback from stakeholders highlighted limited results in the Clutha catchment, where the species has become naturalised. The RPMP has not been successful in this area.</li> <li>• Activities, output, outcome: Stakeholders also raised concerns about inefficiencies in the inspection process. Previously, inspections for old man’s beard could be conducted independently, but now the process requires tagging the site, arranging for a contractor, and conducting follow-up inspections. This has increased the number of site visits, whereas in the past, the process could often be completed in a single visit. We note that in the past, ORC delivered the service. Under the current RPMP, ORC is not responsible for service delivery. Landowners are required to act, and the good neighbour rule remains in place. Changes to</li> </ul>

Effective aspects	Less effective aspects
	service delivery would require more budget for old man's beard.

### Effectiveness of the RPMP

ORC has made significant investments in biosecurity inspections for old man's beard. While these efforts have been beneficial for several public sector stakeholders, the inspections have shown limited effectiveness in achieving the pest management objective. This is evident from the stagnation in old man's beard observations, as presented in our data, and the low compliance rates following ORC inspections. We conclude that ORC's activities are **not effective** in meeting the pest objective for old man's beard.

### Suggestion to improve RPMP effectiveness

- Input and activity: As for other pest plants under progressive containment, the key to improve effectiveness in meeting pest objectives is compliance enforcement. This is especially important for old man's beard as landowners are required to act and as the good neighbour rule applies. Without credible enforcement, those rules lack impact. Consequentially, effectiveness of the pest objective is less likely to be achieved.

## Wilding pines

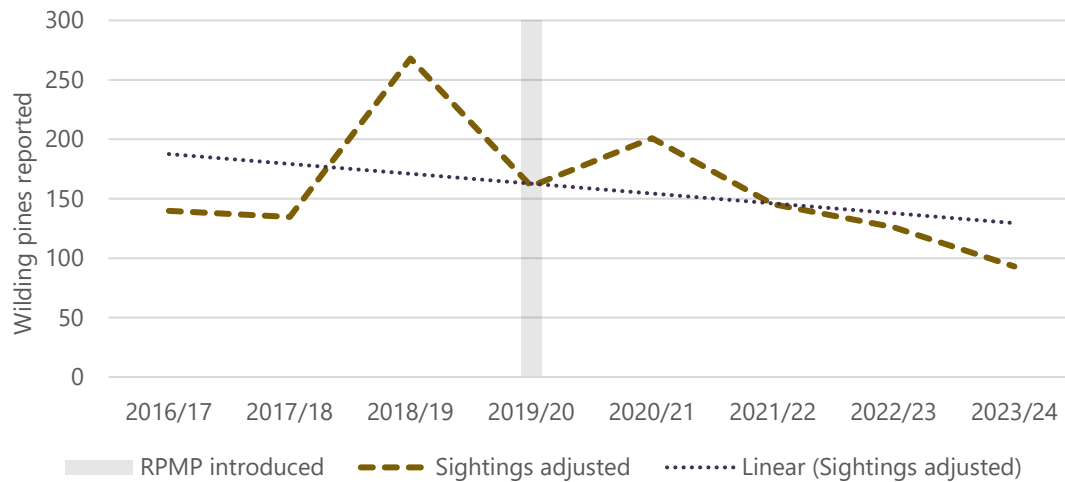
**Assessment finding:** ORC is **partially effective** in meeting the RPMP objectives.

### Data assessment

Figure 16 shows the reported observations of wilding pines from 2016/17 to 2023/24. Following the introduction of the RPMP in 2019/20, a declining trend of observations is apparent. As above, we note that the decline is likely a combination of the RPMP acting alongside the National Wilding Conifer Control Programme, and various community groups involved.<sup>8</sup> However, the decline in wilding pines is noticeable comparing before-and-after RPMP inception observation numbers. This can suggest efficiencies of ORC in contributing to progressively containing wilding pines in Otago. We further note that substantial progress was made when there was additional funding from the Jobs for Nature scheme (Bowman, 2024).

<sup>8</sup> The community-based groups include the Wakatipu Wilding Conifer Control Group and the Central Otago Wilding Conifer Control Group, which champion work programmes in their areas, as well as government agencies (MPI, DOC, and Land Information New Zealand (LINZ)) and local government (the Queenstown-Lakes District Council, Central Otago District Council and Otago Regional Council).

Figure 16: Wilding pine observations



Source: Sapere calculations using iNaturalist data

Twelve properties were inspected for wilding pines in 2021/22, and five (42 per cent) were found to be compliant. One re-inspection was conducted with an unclear outcome. Inspections increased over the course of the RPMP. 103 inspections for wilding conifer compliance were carried out in the financial year 2023/24, however, the report does not state how many of those inspections identified compliant and non-compliant properties (Otago Regional Council, 2023a). 103 inspections for wilding conifer compliance were carried out in the financial year 2023/24, however, the report does not state how many of those inspections identified compliant and non-compliant properties (Otago Regional Council, 2023a). ORC notes in the report that the complexity of rules posed a challenge to determining compliance.

Table 16: Assessment of ORC activities (wilding pines)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>Outcome: Stakeholders noted that public awareness around the issue of wilding pines has improved significantly. They noted that the RPMP has likely contributed to the increase in awareness.</li> <li>Activity, Output, Outcome: Some stakeholders stated that ORC cooperates well with landowners, and that this cooperation has been effective in managing wilding pines in some areas. But they also noted that this approach is now being tested as the focus shifts more to urban areas.</li> </ul>	<ul style="list-style-type: none"> <li>There was clear stakeholder criticism of the interpretation of rules. The rules were critically assessed as being unclear. Several stakeholders noted that the 200m buffer rule for wilding pines is inadequate, as seeds can spread up to 30km. One stakeholder noted a 2km rule would be more appropriate.</li> <li>Activity: It was also raised that stricter regulations on new plantings are required, as otherwise the problem will persist.</li> <li>Input, activity, output: A common criticism of ORC's current activities within the RPMP objective is the lack of enforcement. It was stated that ORC needs to take a more proactive approach, ensuring effective enforcement is in place to justify the heavy investment some</li> </ul>

Effective aspects	Less effective aspects
	<p>landowners are undertaking to control wilding pines.</p> <ul style="list-style-type: none"> <li>• Outcome: There is a risk to sustaining current investments in wilding pine control. Government funding cuts to the National Wilding Conifer Programme have significantly reduced control efforts, leaving insufficient resources for maintenance.</li> </ul>

### Effectiveness of the RPMP

Awareness among the public of the wilding pine issue has increased which is a success for ORC. Partial effectiveness was achieved in some areas, and there is a downward trend in reported wilding pines in Otago. However, the downward trend is unlikely solely attributable to the RPMP. Stakeholders pointed out significant inefficiencies of the RPMP in meeting its progressive containment targets, specifically relating to the lack of clarity of the rules, compliance and enforcement. This suggests that key components of the logic model for effective outcomes are missing for some stakeholders and populations. Considering this, the RPMP seems to be beneficial for certain stakeholders in some areas of Otago, while challenges are evident, especially around the good neighbour rule. Consequentially, we assess that ORC is **partially effective** in delivering the RPMP objective for wilding pines.

### Suggestion to improve RPMP effectiveness

- Activity and output: ORC needs to take a more active role in helping landowners understand the rules. This could be achieved through a targeted communication campaign in collaboration with leading wilding pine groups in Otago. However, this would only partially address the issues raised, as a key challenge remains the stated ineffectiveness of the current rules. We acknowledge that these rules would only be subject to revision in the next iteration of the RPMP.
- Input and activity: ORC should adopt a more proactive approach to compliance enforcement. This could involve prioritising areas with high biodiversity value or where landowners have made significant investments in controlling wilding pines, ensuring a fair and balanced approach.
- Input: Resources for enforcement should be increased. While government funding cuts have reduced control efforts, ORC could consider increasing rates to better support enforcement resourcing. If feasible, landowners who have made substantial investments in control actions should be exempt from any rate increases.

## African love grass, boneseed, bur daisy, cape ivy, Nassella tussock, perennial nettle, and spartina

### Assessment findings:

- **Spartina:** ORC is **effective** in meeting the objectives of the RPMP
- **African love grass** and **Nassella tussock:** ORC is **partially effective** in meeting the objectives of the RPMP.
- **Boneseed, bur daisy, cape-ivy, perennial nettle, white-edged nightshade:** Information is too limited to make an informed judgment on the effectiveness, as such: ORC effectiveness is **inconclusive**.

### African love grass observations

The known distribution of African love grass in Otago is limited to approximately 20 sites in the vicinity of Alexandra and Cromwell, in Central Otago. The RPMP focuses on these sites. Most occurrences are smaller infestations ( $\leq 20$  plants). ORC data records that the plants were grubbed when present (BioLink Consulting, 2024b).

Recent feedback from ORC indicates some minor spread has happened in the vicinity of a few sites, but at other known sites African love grass has been contained and controlled. A feasible explanation is that dormant seeds (up to seven years) could have been spread by rail, cyclist or agricultural vehicles as observations outside of known sites are found at road verges and near cycle trails.

### Nassella tussock observations

Nassella tussock is currently known to occur within four areas, centred around Roxburgh, Alexandra, Cardrona and Waitaki Valley. Infestations are a mixture of dense and scattered populations, across pastoral hill country farmland (approximately 20 properties). Due to their scale and challenging terrain, the entirety of these properties has not been surveyed, and therefore the full extent of infestation at each property is not known. Nassella tussock seeds can remain dormant in the soil for up to 20 years. Thus, even if areas appear controlled, re-infestation can occur over time. Very limited surveillance has been undertaken outside these areas (BioLink Consulting, 2024b).

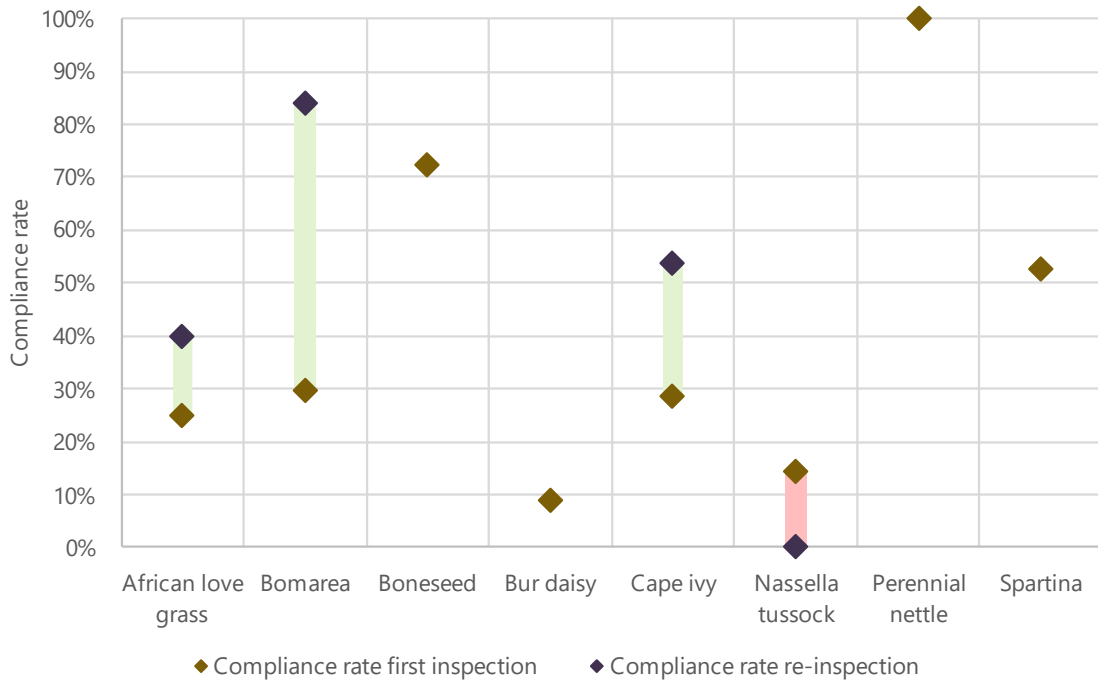
There is limited reporting in iNaturalist between 2016/17 and 2023/24 of Nassella tussock (one observation in 2020/21 and two observations in 2021/22).

### Other plant pests

There are similar low observations for spartina, which is only observed once in 2023/24 in iNaturalist (and supported by the case study below), and perennial nettle and white-edged nightshade, which have zero observations in iNaturalist over the period from 2016/17 to 2023/24.

The 2021/22 compliance data for the remaining progressive containment pests is summarised in Figure 20. Pests with high compliance rates at first inspection—boneseed, bur daisy, perennial nettle, and spartina—did not have re-inspections. Of the four pests that had re-inspections, three had higher compliance rates at the re-inspection. Only Nassella tussock did not present an increase, with all six re-inspections being found to be non-compliant. However, as noted above, Nassella tussock has a long seed life which increases the challenge of controlling this plant pest significantly.

Figure 17: Compliance for remaining progressive containment pests in 2021/22



Source: Sapere calculations using ORC data

### Case study: Spartina

The primary goal is to reduce and contain spartina within the Otago region (progressive containment). However, in some low incidence areas, the focus can shift to an eradication approach.

KPIs for spartina include:

- conducting inspections at known and potential infestation sites
- hiring contractors to provide direct control
- holding meetings with DOC and KiwiRail.

ORC and DOC manage spartina monitoring and control in separate areas. ORC manage spartina at four known sites: Pleasant Point River Estuary, Hawksbury Lagoon, Waikouaiti River Estuary, and Blueskin Bay. They also oversee a site that had plants removed in 1995.

ORC biosecurity officers monitor spartina at known sites twice a year. When a plant is found, the officer marks the plant using tape and records its GPS location for contractors to control at a later point.

ORC have provided us several photos of successful control operations. These suggest that control has been successful where implemented. An example for Pleasant Point River Estuary is shown below (left photo before intervention and right photo after intervention).



Going forward, ORC must ensure that monitoring, surveillance, and control activities are comprehensive and maintained, within the available resources. To achieve this, specific actions have been planned, including a KPI of conducting 12 monitoring and surveillance visits, and a planned survey of the operational area.

Table 17: Assessment of ORC activities (other plant pests)<sup>9</sup>

Effective aspects	Less effective aspects
<p><i>Bur daisy</i></p> <ul style="list-style-type: none"> <li>Activity, outcome: Stakeholders noted improvements in bur daisy control in cross-boundary areas with Canterbury. ORC's collaboration with Environment Canterbury has been effective, particularly in managing cross-boundary issues. Meetings with ORC have been held to address these concerns.</li> </ul> <p><i>Nassella tussock, spartina, African love grass</i></p> <ul style="list-style-type: none"> <li>Input and activity: ORC have strengthened their strategic planning around Nassella tussock, spartina and African love grass monitoring and surveillance with the development of a monitoring and surveillance action plan (BioLink Consulting, 2024a).</li> </ul> <p><i>Nassella tussock</i></p> <ul style="list-style-type: none"> <li>Input and activity: ORC has made recent efforts and investments into Nassella tussock monitoring and surveillance.</li> <li>Output: A positive output relating to those efforts was achieved in the financial year 2023/24 when all 38 known Nassella tussock sites and surrounding locations in Otago were inspected and surveyed (Otago Regional Council, 2023a).</li> </ul> <p><i>Spartina</i></p> <ul style="list-style-type: none"> <li>Activity: ORC biosecurity officers monitor spartina at known sites twice a year. When a plant is found, the officer marks the plant using tape and records its GPS location for contractors to control at a later point.</li> <li>Activity: Successful forward planning of pest monitoring as per ORC which includes a KPI of conducting 12 monitoring and surveillance visits, and a planned survey of the operational area.</li> <li>Outcome: ORC have provided us several photos of successful control operations. These suggest that control has been successful where implemented.</li> </ul>	<p><i>Nassella tussock</i></p> <ul style="list-style-type: none"> <li>Outcome: While improvements have been made in monitoring and surveillance, stakeholders noted that recent mapping efforts in key valleys have revealed significantly more Nassella tussock than previously recorded, suggesting that many pests may be underreported due to gaps in detection and a shortage of trained staff.</li> <li>Input: Monitoring Nassella tussock is highly resource intensive. While advancements in AI and satellite imagery offer promising solutions, fieldwork remains essential for accurate assessments. The time required for on-the-ground monitoring often exceeds available resources.</li> </ul> <p><i>All plants</i></p> <ul style="list-style-type: none"> <li>Outcome: Compliance levels are low following inspections and re-inspections, posing a risk to the investment efforts made by ORC but also involved stakeholders. Latest KPI data from ORC shows that re-inspection targets for spartina, boneseed, bur daisy, cape ivy, perennial nettle and white-edged nightshade were not met (67 per cent out of 100 per cent target) (Otago Regional Council, 2023a).</li> </ul>

<sup>9</sup> We note that stakeholder feedback was limited to bur daisy and Nassella tussock.

Effective aspects	Less effective aspects
<p><i>African love grass</i></p> <ul style="list-style-type: none"> <li>Activity: ORC is partially effective in service delivery at 20 known sites, i.e. grubbing and removing when present. ORC provided feedback that while at known sites, control measures indicate success, minor spread outside of known sites has been recently identified in ORC biosecurity inspections.</li> </ul> <p><i>Boneseed, cape ivy, perennial nettle</i></p> <ul style="list-style-type: none"> <li>Limited information to make an informed assessment.</li> </ul>	

### Recommendations to improve RPMP effectiveness

- Input, activity, output: While ORC have strengthened their strategic planning around Nassella tussock, we recommend considering the use of aerial surveillance and remote sensing. Increased aerial monitoring could significantly improve efficiency. For example, multiple sites could be covered via aerial surveys within days, where this would take months and significant financial investment to achieve through ground-based inspections alone.
- Input, activity, output: For all discussed pests: Strengthen enforcement of compliance, by stating clear timelines to landowners to remove pests, and the costs they will incur if they have not removed the pest within the given timeframe due to ORC having to contract pest control.

### 5.3.5 Sustained control programme

Pests in the sustained control programme include gorse and broom, feral rabbits, nodding thistle, ragwort and Russell lupin.

We identified observation and compliance data was available for all sustained control programme pests, excluding Russell lupin, which had only observational data.

#### Gorse and broom

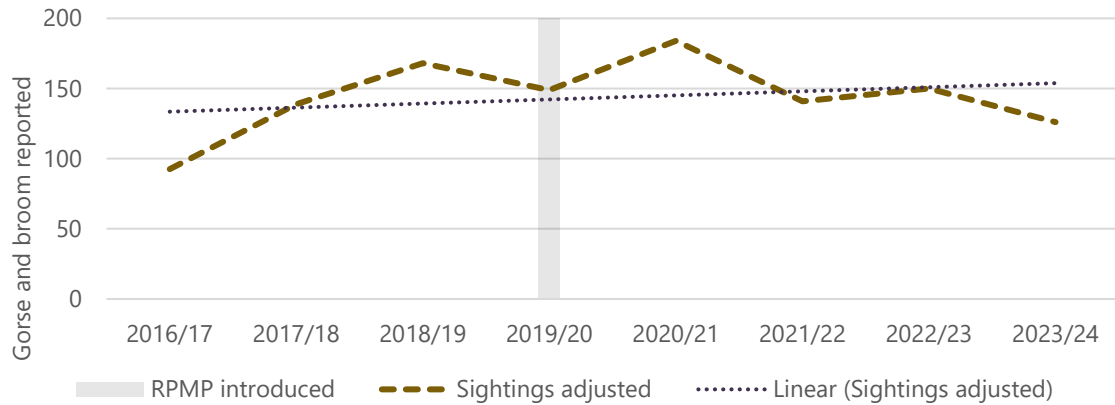
The RPMP objective of gorse and broom is to ensure continuing control of gorse and broom, that prevents land which is free of these pests becoming infested. ORC has the ambition to eradicate gorse and broom in existing free areas.

**Assessment findings:** ORC is **not effective** in meeting the objectives of the RPMP.

#### Data assessment

Figure 18 shows the observations of gorse and broom from 2016/17 to 2023/24. There was a reasonable increase in gorse and broom observations until 2020/21, with decreases thereafter.

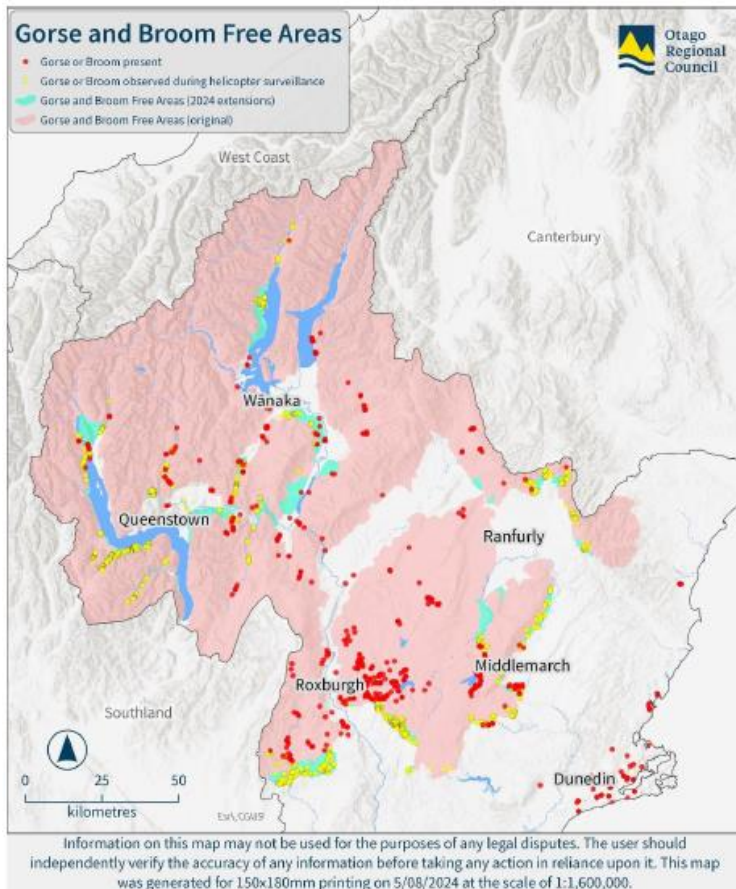
Figure 18: Gorse and broom observations



Source: Sapere calculations using iNaturalist data

Looking at ORC data, gorse and broom are present in both the original gorse and broom free areas (GABFAs) and the extension areas. While the full extent and distribution of infestations remain unknown, aerial surveys conducted in 2022 to 2023 identified infestations in both the original GABFAs and the newly designated areas.

Figure 19: Detected gorse and broom presence in Otago GABFAs over time



Source: ORC Monitoring and Surveillance Guidance Document, 2024

In 2021/22, there were 124 inspections of gorse and broom. Eleven, or 9 per cent, of these were found to be compliant. There were eight re-inspections of properties – three, or 38 per cent, were compliant. While an increase since initial inspections, compliance across both first inspections and re-inspections is low.

Low compliance could be explained by resource allocation. Some stakeholders noted that ORC could improve resourcing to enforce compliance, with gorse and broom cited specifically. This is also captured in ORC feedback on gorse and broom inspections, and ORC missing most recent KPI targets on re-inspection of non-compliant properties in gorse and broom free areas (56 per cent were re-inspected, while the target was 100 per cent(Otago Regional Council, 2023a). ORC feedback stated that gorse and broom were less prioritised in recent work planning, explaining the low compliance numbers.

Table 18: Assessment of ORC activities (gorse and broom)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>Activity: ORC is distributing/releasing biocontrol agents which limit pest vigour.</li> <li>Outcome: Some stakeholders noted that objectives in the original GABFAs have been effective, with infestations being progressively contained. They noted that the long-term goal of eradication remains viable with continued year-on-year follow up due to the long seed life of gorse and broom, however, comparison to the aerial survey presented in Figure 19 limits the validity of this statement. It is evident that existing gorse and broom free areas are infested with gorse and broom. The good neighbour rule ensures that neighbouring rural landowners take responsibility for control, which has been beneficial in some cases, particularly for gorse management.</li> <li>Input, activity: ORC is responding to improve gorse and broom monitoring with the developed monitoring plan (BioLink Consulting, 2024a) and is considering alternative methods such as remote sensing.</li> </ul>	<ul style="list-style-type: none"> <li>Input, activity: There are notable challenges in new extension areas. Stakeholders stated that newly designated GABFAs have not been as effective due to higher infestation densities and limited available funding. A re-evaluation of these areas may be necessary to ensure they remain achievable. Stakeholders also raised that requiring landowners to undertake extensive gorse and broom control in new areas may not be fair or reasonable under the Biosecurity Act, given the scale of infestations.</li> <li>Input: There is limited funding for new incursions. Legacy pests such as gorse and broom have a high likelihood of reinfestation, but budget constraints limit resources for addressing new infestations where cost-effectiveness is highest.</li> <li>Outcome: Compliance is a key issue. Gorse and broom have the good neighbour rule and requirement of landowners to act. The public are key to meeting the pest objective, however, current approaches by ORC do not achieve sufficient compliance. This is especially critical for GABFAs.</li> </ul>

### Effectiveness of the RPMP

Combining the different inputs, we conclude that the current approach of ORC is **not effective** in meeting the pest objective for gorse and broom. This is driven firstly by the strong lack of compliance, and secondly the evidence of high re-infestation levels of gorse and broom in existing free areas.

### Suggestion to improve RPMP effectiveness

- Input and activity: Compliance enforcement needs to improve, especially in new GABFAs. The good neighbour rule and requirement to act are not sufficiently enforced by ORC.
- Activity: Where compliance is not enacted, ORC needs to take control of action and charge the non-compliant landowner for service delivery.
- Activity: A challenge to control gorse and broom is its long seed life (20-30 years). Even if removed, the risk of re-infestation remains if seeds remain in the soil. Sustaining ongoing monitoring is important. Aerial surveys can be an efficient approach to monitor large areas. We suggest ORC consider further aerial surveys of gorse and broom free areas for surveillance and effective targeting of enforcement efforts.
- Activity: Re-emergence of gorse and broom in existing GAFBAs is a concern. This can imply that follow-up actions are not undertaken to sustain the initial investments made to remove gorse and broom.
- Input and activity: Improved communication with and encouragement of landowners who have successfully removed gorse and broom to implement regular follow-up cutting and mowing of these areas could be a viable approach to reducing the reinfestation risk.

This practice can ensure that any new plants are removed before they can produce seeds, preventing further reproduction.

By maintaining established gorse and broom-free zones through consistent management, landowners can help to contain and ultimately eradicate these invasive species from their properties and sustain the gains from investment into initial removal of gorse and broom from their sites.

### Feral rabbits

The pest objective of the RPMP is to ensure continuing control of feral rabbits to manage their spread.

**Assessment findings:** ORC is **partially effective** in meeting the RPMP pest objective.

#### Data assessment

Figure 20 shows the number of feral rabbits observed between 2016/17 and 2023/24 from iNaturalist data. While initially declining until 2021/22, since the inception of the RPMP in 2019/20, observed feral rabbit numbers increased in 2022/23 and 2023/24 compared to the 2019/20 baseline (by about 15 observations or 30 percentage points). These observed numbers need to be interpreted with caution.

Looking at locations from iNaturalist data, it is apparent that localised increases in reported sightings, especially around Lake Wanaka, Lake Hawea, and in and around Queenstown (e.g. Lower Shotover, Frankton) are driving the increase in numbers in 2022/23 and 2023/24.

A possible explanation for the recent uptick of reported rabbit sightings could be the external COVID-19 shock on inspections. Rabbit inspections were limited in 2019/20 and 2020/21 due to lockdown regulations. This could have had noticeable delayed impacts on rabbit populations.

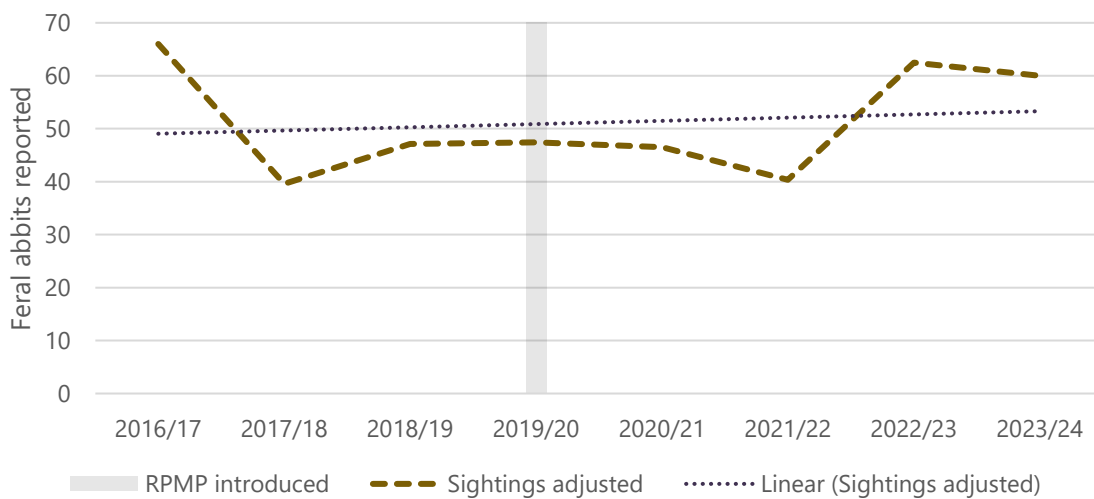
Looking at ORC data on monitoring activities and inspections, the area around Gibbston has clusters of ORC monitoring activities and inspections from the inception of the RPMP in 2019/2020 up to the

most recent data. Stakeholder feedback highlighted success of activities around Gibbston, which could be linked to ORC RPMP activities.

However, the increase in other areas around Queenstown and Wanaka suggests that in these localised areas rabbit numbers are not sustained. A potential explanation can be found in the compliance data (see Figure 21 and below explanation).

The overall trend across time (from 2016/17 until present) suggests a very small average increase of about two observations annually, however the slope is small and can be interpreted as relatively steady.

Figure 20: Feral rabbit observations

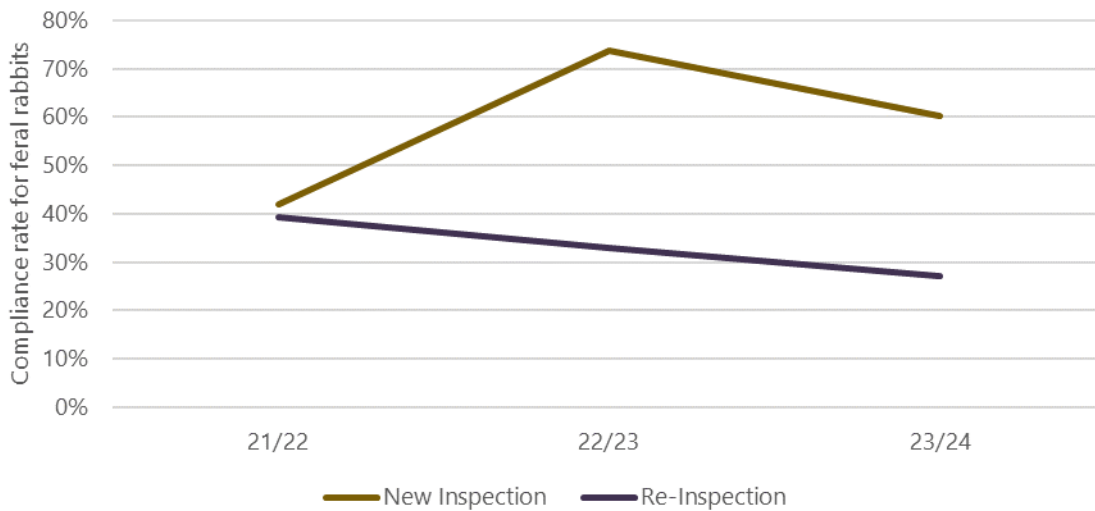


Source: Sapere calculations using iNaturalist data

Figure 21 shows the public compliance rates following from ORC inspections for feral rabbits. Figure 21 shows the public compliance rates following ORC inspections for feral rabbits. Compliance rates for new inspections appear to show an increasing trend, i.e. compliance is improving over time (about 42 per cent in 2021/22 to 60 per cent in 2023/24). Re-inspection compliance has decreased over the three-year period from 40 per cent in 2021/22 to about 30 per cent in 2023/24. It is important to note that, while re-inspection compliance has fallen, re-inspection still led to improvements in reducing pest prevalence.

Comparing rabbit prevalence data from initially non-compliant properties between November 2022 and September 2024 shows the median rabbit prevalence reduces from MMS 5 at the first inspection to MMS 4 at re-inspections. This reduction is statistically significant (Wilcoxon Signed Rank Test, p-value <0.000, n=148). This implies that the undertaking of re-inspections encourages occupiers/landowners to act on rabbit infestations. The change in rabbit prevalence reduces from denser pockets to lighter pockets as they become more distinguishable.

Figure 21: Feral rabbit compliance



Source: Sapere calculations using ORC data

Table 19: Assessment of ORC activities (feral rabbits)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>Activity: There is positive feedback from stakeholders regarding community approach and education in areas like Gibbston, Moeraki, and Lake Hayes, where community events helped improve awareness and education about rabbit control. In those areas, ORC’s educational approach and bringing landowners together have been successful in encouraging action and responsibility. In Moeraki, a coordinated approach with landowners, ORC, and the district council led to reasonable success.</li> <li>Activity: Stakeholders further state that ORC’s clear focus on landowner responsibilities and joint ownership in rabbit control has led to increased engagement from landowners who were previously passive.</li> <li>Activity: Collaborative efforts with other stakeholders, such as the rail control work, have worked well due to the coordination and support from ORC in linking landowners and community members.</li> <li>Outcome: Re-inspections have a positive impact by decreasing pest prevalence.</li> <li>Outcome: In certain areas like Gibbston and Moeraki, rabbit control has seen positive results,</li> </ul>	<ul style="list-style-type: none"> <li>Activity: Stakeholders noted that the current approach has been reactive rather than proactive, with too few staff on the ground to adequately monitor rabbit populations at the scale required. We note that ORC has made significant investments and significantly increased biosecurity inspections over the course of the RPMP.</li> <li>Outcome: Challenges with small landowners and lifestyle blocks. While, according to stakeholders, larger landowners are generally doing well in rabbit control, small landowners and lifestyle blocks often do not take enough responsibility, making it harder to achieve widespread control. This is a critical gap in the current approach, as these landowners are not adequately engaged or incentivised.</li> <li>Input and activity: Ineffective enforcement—a disconnect exists between the overall goal of pest control and individual landowner actions. Enforcement is often seen as lacking, and there are concerns that this results in non-compliance. The lack of strong enforcement, especially in areas where compliance is most lacking, reduces the overall effectiveness of the pest management plan.</li> </ul>

Effective aspects	Less effective aspects
<p>with rabbit numbers reduced, although not to the desired scale. This suggests that focused, area-specific efforts can be successful.</p>	<ul style="list-style-type: none"> <li>Input, activity: Shift in ORC's Service Delivery: Stakeholders noted that a shift away from ORC's direct involvement in service delivery (rabbit control) to a compliance-only role has caused a decline in pest management effectiveness. This has left a gap in service provision, as landowners may not fully understand their responsibilities, or compliance is not strongly enforced. We note that the RPMP requires landowners to act. ORC is not responsible for the service delivery.</li> </ul>

### Effectiveness of the RPMP

- We conclude that ORC is **partially effective** in meeting the RPMP objectives for feral rabbits—partially effective, as some clear successes have been achieved by ORC, for example in Gibbston and Moeraki. On the other hand, significant challenges in containing rabbits in other hot spots remain (e.g. areas around Etrick, Lake Hayes and surrounds). While there are clear concerns about the lack of compliance and associated enforcement, there is evidence that inspections can be effective in reducing prevalence.

### Suggestions to improve RPMP effectiveness

- Activity: Identify areas with the most significant compliance issues, especially around Etrick, Lake Hayes and surrounds, where rabbit populations remain high. Implement strong enforcement and ensure that landowners are held accountable for their responsibilities.
- Activity: Prioritise enforcement based on historical data of compliance and hotspot areas where the problem persists.
- Activity: Continue and strengthen encouragement of landowners to collaborate, share information, and collectively take responsibility for controlling rabbit populations across properties by collaborating with rabbit community groups.
- Activity: Increase targeted communication with small landowners and lifestyle blocks, as they have been identified as a key challenge for control efforts. This could include education campaigns, or penalties for non-compliance.
- Activity: Build on the successful collaboration seen in areas like Moeraki by expanding coordination efforts with adjacent councils and stakeholders in high-risk areas (e.g. cluster areas). This could involve joint rabbit control initiatives, shared resources, and coordination between neighbouring landowners.
- Input and activities: Prioritise areas where the pest problem is still growing or where control is not as effective, such as urban areas and lifestyle blocks.
- Input: Consider creating specific guidelines and resources for small landowners to help them understand their responsibilities and how they can contribute to pest control efforts.

### **Learnings from a community-led rabbit management programme**

In 2021, ORC surveyed a coastal area for rabbit density, issuing non-compliance notices to approximately 50 landowners with properties totalling over 9.4 hectares. ORC organised public events to educate the community on rabbit infestations and management approaches. Following this, the community expanded the management area beyond the initially identified zone to cover 5,144 hectares, aiming to minimise reinfestation risks. This included participation from landowners who had not received compliance notices.

The community engaged experienced rabbit managers, hunters, and the regional council to develop a coordinated management plan. Key actions included:

- conducting a professional night shoot to assess baseline rabbit infestation levels, which had previously been undocumented
- encouraging shared assessments and collaboration among landowners
- hiring a professional contractor for cost-effective control, with costs shared based on property size
- transitioning from shooting to poisoning due to high rabbit densities.

The programme achieved intermediate success where landowners complied. However, challenges included low participation from farmers and lifestyle block owners, fragmented land ownership, and the community's lack of enforcement authority. These factors created a risk of recurring rabbit infestations despite collective efforts.

### **What worked well**

- **Awareness:** ORC identified rabbit infestations and raised awareness, addressing gaps in community knowledge about the issue, regulatory requirements, and assessment scales.
- **Community engagement:** hosting information meetings facilitated collaboration and helped initiate coordinated planning.
- **Coordinated efforts:** success was observed when multiple properties worked together on pest control strategies.

### **Areas for improvement**

- **Greater regional council involvement:** more structured oversight and enforcement could enhance long-term success, reducing reliance on volunteers and ensuring consistent, cost-effective solutions.
- **Stronger enforcement measures:** addressing selective non-compliance would help prevent reinfestation and improve intervention outcomes.

## Nodding thistle

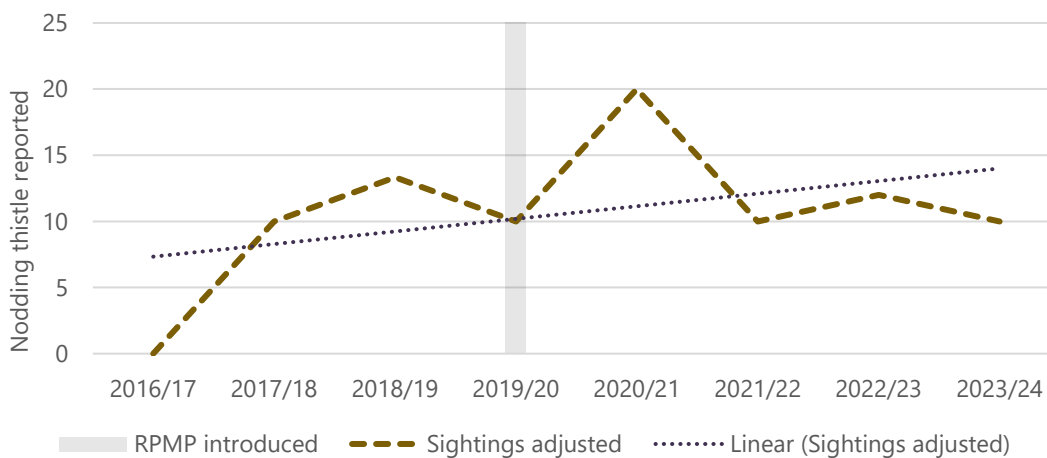
The objective is to implement sustained control of nodding thistle rural-zoned land within specified distances of property boundaries throughout the Otago region to prevent spread.

**Assessment findings:** ORC’s effectiveness in meeting the objectives of the RPMP is **inconclusive**.

### Data assessment

Nodding thistle’s observations between 2016/17 and 2023/24 are shown in Figure 22. An increasing trend over time is visible. While observations increased from the inception of the RPMP, they have fallen in more recent years to levels comparable to the inception year of the RPMP in 2019/20.

Figure 22: Nodding thistle observations



Source: Sapere calculations using iNaturalist data

There were three inspections of nodding thistle in 2021/22—one property was found to be compliant. There were no re-inspections. As nodding thistle is a good neighbour rule pest, inspections depend on reporting from the public, i.e. instigated from a complaint by a neighbour under the good neighbour rule.

### Effectiveness of the RPMP

- Activity: ORC is distributing/releasing biocontrol agents which limit pest vigour.
- We have limited information on nodding thistle. Limited information can arise because nodding thistle is a good neighbour rule pest. There was no stakeholder comment on nodding thistle. ORC did not carry out re-inspection (out of a possible two) in 2021/22. The data is too limited to draw confident conclusions about overall effectiveness. Thus, the assessment of effectiveness is **inconclusive**.

### Suggestion to improve RPMP effectiveness

- Activity: Limited information could point to limited awareness. ORC could consider increasing awareness of the pest among the public.

- ORC should undertake increased monitoring and follow-up through re-inspections of non-compliant properties, and initiate enforcement action (i.e. default work and cost recovery) where repeated non-compliance is identified.

## Ragwort

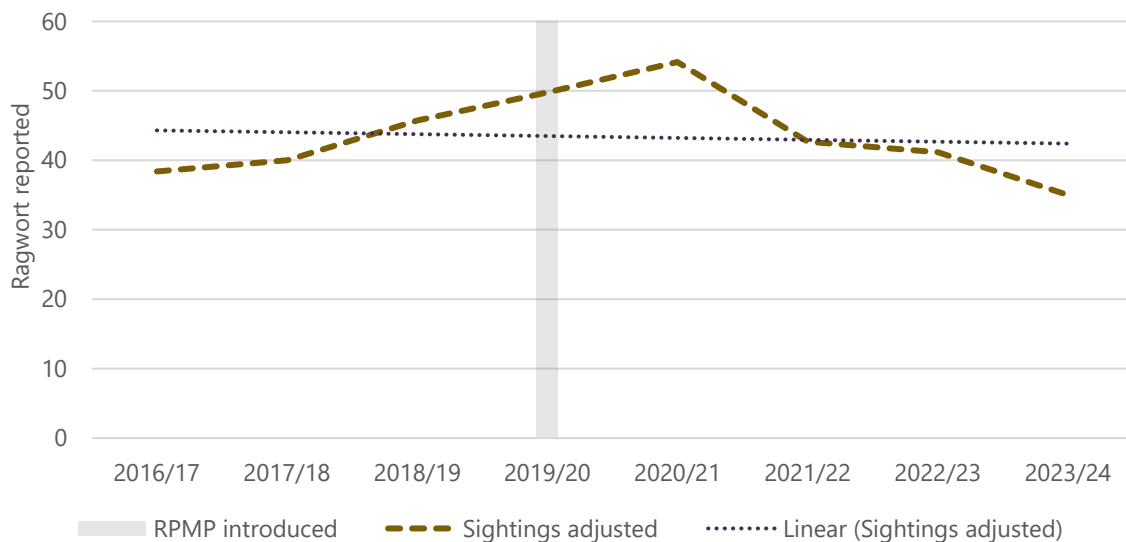
The RPMP pest objective is to implement sustained control on rural zoned land within specified distances of property boundaries throughout the Otago region to prevent spread.

**Assessment finding:** ORC is effectiveness in meeting the objectives of the RPMP is **inconclusive**.

### Data assessment

Figure 23 shows ragwort observations between 2016/27 and 2023/24. Since 2020/21 sightings decreased, reflected also by the overall time-trend. This can suggest that sustained control of ragwort is achieved.

Figure 23: Ragwort observations



Source: Sapere calculations using iNaturalist data

There were four properties inspected for ragwort in 2021/22, all of which were found to be non-compliant. Two were re-inspected—one of these was compliant. As ragwort is a good neighbour rule pest, inspections depend on both reporting from the public, i.e. instigated from a complaint by a neighbour under the good neighbour rule.

### Effectiveness of the RPMP

- Activity: ORC is distributing/releasing biocontrol agents which limit pest vigour.
- We did not receive stakeholder comments on ragwort and have very limited information to judge if ORC is effective in meeting the RPMP pest objective. Limited information can arise because ragwort is a good neighbour rule pest. There was no stakeholder comment on ragwort. ORC carried out two re-inspections out of a possible four in 2021/22; however, the

data is too limited to draw confident conclusions about overall effectiveness. Thus, the assessment of effectiveness is **inconclusive**.

The presented data points to a decrease in recent years, but compliance information shows that compliance is not achieved and only half of non-compliant properties were re-inspected, although compliance data is limited to very few data points. Due to the limited information, the effectiveness of the RPMP is **inconclusive**.

#### **Suggestion to improve RPMP effectiveness**

- Activity: Limited information could point to limited awareness. ORC could consider increasing awareness of the pest among the public.
- Activity: ORC should undertake increased monitoring and follow-up through re-inspections of non-compliant properties, and initiate enforcement action (i.e. default work and cost recovery) where repeated non-compliance is identified.

### **Russell lupin**

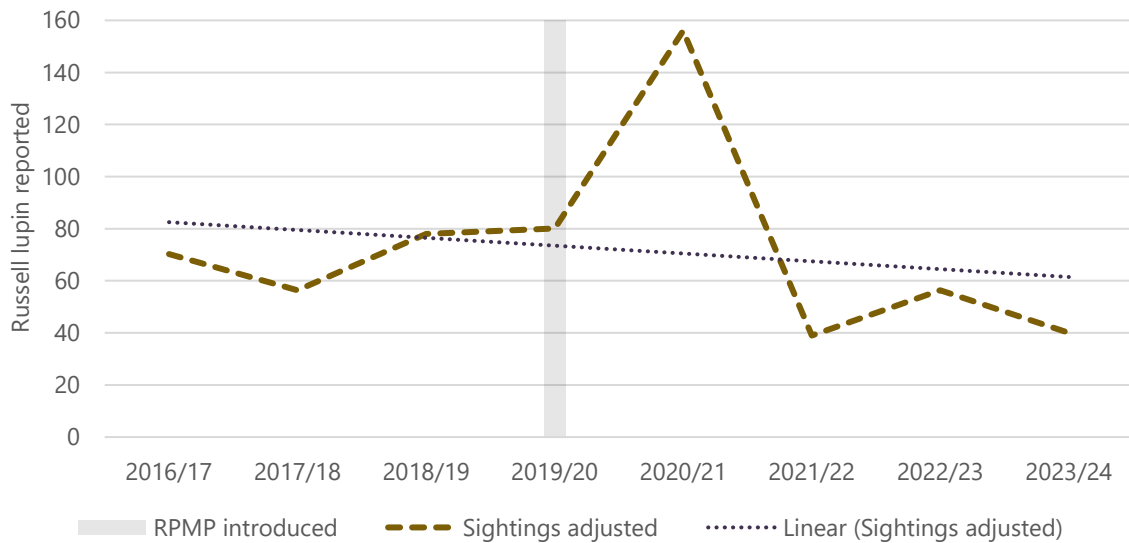
The RPMP pest objective is to instigate boundary controls of Russell lupin to prevent the spread (e.g. the planting and subsequent seeding) of wild lupin plants.

**Assessment finding:** ORC is **not effective** in meeting the pest objective.

#### **Data assessment**

Russell lupin reporting between 2016/17 and 2023/24 are shown in Figure 24. Reporting of Russell lupin in the past three financial years are below the level of reporting at the inception of the RPMP. There is a notable spike in reporting in 2020/21. We note that the reporting of Russell lupin is consistently (across years) driven by observations around Queenstown (e.g. Arthur's Point, Arrowtown, Cardrona, Cromwell, Frankton, Glenorchy, or Lower Shotover River). Some of these are known high-risk areas which ORC regularly monitors. The caveat in using iNaturalist data is that only visible and accessible sites of plants are reported. It is understood that Russell lupin is present as numerous seed-bearing plants in high catchment areas which are more difficult to access. This presence significantly contributes to its spread. Russell lupin beds have been found in headwater rivers (e.g. Dart and Rees Rivers), that provide a seed source for areas further down the catchment (e.g. Glenorchy).

Figure 24: Russell lupin observations



Source: Sapere calculations using iNaturalist data

We have no information about compliance inspections and associated outcomes for Russell lupin.

Table 20: Assessment of ORC activities (Russell lupin)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>Output: Our data suggests that surveillance of Russell lupin is achieved at known hot spots around Queenstown.</li> <li>Activity: ORC conducted aerial surveillance to collect baseline infestation for five of the six at-risk catchments detailed in the RPMP (Dart, Rees, Matukituki, Makarora, Hunter).</li> <li>Activity: ORC finalised and implemented a Russell lupin strategy in 2023, to support pest monitoring and surveillance.</li> </ul>	<ul style="list-style-type: none"> <li>Outcome: There is no evidence of control actions undertaken from ORC. We note that while ORC provides the service delivery for Russell lupin, control is optional under the RPMP.</li> <li>Input, activity, output, outcome: Presence of numerous seed-bearing plants in high catchment areas. Russell lupin is found to be spreading down the catchments. Effective control of wild Russell lupin requires targeted action in the upper river areas, and collaboration with DOC.</li> <li>Outcome: One stakeholder noted that Russell lupin is spreading in north Otago, becoming well established in that area. This suggests that Russell lupin is present beyond highlands of Otago.</li> </ul>

### Effectiveness of the RPMP

- ORC’s current approach to managing Russell lupin is **not effective**, as the pest continues to spread and is not being sustainably controlled. While surveillance is in place, ORC is not undertaking any control measures to prevent further spread. Although such action is optional

under the current RPMP, control inaction undermines the effectiveness of achieving the pest management objective.

### **Suggestions to improve effectiveness of the RPMP**

- Input and activity: ORC have successfully driven surveillance in high-risk areas around Queenstown. Building on this approach, we recommend forming a taskforce with DOC and other local community weeding programmes to plan control measures in upper catchment areas. Ideally, a control strategy would result from this activity.

### **5.3.6 Site-led programmes**

There are four site-led programmes: Otago Peninsula, West Harbour – Mt Cargill, Quarantine and Goat Islands, and lagarosiphon in Otago's rivers and lakes. For the first three sites, the objectives of the RPMP are to support community groups and other agencies to protect ecological integrity. For lagarosiphon, the objective is to support LINZ in controlling and eradicating lagarosiphon.

#### **Assessment findings:**

- Lagarosiphon: ORC is **partially effective** in meeting the RPMP pest objective.
- Otago Peninsula: ORC is **partially effective** in meeting the RPMP pest objective.
- West Harbour – Mt Cargill: ORC is **partially effective** in meeting the RPMP pest objective.
- Quarantine and Goat Islands: There is insufficient information. As such the effectiveness of ORC in meeting the RPMP pest objective is **inconclusive**.

ORC provide direct funding to the site-led programmes to achieve RPMP pest objectives in these areas. Among the pests listed for site-led programmes, only lagarosiphon was subject to compliance inspections. We note that there are no rules for plant aspects of site-led programmes. Of the 21 inspections in 2021/22, 20 (95 per cent) were compliant. In the same year, there were seven re-inspections. Five (71 per cent) were found to be non-compliant. We do not have sufficient data to assess progress at site-led programmes. However, the case studies below provide insights from three stakeholders who are actively involved in running site-led programmes that are funded by ORC in the Otago region.

These initiatives, operating in both urban and rural landscapes, focus on predator and weed control to protect native ecosystems. Each group employs a unique approach while facing shared challenges in governance, funding, and enforcement. The initiatives demonstrate the power of community-driven conservation but also highlight systemic barriers to their effectiveness. Strengthening strategic support, improving general funding stability, and enhancing public engagement is perceived as important by stakeholders to sustain long-term biodiversity gains under the RPMP site-led approach. A challenge frequently highlighted by stakeholders is the lack of collaboration among some private landowners in relation to their pest control efforts. This presents a limitation of the RPMP, as there are no specific rules for site-led pests, meaning the ORC is unable to take enforcement action. It is important to note, however, that this does not undermine the effectiveness of the ORC in supporting site-led programmes.

## Learnings from three site-led initiatives in Otago

### Initiative 1: Weed management

This initiative focuses on the control of highly invasive plant species threatening native bush areas. Utilising advanced technology, such as drone-assisted aerial mapping, volunteers track and contain the spread of pest plants. The work is largely carried out by volunteers who invest personal resources into weed removal.

#### What worked well

- **Collaborative efforts:** strong partnerships with other conservation groups helped expand the reach and effectiveness of weed control measures. Volunteer facilitation programmes have been instrumental in harnessing community enthusiasm and involvement in weed management efforts.
- **Site-led programme benefits:** the site-led programme has provided some benefits, particularly by including six key pest plants, which has helped to secure funding and encourage landowner participation in weed management. New funding streams, such as the ECO-fund, have also provided support for some site-led initiatives, helping volunteer groups to access the resources they need.

#### Areas for improvement

- **Sustainable longer term funding support:** although initial funding supported stakeholders in site-led programs to carry out key activities, achieving long-term pest control targets requires sustained investment. Funding challenges impede progress, as site-led initiatives often depend on inconsistent, one-off annual grants, making long-term planning difficult. Consideration to provide longer-term funding for initially successfully run site-led programmes initiatives with significant positive impacts on RPMP objectives could be considered. Longer-term funding would enable such initiatives planning activities at scale.
- **Public awareness deficit:** while ORC has existing campaigns, such as information pieces celebrating pest control efforts made by local community groups or their pest of the month campaign which includes site-led pests, many landowners remain still unaware of their role in invasive species management. This highlights the need to enhance educational outreach. ORC could increase the support of local community groups in raising awareness of site-led pests, with for example a postal messaging campaign and leaflets in targeted areas; and highlighting success stories of local initiatives in managing pests in site-led areas.

## **Initiative 2: Possum control**

This initiative primarily targets possum eradication, with long-term plans to address mustelids and rodents. Covering a vast 63,000-hectare area, it integrates GPS mapping and ground surveys to track and mitigate pest activity. Collaboration with stakeholders and local communities has been central to its success.

### **What worked well**

- **Volunteer dedication:** the initiative relies on a network of community groups and volunteers, who are passionate and dedicated to pest control beyond the boundaries of the RPMP. They have achieved significant success in reducing possum numbers, especially on the Otago Peninsula where there are now fewer than 20 possums after years of targeted effort. A successful knockdown operation in a previously untreated area – outside the scope of a site-led plan – resulted in a reduction of the residual trap catch index from 54 to 26 per cent within five months.
- **Community buy-in:** community support for this initiative was strong, with landowner surveys demonstrating a 100 per cent willingness to contribute financially to continuation of the possum control work. Non-governmental organisations (NGOs) are perceived as impartial, cost-effective, and motivated, which can make them more trusted and effective than council initiatives, especially among farmers and rural communities.
- **Sustainable long-term funding:** ORC provided significant direct funding to support the initiative over a period of 5 years.

### **Areas for improvement**

- **Strategically leverage and empower NGOs:** NGOs have dedicated and passionate volunteers, and trust and buy-in from the community. The council is perceived by some as lacking in support, community engagement, and resource provision, while distrust among rural landowners poses additional barriers. ORC could strategically leverage the involvement of NGOs to maximise impact. Expanding funding and resources for NGOs would enable more coordinated and strategic implementation of predator control initiatives and sustain existing investments in the long-term
- **Greater community engagement and education:** a stronger emphasis on educational initiatives could enhance public participation in pest management. ORC could play a more active role in educating landowners and providing practical resources to support pest control.

### **Initiative 3: Holistic biodiversity restoration project**

This project adopts a comprehensive approach to biodiversity restoration, integrating predator and weed control with indigenous environmental knowledge. It works in partnership with conservation organisations, mana whenua, and regional authorities to achieve long-term ecological sustainability. A key success has been the near eradication of possums from the Otago Peninsula, with over 25,000 removed. Monitoring suggests fewer than 20 remain, with no recorded sightings in the past eight to nine months, demonstrating the effectiveness of control measures.

#### **What worked well**

- **RPMP has enabled collaboration and funding:** the RPMP has played a crucial role in fostering collaboration and securing funding for pest control initiatives, enabling groups to pool resources and work together more effectively. The site-led approach introduced by the RPMP has allowed for a more coordinated and strategic response, strengthening partnerships between mana whenua, community groups, and the regional council.
- **Successfully incorporated Mātauranga Māori:** establishing RPMP enabled identification of areas of significant interest from kaitiaki perspective, with mana whenua being involved from the outset in identifying key ecological areas of historical and cultural significance. There are good relationships between ORC and mana whenua.

#### **Areas for improvement**

- **Clarify language and enforceability:** one of the most significant issues is the difficulty in enforcing pest control on private land. The current wording of the RPMP, particularly regarding "harbouring" pest species, has been too ambiguous, making it difficult to ensure compliance. A suggested improvement is to redefine the term to "pest species present," which would provide greater clarity and enforcement capability. Looking ahead, a future iteration of the RPMP could be enhanced by introducing legislative support within site-led programmes for pest control on private land and further integrating a values-based model for decision-making.
- **Improve community awareness of the RPMP, and leverage community organisations:** greater engagement could help strengthen conservation efforts across the region. While public awareness of the RPMP itself remains limited, many community members trust community organisations to act on their behalf, reinforcing the importance of strong community-driven conservation efforts.

Table 21: Assessment of ORC activities (site-led programmes)

Effective aspects	Less effective aspects
<ul style="list-style-type: none"> <li>• Input: ORC initiated a funding bid process and allocated funding to site-led initiatives.</li> <li>• Activity: For some site-led programmes, ORC successfully brought together different stakeholders and community groups and coordinated efforts of activities. This was perceived as a success by stakeholders.</li> <li>• Activity: For lagarosiphon, ORC took the lead and delivered the programme in Wanaka and Wakatipu, with notable success. Key factors of success are that ORC managed to gain local buy-in and sustained support for controlling the pest, and that it provides a coordinated approach and funding.</li> <li>• Activity: For lagarosiphon, ORC scaled up their efforts in management. A recent report (Otago Regional Council, 2023a) shows that ORC conducted frequent outreach meetings with LINZ and other stakeholders (13 in FY2023/24), engaged with other programmes (Check, Clean, Dry programme: 767 times in FY2023/24), as well as carried out more than twice the inspections for lagarosiphon monitoring for priority water bodies (33 of 18 planned in FY2023/24) and more inspections for secondary water bodies (50, planned target for FY2023/24 was 40).</li> </ul>	<ul style="list-style-type: none"> <li>• Input: Stakeholders raised concerns over the lack of ORC longer-term funding certainty for their site-led programme activities, threatening the sustainability of their pest management efforts.</li> <li>• Activity: A frequently raised concern among stakeholders is compliance and enforcement. Community groups that have made significant investments in pest control often see their efforts undermined by private landowners who do not engage, allowing pests to persist and spread from their properties. While we acknowledge this concern, we note that under the current RPMP, site-led programme rules apply to lagarosiphon and wallabies, and following recent legal advice ORC received, also to possums.</li> <li>• Activity: Lagarosiphon control in Lake Dunstan poses a challenge, and a stakeholder raised concerns of limited effectiveness of lagarosiphon control.</li> <li>• Further, ORC noted in a recent report the presence of lagarosiphon in priority water bodies (Bullock Creek and Albert Town) and in secondary water bodies in the Purerua River, and Inch Clutha (Otago Regional Council, 2023a). On the latter point, this may not necessarily be a negative outcome, as increased inspections and monitoring can reveal greater extent of the problem than previously assumed.</li> </ul>

### Effectiveness of the RPMP

- Quarantine and Goat Islands: We are not able to assess the effectiveness for these, as such, effectiveness is **inconclusive**.
- Otago Peninsula and West Harbour – Mt Cargill: The case studies and information from stakeholder interviews signal **partial effectiveness** of ORC’s activities in meeting the RPMP objectives for these site-led programmes.
- Lagarosiphon: ORC has clearly been effective in meeting the RPMP objective for several sites in Otago. The Check Clean Dry programme has a part in this success as it provides good advocacy and education around lagarosiphon and freshwater pests in general. However, the presence of lagarosiphon in Lake Dunstan, for example, signals that ORC is **partially effective**.

**Suggestions to improve RPMP effectiveness**

- Activity: For lagarosiphon, increase funding for LINZ around Lake Dunstan. Build on success stories from Lake Wanaka and Wakatipu in leveraging community support and local buy-in.
- Input: For other site-led programmes, build on successful initiatives. Consider targeting follow-up funding for such initiatives, providing these initiatives with long-term planning and scaling activities.
- Activity: Organise quarterly meetings which engage local site-led community groups to foster collaboration and share reciprocal learnings.

## 6. Programme assessment and recommendations

We present in this chapter an assessment of the RPMP at the programme level and resulting recommendations. Recommendations are tailored to:

1. Enhance the status quo of the RPMP.
2. Support ORC in developing the next RPMP.

### 6.1 Summary of key findings

#### Recommendations for priority areas

ORC can enhance the status quo by implementing our recommendations, in order of priority:

1. Raising public awareness of the RPMP in Otago.
2. Prioritise compliance activity to improve public compliance to RPMP rules in Otago.
3. Improve current approach to monitoring and surveillance of RPMP pests

Specific recommendations and suggestions for each are presented in Table 24.

Table 22: Recommendations for priority areas of the current RPMP

Raise public awareness	Improve public compliance	Improve monitoring/surveillance
<ul style="list-style-type: none"> <li>• Simplify the RPMP presentation, accessibility and reach.</li> <li>• Clarify rules and target communication to key audiences.</li> <li>• Improve transparency to and motivation of the public by sharing more success stories.</li> </ul>	<ul style="list-style-type: none"> <li>• Initially, target enforcement efforts where investments and awareness are already in place (i.e. old man’s beard, rabbits, bomarea, wilding pines). Also consider prioritisation of areas with highest biodiversity or economic/cultural value.</li> <li>• Communicate more clearly the consequences of non-compliance following inspections, while also highlighting success stories resulting from enforcement efforts.</li> <li>• Utilise powers under the Act of default work and cost recovery in cases of repeated non-compliance.</li> <li>• Leverage data to optimise enforcement efforts.</li> <li>• Increase the number of new and re-inspections. Consider targeting areas with highest biodiversity or economic/cultural value first. <i>Note:</i></li> </ul>	<ul style="list-style-type: none"> <li>• Fill data gaps by leveraging citizen science and integrating stakeholder data.</li> <li>• Incentivise the public to contribute data where gaps are present.</li> <li>• Consider introducing outcome-based monitoring.</li> <li>• Invest in capacity and capability by utilising tools such as AI-enabled traps, drones, and remote sensing; additionally, provide training for biosecurity staff.</li> <li>• Prioritise efforts where data gaps are most significant, focusing first on areas with the highest biodiversity or economic/cultural value.</li> </ul>

Raise public awareness	Improve public compliance	Improve monitoring/surveillance
	<p><i>this should be accompanied by appropriate enforcement activities (i.e. default work and cost recovery) as inspections alone will have limited impact without follow-through.</i></p>	

## 6.2 Effectiveness at the programme level

Our programme-level assessments focus on common overlapping themes that emerged during our analysis and stakeholder engagement. These themes are presented in Table 23 below. From there, we outline key areas ORC should consider actioning as soon as possible (raising awareness, public compliance, and monitoring and surveillance).

Table 23: Effective and non-effective ORC RPMP efforts

	Effective aspects	Less effective aspects
Inputs	<p><b>Investment in technology:</b> the use of tools such as GIS mapping and the improved data collection system (Survey123) are significant improvements made by ORC. Improvements in the data system led to more consistent reporting and permitted before-and-after comparison of pest management efforts by landowners/occupiers (see Appendix B for the assessment of ORC data and the positive changes made by ORC to improve data quality and capture).</p> <p><b>Investment in staff:</b> ORC has made investment in their staff, creating additional biosecurity and managerial roles to support the programme.</p> <p><b>Increased total RPMP funding uplift:</b> funding for the RPMP was increased to support the delivery of the programme.</p> <p><b>Targeted funding for specific initiatives:</b> dedicated funding streams for pests, such as rooks, spartina, wilding pines, or on the Otago Peninsula for site-led programmes led to success in pest control.</p>	<p><b>Funding and prioritisation challenges:</b> while funding increases have been made, stakeholders report limited capacity for enforcement, monitoring, and proactive pest management. This suggests the challenge may lie not only in funding levels, but also in how resources are prioritised and allocated.</p> <p><b>Funding use:</b> stakeholders reported an inefficient use of resources by ORC, targeted towards a reactive rather than proactive pest management approach. This limits the effectiveness of resources used. Stakeholders also highlighted challenges in short-term funding for community or site-led projects requiring long-term support to achieve sustainable outcomes.</p> <p><b>Transparency and inclusivity:</b> stakeholders, including iwi, noted insufficient transparency in budget allocation to pest management initiatives of the RPMP (e.g. pest programmes and pests), and a lack of prioritisation for Māori, but also among NGOs.</p> <p><b>Lack of RPMP spending understanding:</b> a challenge in ORC’s current accounting system does not permit specific tracking of RPMP-related expenditures, hampering an appropriate assessment and clear indication of where the</p>

	Effective aspects	Less effective aspects
		<p>money is spent.</p> <p><b>Limited spending on communicating the RPMP:</b> ORC has set aside a limited amount of funding to engage with the public to create awareness. However, creating awareness is a key success factor for RPMP effectiveness.</p>
Activities	<p><b>Education campaigns:</b> public education campaigns, such as those targeting wallabies, pest of the month specifically for rooks, or targeted campaigns in regional areas for rabbits or predator-free initiatives, have improved awareness and encouraged individual action in rural areas.</p> <p><b>Cross-boundary collaboration:</b> partnerships with council groups, like Environment Canterbury, are supporting pest management efforts relevant to controlling cross-boundary pests such as wallabies.</p> <p><b>Oversight:</b> several examples exist where ORC provided oversight and brought together stakeholders, such as on the Otago Peninsula at site-led programmes, demonstrating successful pest management.</p> <p><b>Targeted monitoring:</b> where ORC provided targeted monitoring, success can be achieved, for example relating to spiny broom and rook eradication, or lagarosiphon.</p>	<p><b>Limited communication:</b> the communication budget is limited and the RPMP document is lengthy and hard to read. The lack of communication of the RPMP rules strongly reduces awareness of the plan, and landowner/occupier responsibilities. This is a critical point and causes an inefficiency of the RPMP.</p> <p><b>Monitoring and inspection approach:</b> current inspections have a strong focus on specific pests (i.e. rabbits, bomarea, and old man's beard), which is likely driven by the rules of the RPMP (i.e. good neighbour rules and requirements to act) and by public awareness of pests; both increase the responsibility for ORC for inspections. This binds resources.</p> <p>While we acknowledge ORC's efforts to enhance monitoring, we want to highlight the opportunity to expand monitoring to other pests in high-biodiversity areas. ORC has made significant progress in this regard, particularly with old man's beard, by prioritising high-biodiversity areas for targeted monitoring.</p> <p><b>Re-inspections and new inspections:</b> ORC can improve in conducting re-inspections, which are limited at present. Increasing the number of new (first-time) inspections is also important to ensure timely identification and follow-up of non-compliant properties.</p>
Outputs	<p><b>Localised species control:</b> success stories include rook eradication, and lagarosiphon management in Lake Wanaka and Lake Wakatipu. The latter relates to strong community efforts with oversight from ORC.</p> <p><b>Increased community participation:</b> education-first approaches have led to greater involvement in local initiatives controlling</p>	<p><b>Lack of enforcement:</b> there is low prioritisation of enforcement and thus ORC is not meeting its targets as shown in our analysis. Furthermore, stakeholders noted that the lack of enforcement risks their efforts and time invested in managing pests according to the plan in their local areas.</p> <p><b>Follow-up to non-compliance:</b> there is limited enforcement post non-compliance. While NoDs were issued, at present there have been no</p>

	Effective aspects	Less effective aspects
	possums.	<p>follow through consequences for non-compliance to NoDs.</p> <p><b>More visibility needed:</b> outputs are required to show the public success stories of how funding is used and how the RPMP affects pest management efforts, potentially creating more community buy-in.</p>
Outcomes	<p><b>Targeted successes:</b> targeted inputs, oversight, and clear monitoring led to success in rook eradication efforts, an effective and positive trajectory of spiny broom and spartina control. Where site-led programmes were empowered by funding and by oversight from ORC, success in pest management was achieved, for example in possum eradication on the Otago Peninsula or at West Harbour – Mt Cargill. Furthermore, national funding support is enabling success in developing approaches to enable improved wallaby pest management. These success stories reflect the potential of well-funded, collaborative efforts.</p> <p><b>Enhanced awareness in some areas:</b> specific outreach efforts have led to improved understanding of pests among some rural landowners.</p>	<p><b>Broader systemic issues:</b> systemic issues, like reinfestation of rabbit populations in localised areas around Queenstown and between Queenstown, Luggate and Wanaka, or gorse and broom issues fragmented efforts, and lack of enforcement limits broader progress towards an effective RPMP delivery.</p> <p><b>Limited awareness of and compliance to the RPMP:</b> community groups, urban and lifestyle block landowners remain largely unaware of their responsibilities under the RPMP, which limits compliance but also the buy-in of the community. There is a general unawareness of the RPMP among the public as reported by stakeholders.</p>

### 6.3 Recommendation 1: Raising public awareness of the RPMP

A barrier to more effective pest management outcomes identified by stakeholders is the lack of awareness of the RPMP and the understanding of its rules and listed pests. Making the plan more accessible and user-friendly, alongside targeted communication efforts, could greatly improve stakeholder engagement and compliance, leading to better pest management outcomes.

Raising awareness of the RPMP has the highest priority, as effective communication is critical for engagement and compliance, which both build the foundation for successful pest management in the community. It requires structured outreach efforts but not significant financial investment, i.e. it has potential for being cost-effective with strong multiplier effects on RPMP effectiveness following the programme logic models.

## 6.3.1 Recommendations to improve effectiveness

### Presentation of the RPMP plan and rules

- Stakeholders suggested that sharing a simplified version of the current plan using infographics and plain language could enhance the communication process. One stakeholder noted that a presentation style like Otago's long-term plan consultation would be beneficial.
- We find Greater Wellington's online presentation of the RPMP particularly useful. It is easily accessible, well-structured, and provides a clear overview of pests with a mobile-friendly layout. This format could be considered for updating ORC's online presence regarding the RPMP and for outreach initiatives, such as sharing updates and pest management rules through council emails or postal campaigns targeting specific pests and areas of concern.<sup>10</sup>
- Additionally, Greater Wellington utilises consumer-paid targeting algorithms to raise awareness of the RPMP and the incentive campaign for people browsing the web. This approach could be an effective way to enhance awareness across Otago without relying on additional full-time equivalent (FTE) staff. ORC could consider adopting a similar strategy, though the associated costs for such paid targeting are currently unknown to Sapere.
- Another great example is the communication from the Victorian Conservation Regulator, around its regulatory priorities (Victorian Government, 2024). It is very clear about its priorities, recognising trends and setting them out in a simple and understandable way. It adopts the Braithwaite compliance triangle ("Pyramid of Responsive Regulation").
- Stakeholders frequently highlighted confusion and lack of clarity about the pest plan's rules as a significant issue impeding compliance and effective management. For instance, the Modified McLean Scale for rabbit control was identified as difficult to interpret, particularly in peri-urban contexts. This could be done with visual explanations of what different scores on the scale look like. We further suggest clearer communication of the good neighbour rule for wilding pines due to the noted confusion about the good neighbour rule interpretation by stakeholders.
- A more user-friendly plan, i.e. an edited version of the RPMP, would also include clear, actionable information to help stakeholders understand their obligations, for example through hyperlinks to relevant information sources. Since 51 pests are included, it is easy to get lost in the plan. A simplification could ensure that priority pests, where there is the greatest need for community vigilance and action, appear prominently.

### Sharing success stories

- Additionally, stakeholders expressed a desire for greater transparency and regular updates on pest management activities and successes to foster trust and motivate participation. We note that ORC is already sharing success stories on their website, for example about the first spy wallaby hunt success (Otago Regional Council, 2024c). However, the lack of awareness among

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<sup>10</sup> Greater Wellington RPMP: <https://www.gw.govt.nz/environment/pest-management/pest-plants/>.

stakeholders indicates that effectiveness of stories can be improved. This relates to the stories told and how the stories are shared with the public.

- Sharing success stories and updates to the public was deemed as important as sharing a clear and accessible pest plan. Stakeholders suggested annual updates on the success and progress of the RPMP in Otago as done by the Bay of Plenty in their annual reports (Bay of Plenty Regional Council, 2024) or by Canterbury Regional Council (Canterbury Regional Council, 2024). Both reporting styles clearly highlight targets, outputs and the current trajectory in achieving specific pest objectives.
- Success stories could further be shared in quarterly meetings with local stakeholders by their pest area focus, ensuring sustainable stakeholder buy-in and discussing further learnings to strengthen activities. Localised targeting of success stories via collaborating with local area Facebook groups, for example, could boost awareness and be a cost-effective approach to disseminate information.

### 6.3.2 Pest type focus

#### **Presentation of the RPMP plan and rules**

The communication of the plan should focus on the 51 pests included in the RPMP, to address a general lack of awareness of the RPMP among the public in Otago.

However, communication of rules relating to specific pest issues in localised areas could be further considered once general communication of the plan is achieved, i.e. high presence of bomarea in the Otago Peninsula, lagarosiphon challenges at Lake Dunstan, or rabbit concerns around Southern Lakes. ORC's ArcGIS mapping of pests could be a starting point in targeting priority communication to areas.

#### **Sharing success stories**

We acknowledge that ORC is already sharing success stories, but this can be further strengthened as per stakeholder feedback, as there seems to be limited awareness and/or impact of such stories on the public.

Success stories could focus on site-led programmes requiring strong community-support—also to highlight the efforts made by volunteers. They could further be targeted to local stakeholder groups such as community rabbit programmes where success was achieved, and learning can be shared with other community rabbit programmes.

We note that rate-payer fees were increased to fund the RPMP—accordingly, it would be good for the public who fund the efforts to see what difference their investment has made. Success stories could focus on pests where significant investment has been made over a year. At present, this would include pests such as rabbits (local success in Gibbston or Moeraki), ORCs approach to target and identify wallabies from the Judas wallaby trials as a possible future control approach to eradicate wallabies in Otago, building on the trial story shared in the past,<sup>11</sup> and success stories relating to eradication of

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<sup>11</sup> This is especially important in the context of our report finding that ORC is currently not effective in controlling their spread, but have made important investment with potential to control and eradicate wallabies going forward.

rooks. We further suggest highlighting success stories from site-led programmes such as the control of possums on the Otago Peninsula.

## **6.4 Recommendation 2: Improving public compliance to RPMP rules**

Feedback from stakeholders highlights a need for improvement in ORC's efforts to enforce public compliance to rules. Our analysis of compliance data to RPMP rules (i.e. compliance before and after re-inspections) in the previous chapter supports this point. Stakeholders emphasised the need for more robust enforcement from ORC to ensure sustained pest control and prevent regression in managed areas. Current compliance levels generally fall short of the target set by ORC (e.g. MMS equal or below 3, or a plant infestation grading scale equal to zero), further illustrating the need for stronger oversight.

Early in the RPMP in 2021, ORC identified gaps in its biosecurity enforcement capacity related to RPMP delivery (Otago Regional Council & Andrea Howard, 2021). Since April 2021, ORC has made material investments in its biosecurity team. Staffing increased from 11 FTE, along with at least three half-FTE, to 18 FTE and at least five half-FTE dedicated to biosecurity by October 2024 (Otago Regional Council, 2024b). However, these changes do not reflect the actual effectiveness of the changes in enforcement outcomes.

Enforcement responsibilities are managed by delivery leads in collaboration with a compliance support coordinator (Otago Regional Council & Andrea Howard, 2021). The structural changes introduced a flat organisational model based on geographic areas.

Given this expansion, it is reasonable to conclude that ORC has sufficient resources to focus on enforcement without requiring additional funding. The key consideration is the approach set by ORC, the delivery leads, and coordination efforts.

While ORC attempts to achieve compliance through a scaled approach, as described by Braithwaite's compliance triangle, there are enforcement tools which are available such as NoDs, which ORC have used, albeit with limited impact on compliance, or moving towards direct action and cost recovery (latter two options are to our knowledge not used by ORC). This means there is limited impetus for public compliance to RPMP rules.

Improving public compliance with RPMP rules is a high priority, second only to raising awareness of the RPMP. Public compliance with the rules is essential for the RPMP to achieve its pest objectives. Compliance is built on awareness. The requirement for additional resources to implement the change should be low—as stated above, ORC made significant changes to their biosecurity team size and administrative support between 2021 and 2024. Enforcing compliance requires staff and administrative resources to follow up with non-compliant individuals. However, there will be benefits and cost reductions if compliance improves through a credible enforcement approach. Cost reductions arise from fewer inspections and re-inspections if credible enforcement is in place, meaning the costs of non-compliance are internalised by non-compliant landowners. Additionally, if the public is aware that non-compliance has consequences, greater compliance can be achieved without the need for extensive reporting.

## 6.4.1 Recommendations to improve effectiveness

### Strengthen oversight and compliance

- Target pests where ORC have invested significant time in monitoring and inspections, but public compliance remains low. This relates to old man's beard, rabbits, and bomarea.
- One reason for targeting these pests first is that improved enforcement of compliance would enhance the returns on ORC's monitoring activities. In the long term, this could free up resources currently used for inspections and monitoring of these plant and animal pests, allowing them to be reallocated more effectively. This approach is a key consideration for improving overall effectiveness, ensuring that ORC's actions lead to tangible pest management outcomes.
- We recommend that all non-compliant properties are re-inspected across pest species, which is currently not achieved. This is essential before issuing non-compliance notices and enforcement. In addition, increasing the number of first-time inspections is essential to identify new non-compliant properties requiring follow-up.
- Take enforcement action by implementing the formal enforcement rules within the current enforcement policy (i.e. default work and cost recovery). A potential strategy could involve adopting a local council's successful approach, where initial notice letters are sent alongside information on how to remove the pest. If the pest is not removed within three months, the council would proceed with the necessary actions (i.e. default work) and invoice the responsible party.
- Improve communication between community groups where significant pest management efforts have been made, but the lack of compliance of some actors impedes long-term sustainability of pest outcomes. This was evident in Moeraki, which several stakeholders highlighted as a success story for rabbit control. However, a small number of landowners did not comply with the measures implemented by the community group. Feedback indicated that these non-compliant properties are harbouring remaining rabbit populations, posing a threat to sustainable long-term outcomes.
- We recommend ORC make better use of existing data. ORC collects valuable information on compliance and non-compliance; however this data is not being effectively utilised if it does not inform enforcement decisions. Leveraging this data to drive and target enforcement efforts would enhance the effectiveness of compliance activities and the purpose of collecting the data.
- We recommend ORC make better use of existing biosecurity FTE. ORC have made significant investments in biosecurity. There is merit in switching to a stronger enforcement approach—we recommend that delivery leads and coordinators develop a consistent enforcement strategy based on our recommendations.

### **Foster stakeholder assurance**

- ORC should focus on the communication of enhanced enforcement efforts to stakeholders to build trust and encourage broader compliance. This could, for example, be part of the annual biosecurity report and/or quarterly meetings with stakeholders and shared success stories.
- Highlight the long-term benefits of enacting ORC's compliance and enforcement policy for achieving regional pest management goals. This could be integrated in our suggested improved RPMP communication process.

### **6.4.2 Pest type focus**

There is no specific pest focus, as compliance is a systematic challenge rather than a pest-specific challenge. However, in a first effort to target resources, enforcing compliance could focus on known pests where ORC is reasonably assured of the awareness of the public, and ORC holds data on compliance—i.e. legacy pests such as bomarea, rabbits or old man's beard, or on localised pest issues. This would partially keep with ORC's education first approach.

Further consideration could be given to prioritising areas with the highest biodiversity, economic, or cultural value, and focusing on specific pest issues in that area. This approach may offer the greatest return on investment. Once the communication of the pest plan has improved, a more general approach should be adopted.

## **6.5 Recommendation 3: Improve monitoring and surveillance of RPMP pests**

Effective management of RPMP pests hinges on accurate monitoring and surveillance. Stakeholders and ORC staff have identified limitations (see below) in current pest monitoring practices, which hinder the ability to assess and track pest prevalence across Otago. This limits the effectiveness of pest management efforts.

Accurate and consistent data collection is important for identifying trends, targeting interventions, and measuring success. Strengthened monitoring efforts would have the potential to fill existing data gaps and support proactive pest management strategies, with the potential to reduce long-term costs and impacts of pests.

To date, ORC has undertaken limited surveillance activities, a concern raised by both ORC and stakeholders. Existing successful efforts have primarily focused on aerial surveillance for gorse and broom, as well as targeted surveillance of Russell lupin in selected areas around Queenstown district.

In response to these gaps, ORC has initiated more strategic planning with the development of its Monitoring and Surveillance Action Plans 2024-2025 (2024b). These plans prioritise the surveillance and monitoring of key pests, including rooks, spiny broom, African love grass, Nassella tussock, spartina, and gorse and broom.

Despite these positive steps, ORC has acknowledged capacity and capability limitations within its biosecurity team, particularly concerning the execution of surveillance activities. As we noted above (section 6.4), ORC have made material investments by nearly doubling the FTE involved in biosecurity

activities between April 2021 and October 2024. There is thus reason to consider that previously, resources are not most effectively used to target surveillance and monitoring. An attempt to rectify this through increased resourcing the introduction of two biosecurity specialist roles which hold expertise, and they have capacity to lead surveillance activities. For the first time, budget has been allocated for surveillance activities generally through the LTP 2024-2034. This will also support enabling this activity to occur.

Monitoring and surveillance are ranked as the third priority, following awareness and compliance. Strengthening monitoring efforts would enhance the ability to achieve targeted pest management objectives more effectively. However, the resource intensity is expected to be moderate, as effective monitoring requires staff capacity, capability, and financial investment to improve skills and utilise state-of-the-art monitoring and surveillance approaches (see below). This also involves further coordination of monitoring activities and, where necessary, addressing gaps in existing data through additional monitoring efforts.

### **Monitoring gaps and data deficiencies**

Our data analysis (see Figure 26) indicates that ORC's monitoring efforts have largely concentrated on a small number of well-known pests, such as rabbits, old man's beard, and bomarea. As a result, there are notable data deficiencies for many other pests. This finding aligns with ORC's own concerns regarding the underperformance of monitoring activities.

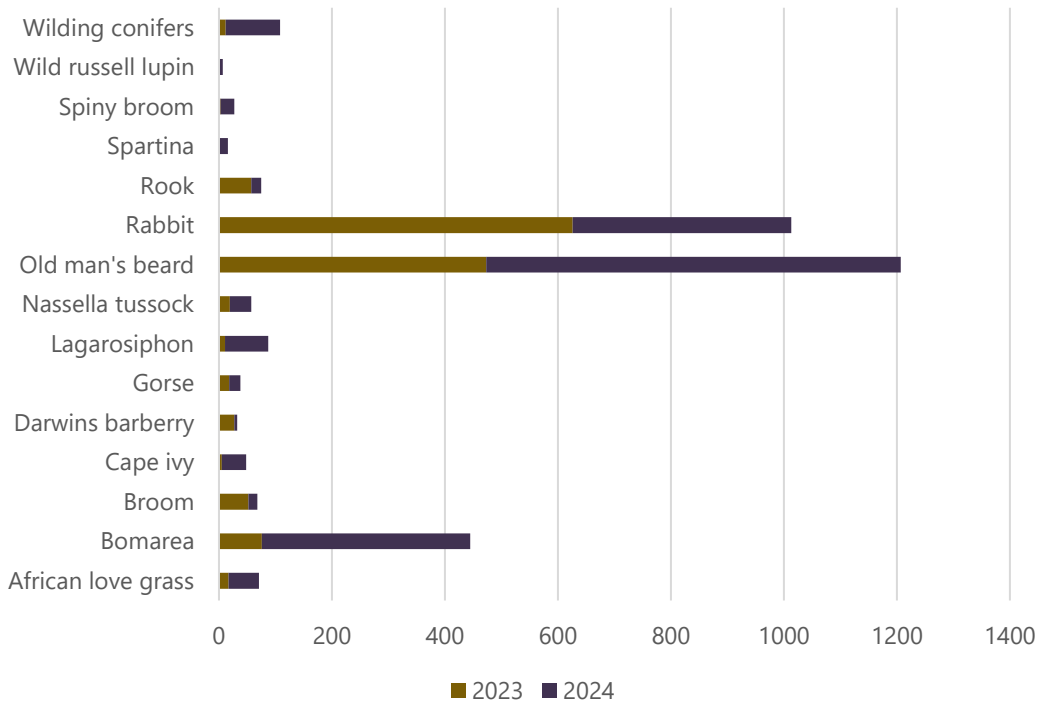
Data deficiencies exist for several RPMP pests, for instance where we noted that the available data was inconclusive for assessing the status of species such as boneseed, bur daisy, cape ivy, perennial nettle, nodding thistle, and ragwort. Additionally, there are further data gaps for plant pests like Russell lupin and for those targeted under site-led programmes.

This lack of comprehensive data presents a significant challenge. As ORC has also highlighted, the absence of sufficient monitoring data undermines the ability to evaluate whether the RPMP's policies and strategies are appropriate and effective in addressing biosecurity threats. Without robust, reliable data, it becomes difficult to accurately assess the success of pest management efforts or make informed adjustments where necessary.



a specific range of pests such as old man’s beard, rabbits, bomarea, wilding pines or rooks. However, we note that this will not pose a challenge if those pests reflect actual priorities. These emerging findings can suggest an inefficient approach to pest monitoring, which is an important foundation of pest management and meeting the RPMP pest objectives. We provide monitoring-specific recommendation in the following section.

Figure 26: RPMP-pest related number of monitoring and inspections by ORC in 2023 and 2024



Source: Sapere calculations based on data received from ORC. 2024 data is limited until October, the time the data were requested by Sapere.

## 6.5.1 Recommendation to improve effectiveness

### Filling data gaps

- Engage landowners, citizen science, and stakeholders in monitoring and surveillance efforts. Stakeholder consultations have highlighted that many groups are already monitoring specific pests across Otago. It would be beneficial for ORC to collaborate with them rather than operate independently following a citizen science data collection approach. Such efforts could focus on areas where monitoring would require significant upfront investments and running costs, but also where the most imminent gaps in pest data exist. For example, in the proposed ungulate management plan for the Marlborough Sounds, a network of informed and engaged citizens will be contacted on a regular basis to provide a structured evaluation of the success of the programme. This will be much more cost-effective than monitoring a network of trial plots. Evaluative approaches, which incorporate more subjective data, are also becoming more widely used in assessing effectiveness of environmental programmes in Australia.

- At the time of writing the report, Greater Wellington encourages public involvement in pest identification, focusing on specific pests where data is limited. They offer incentives, such as NZ\$20 vouchers for regional plant nurseries, to individuals who successfully identify listed pests in areas previously unreported by the authority. DOC used a similar reward-based approach in conjunction with Nelson City and Tasman District Councils to incentivise citizen participation in their successful campaign to eradicate giant white butterfly (Phillips et al., 2020). ORC could consider similar approaches, focusing on citizen science and community empowerment.
- Understanding the scope, detail, and coverage of this data would be a valuable first step in achieving comprehensive monitoring while avoiding duplication of efforts.

### **Enhancing monitoring through outcome tracking**

Currently, ORC's focus is primarily on activity and output-based KPIs, which measure the completion of tasks rather than the effectiveness of interventions. There is considerable merit in introducing outcome monitoring to complement existing KPIs.

Outcome monitoring involves tracking the effectiveness of pest control efforts by measuring changes in pest populations, such as:

- reduction in pest numbers
- prevention of pest spread.

Integrating outcome monitoring would establish a feedback loop for ORC, providing valuable insights into the success of different strategies and informing evidence-based decision-making.

For outcome tracking, ORC can build on their established data infrastructure, particularly using the ArcGIS mapping including the before-and-after tracking of RPMP pests and their infestation levels.

### **Investment and capacity building**

To address current challenges, further investment in monitoring and surveillance technologies is recommended (also raised by stakeholders). Utilising tools such as:

- AI-enabled traps
- drones
- remote sensing.

These technologies would broaden the scope of ORC's surveillance efforts and enhance the biosecurity team's capabilities to carry out surveillance cost-effectively. Investing in AI and drone technology could provide a cost-effective long-term solution for monitoring large areas for various pests, like the approaches used by community groups on the Otago Peninsula.

Additionally, strengthening the role of biosecurity officers and providing them with adequate resources and training will be essential for improving surveillance and monitoring efforts, addressing the raised capacity and capability constraints by ORC.

## 6.5.2 Pest type focus

ORC requires support in prioritising pests for monitoring and surveillance within the plan due to limited resources and the sheer number of included pests. Ideally, economic frameworks such as cost-benefit assessments can help rank pests in order of best return on investment. However, such approaches rely on existing data on pests, associated costs, and the monetised benefits of interventions. Currently, this presents a chicken-and-egg challenge – effective prioritisation requires data, but gathering that data depends on having a prioritised monitoring approach.

- To address this challenge, one recommendation for ORC is focusing on identifying gaps in pest data coverage and areas where community engagement is lacking. These gaps can then guide the prioritisation of monitoring and surveillance efforts. Identified gaps exist for plant pests: boneseed, bur daisy, cape ivy, perennial nettle, nodding thistle, and ragwort, as well as for Russell lupin and site-led programme plant pests.
- There is a risk that significant areas and pests remain unidentified. To mitigate this, prioritisation can focus on areas with high biodiversity value and/or economic and cultural value, ensuring public support for pest management initiatives.
- Alternatively, a simplified approach could either prioritise pests in unidentified areas with biodiversity, cultural or economic value within the current RPMP that have the highest risk to spread fast if uncontrolled or focus on targeting pests for surveillance and monitoring efforts that are lower on the incursion curve. Early intervention in such cases would prevent pests from becoming established, leading to lower long-term management costs and a greater overall impact.

## 7. Recommendations for the next RPMP

We split our recommendations for the next iteration of the RPMP into pest specific and strategic programme recommendations. Recommendations were developed alongside feedback from stakeholder interviews, and from two stakeholder workshops focusing on recommendation development (see Appendix D for details).

### 7.1 Summary of key findings

#### Recommendations for the next RPMP

The next iteration of the RPMP should focus on revising rules for pests where there is evidence of opportunities to improve effectiveness (this relates to the good neighbour rule for wilding pines, rabbits, and gorse and broom). Further, it should expand to pests which are currently not included in either the RPMP (marine pests), or beyond site-led programmes (possums, goat, deer).

**At the programme level, we believe that ORC can improve the effectiveness of the next RPMP by:**

- improving coverage of data to improve RPMP effectiveness
- refining scope and extending the number of site-led programmes.

**ORC may further consider a shift in pest management, which would require further testing. This could involve:**

- an integrated pest management approach, leveraging existing catchment areas.

We note that this is not a role of the RPMP, rather, it would be a consideration at the policy and biosecurity strategy level. However, there is strong evidence from the stakeholder interviews that such an integrated pest management approach has potential to improve the effectiveness of future RPMPs.

#### Pest specific recommendations, including good neighbour rule recommendations

##### *Wilding pines*

- We recommend revising the good neighbour rule for wildings pines. Various stakeholders noted that the good neighbour rule is not sufficient, focusing only on 200m while pine seeds can travel up to 20km. Some stakeholders suggested increasing the good neighbour rule distance to two or three kilometres to make the rule more effective. We suggest ORC revisit this good neighbour rule, but also consider the practicability and enforceability of these suggestions.
- It was raised that wilding pine control, considering funding cuts to the national programme, may require raising rates to improve long-term control and enforcement of RPMP rules relating to wilding pines.

##### *Wallabies and wilding pines*

- Wilding pine and wallaby control under the RPMP goes hand in hand with the national wilding pine and wallaby programmes, and thus need sustainable funding. Funding cuts to

both will have negative consequences for the efforts undertaken in Otago, and by ORC. This is a very important external factor which is of major importance for the next RPMP, as well as ORC's ability to effectively deliver against future targets and sustain their current investments.

#### *Rabbits*

- Stakeholders raised that ORC may consider an adaptable approach, shifting from no service delivery at present, to providing at least control work in areas in Otago of known public under-compliance to rabbit rules and/or where rabbit numbers are historically high and hard to control.

Consideration could be given to modifying the good neighbour rule for rabbit control. Currently, the good neighbour rule mandates that occupiers, including public land, reduce rabbit infestations to level 3 on the MMS, or below if neighbouring occupiers have achieved the same level of infestation control.

To promote fairness, acknowledge investments made, and enhance effectiveness, a modified good neighbour rule could instead require occupiers to reduce rabbit populations to the same level as that achieved by the most successful neighbouring occupier, i.e. if the most successful neighbouring occupier reduces to level 2, the equivalent should be aimed for by the occupier. Further testing of this approach is recommended.

#### *Gorse and broom*

- Making better use of the good neighbour rule by expanding gorse and broom control from rural areas into residential areas. Stakeholders gave examples of known large blocks of land zoned as residential areas infested with gorse and broom and negatively effecting neighbouring areas.

### **General revision of good neighbour rules**

Good neighbour rules would benefit from revision to improve equity and outcomes.

- Stakeholders have raised concerns that while private landowners made investments to control GNR pests, adjacent public land is not always compliant with GNR rules. This is partly due to ORC's limited ability to enforce GNR compliance on public land.

### **Consideration of new pest species**

- The threat of maritime species to Otago was raised by stakeholders. Maritime pests are currently not included in the RPMP. Maritime pests included in Southland's RPMP which are known to pose a threat in Otago, such as undaria, Mediterranean fanworm, clubbed tunicate or Asian paddle crab could be considered.
- Other plant pest species were raised by stakeholders that could be given consideration. Box thorn and hornwort were specifically mentioned as an issue on the Otago Peninsula. Further, hogweed, briar rose thyme, buddleia and cotoneaster were also raised by stakeholders. We note that pest incursion levels vary by areas and geography. The extent of these pests across Otago would need to be assessed first.

- Animal pests such as feral pig, deer, feral cats, possum and feral goats, which are at present included as site-led programme pests, were raised by stakeholders as pests that should be moved to one of the four RPMP programmes, such as sustained control, instead of site-led programme as under the current RPMP. This is due to the increased prevalence of and damage caused by these pests across Otago.
- For possums, if considered for inclusion into one of the four pest programmes, stakeholders suggested following Waikato’s example of including a good neighbour rule (Waikato Regional Council, 2024).<sup>12</sup>

### 7.1.1 Strategic recommendations and suggestion

We have identified the following two strategic recommendations and one suggestion for the future RPMP, in order of priority.

#### Recommendation

- Improving coverage of data to improve effectiveness.
- Refining scope and extending the number of site-led programmes.

#### Suggestion for consideration

- An integrated pest management approach, leveraging existing catchment areas.

Specific recommendations are listed in Table 24 below.

Table 24: Programme-level recommendations and suggestions for the next RPMP

<b>Recommendation</b>		<b>Suggestion</b>
<b>Improving coverage of data to improve effectiveness</b>	<b>Refining scope and extending the number of site-led programmes</b>	<b>Integrated pest management approach</b>
<ul style="list-style-type: none"> <li>• Fund an additional full-time equivalent data science officer.</li> <li>• Leverage existing data from repositories, stakeholders, and neighbouring councils to develop a regional data dashboard.</li> <li>• Commission a predictive AI model that integrates data from various sources, updates the dashboard,</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the number of site-led programmes across Otago, varying in size based on local needs and community buy-in. Identify sites not only by recognised biodiversity value but also through local preferences, for example local understanding of need, willingness to participate, or areas of cultural significance and taoka species.</li> <li>• Build on the success of site-led programmes where ORC has taken on a coordinating role.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify value proposition to gauge catchment group/community interest. Decisions should be based on their capacity and willingness.</li> </ul> <p><i>If the value proposition is clear/support exists, establish the approach:</i></p> <ul style="list-style-type: none"> <li>• ORC would provide support and resourcing to catchment groups including community</li> </ul>

<sup>12</sup> Occupiers within the Waikato region are required to control common brushtail possums to a 5 per cent Residual Trap Catch within 500m of land being managed for production and/or environmental purposes, where the adjacent or nearby occupier is taking reasonable measures to manage possums on the land they occupy.

Recommendation		Suggestion
<b>Improving coverage of data to improve effectiveness</b>	<b>Refining scope and extending the number of site-led programmes</b>	<b>Integrated pest management approach</b>
and identifies current and future pest trends. This model should provide real-time estimations of pest concerns, helping ORC and stakeholders to target and prioritise efforts effectively.	<ul style="list-style-type: none"> <li>Sustain funding and provide longer-term financial support for initiatives.</li> </ul>	<p>groups and groups of landowners.</p> <ul style="list-style-type: none"> <li>ORC would ensure that RPMP objectives complement catchment group goals, particularly in biodiversity protection. This would also require formal consultation with the public for the next RPMP.</li> <li>ORC would take a leadership and communication role and focus on emerging pests and enforcement.</li> </ul>

## 7.2 Improving coverage of data to improve effectiveness

Limited access to pest data in Otago hampers effective pest management and targeted prioritisation. This challenge is faced nationwide, yet accessing appropriate data is crucial for understanding where to direct resources to maximise impact.

Stakeholders collect valuable data and are often willing to share it with ORC. Some already contribute to public data repositories such as iNaturalist, the Global Biodiversity Information Facility, or Report a Pest. Additional data sources, such as eDNA, could also provide critical insights.

Integrating this data with ORC records could create a centralised resource, benefiting both the ORC and stakeholders, with access managed to ensure data privacy.

Building on recent ORC investments, including ArcGIS integration and structured data collection under the RPMP, enhanced data sharing would facilitate more targeted pest control, improve monitoring and surveillance, and shift ORC's approach from reactive to proactive management. Furthermore, the establishment of pest baselines and long-term trends would allow more effective assessment of RPMP performance.

### 7.2.1 Recommendation for the effectiveness of the next RPMP

Developing common data-sharing mechanisms and data dashboards will require both time and financial investment. This proposal is positioned as a longer-term initiative with impacts on the future RPMP.

To effectively integrate existing data and develop predictive capabilities, we recommend the following:

- Funding an additional FTE data science officer to manage data sources and liaise with ORC's biosecurity team.

- Establishing existing data repositories and outlining how to integrate them with ORC's system and encourage stakeholders to upload and update to identified repositories (if they are not already doing so). This could be a conditionality where ORC provides funding to stakeholders for pest initiatives. Clearly set out the data requirements.
- Integrating data with neighbouring councils (e.g., Canterbury and Southland), and national sources. This would improve cross-border pest management and facilitate early identification of emerging pests. Both Environment Canterbury and Environment Southland have expressed interest in this collaborative approach.
- Implementing privacy measures using aggregated data, similar to techniques used in the Integrated Data Infrastructure (IDI), ensuring anonymity while maintaining analytical value. For example, coarse aggregation can be applied for large properties to address privacy concerns. Compliance data would remain excluded. Sufficient aggregation of a higher-spatial level should alleviate data privacy issues concerns, i.e. making data de-identifiable.
- Commission a predictive AI model that integrates data, independently updates data from new entries, and based on the data, assess current and future pest spread risks by geographic location. The purpose is to develop a regional dashboard that provides real-time estimations of pests of concern.
- The dashboard/repository would be informed by existing regional data dashboards like in Marlborough District Council (n.d.), which for example displays all pest plants that have been found through confirmed reports.

*Further consideration could be given to:*

- Design the regional dashboard to be accessible to all stakeholders, including private landowners, iwi, and community pest groups. Only if access is shared can the data remain up-to-date and relevant for pest management efforts and monitoring, otherwise the data would remain incomplete, and decisions would be based on incomplete information.

This investment is expected to generate significant cost-effective impacts in the longer term, by enabling more precise monitoring, quicker response times, and improved enforcement, and thus better pest outcomes in the future.

Enhanced data will also provide evidence to evaluate the effectiveness of current KPIs, contributing to the development of a real-time dashboard for adaptive management. ORC would be able to adjust policies and resource allocation based on real-time and predicted outcomes.

While this initiative has clear benefits, it would require substantial resourcing and strategic planning, likely spanning a five-year period. Implementation would ideally commence following the completion of ORC's IRIS commitments.

We roughly estimate that an additional FTE for a data officer with AI, machine learning and modelling skills could cost between \$100,000 to \$120,000 per annum. We estimate the cost for a predictive AI model in the range of \$250,000 to \$350,000 based on recent government proposals for large model developments. ORC would require ownership of and training on how to use this model independently.

## 7.3 Refining scope and extending the number of site-led programmes

Stakeholders have expressed that site-led programmes under the current RPMP are primarily focused around Dunedin, with limited representation across the wider Otago region (i.e. Igarosiphon). They highlighted the need for an increase in the number of site-led programmes to allow for more targeted, localised and effective responses to pest management.

Further, stakeholders raised that a 10-year period without the ability to enact changes is considered unsuitable in such a rapidly evolving field. It was noted that flexibility in adding new site-led programmes over the lifespan of an RPMP could be a suitable approach to stop localised pest incursions, leveraging on motivated communities to act.

Although formal inclusion of new site-led programmes in the current RPMP is limited under the Biosecurity Act 1993, regional councils can explore alternative mechanisms to support local pest control efforts during the plan's lifespan.

One such option is the use of small-scale management programmes (SSMPs) under section 100 of the Biosecurity Act 1993 (New Zealand Legislation, 2023). SSMPs allow councils to manage pests in defined areas where eradication or containment is still feasible. They can be implemented without public consultation and offer a legal, flexible tool to respond to emerging pest threats or community-led initiatives. ORC may consider establishing SSMPs in areas of ecological, cultural, or economic significance, particularly where there is community capacity and interest. We suggest making more use of this policy in a future RPMP to enact more progressive pest control over the RPMP's lifespan.

### **There are benefits of site-led and SSMP approaches**

- Localised responses: programmes tailored to specific areas would enable prioritisation of pests based on local needs.
- Community engagement: local stakeholders could leverage their pest management capabilities, enhancing programme effectiveness.
- Emerging pest management: SSMPs would offer a flexible and responsive method to address new and emerging pests in local areas.
- Coordination and support: building on success from existing site-led programmes. Where ORC has provided coordination, stakeholders reported greater success in pest management outcomes together.

### **Embedding of SSMP consideration in the next RPMP document:**

- Mention SSMPs explicitly in the RPMP as a tool for localised, responsive management.
- Establish criteria in the RPMP for when an SSMP might be used (e.g. early incursion, site of ecological significance, community readiness).

### **Looking across the border: Canterbury's approach to site-led RPMP**

Environment Canterbury's RPMP includes approximately 28 site-led programmes (Canterbury Regional Council, 2018). Environment Canterbury adopts in their RPMP a flexible approach to adding new site-led programmes if required. There is an expectation in their RPMP that additional sites may

be developed beyond the commencement of the RPMP.<sup>13</sup> This model enables adaptation to emerging pest threats without the need for a full RPMP review.

Sites are identified based on two primary criteria, giving a degree of flexibility:

- Recognised values: sites are identified at district, local, or individual levels as holding value or importance (e.g. significant environmental or cultural value).
- Community-led initiatives: community groups or individuals can propose sites for inclusion, reflecting local priorities and concerns.

Environment Canterbury's approach ensures pest management regimes are tailored to specific site needs. Programmes can cover small areas within a single property or span multiple properties with shared pest challenges.

### **7.3.1 Recommendation for the effectiveness of the next RPMP**

- Increase site-led programmes: ORC should consider expanding the number of site-led programmes to address regional pest management gaps. Expansion could follow Canterbury's approach of including sites of various size, depending on local priorities/buy-in, cultural values and places of relevance for local iwi, or the status quo of highest biodiversity value.
- Streamline the process: following Canterbury's model, ORC could implement a process for adding new programmes without requiring a full consultation, provided the impact on individuals' rights and obligations is deemed minor. These programmes could be implemented as SSPMs which do not require consultations. This approach permits early intervention while building on community capabilities and capacities.
- Long-term funding: funding support from ORC for targeted initiatives such as on the Otago Peninsula for possum control showed success. Building on this success, ORC needs to sustain funding and provide longer-term financial support for initiatives, especially longer-term (e.g. three to five year) funding support for local site-led programmes which can lead to effective and sustainable outcomes.
- Strengthen coordination: ORC should take a leading role in coordinating site-led programmes, ensuring stakeholders have the necessary support and resources.

## **7.4 Suggestion: Integrated approach to pest management**

An integrated pest management approach could address key challenges in the current RPMP by improving community engagement, enhancing pest data use, and better prioritising management and surveillance efforts. While integrated pest management is strategic and policy-driven rather than a core RPMP function, its adoption could improve the effectiveness of future RPMPs.

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<sup>13</sup> Environment Canterbury states in their RPMP document that additional site-led programmes may require regulation to guard objectives, for which a plan review may be required. However, the extent of consultation that is required depends on the scope of the site-led programme, especially the scale of impact or the number of persons affected.

Stakeholder interviews and case studies highlight the fragmented nature of current pest management, with inefficiencies, data gaps, and local challenges not systematically addressed. Different rohe face unique pest pressures, but responses are limited to a few site-led programmes.

ORC's existing investment in Integrated Catchment Management Groups across the region (see Figure 27) offers a strong foundation for applying a catchment-based integrated pest management strategy. This would promote coordinated action, empower communities, and align pest control with ecological boundaries.

### **Suggested action: implement a catchment-based integrated pest management approach**

This approach could enhance collaboration, align with local goals, and support long-term pest control. We recommend ORC test this strategy with stakeholders (e.g. catchment groups and the community) and pilot it in a more advanced catchment group, such as the Catlins. Key elements should include:

- clear value proposition: show how pest control supports catchment group goals (e.g. water quality, biodiversity). Participation should be voluntary and based on local interest and capacity.
- goal alignment: ensure RPMP objectives align with catchment goals. Identify priority pests locally, using existing monitoring data. Alignment would require consultation with the public/catchment groups as part of planning the next RPMP.

### **ORC's role in the integrated pest management approach**

- Leadership: strengthen communication and facilitate broader stakeholder involvement.
- Support: provide technical advice and funding to avoid overburdening groups.
- Emerging pests: focus efforts on early-stage incursions, compliance, and enforcement. Catchment groups would focus on the management of prioritised local pest issues.



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## Appendix A Documents received/reviewed

In alphabetical order, listed are documents and data received from ORC and reviewed for the assessment of the effectiveness of the RPMP.

Table 25: Documents and data received from ORC

<b>Documents and data received from ORC</b>
• <i>2020-21 Biosecurity Operational Plan Annual Report</i>
• <i>2020-21 Otago RPMP Operational Plan FINAL</i>
• <i>2020.10.14 Biosecurity and Rural Liaison Committee Report</i>
• <i>2021 Biosecurity Compliance Policy Initial</i>
• <i>2021-22 Biosecurity Operational Plan Annual Report</i>
• <i>2021-22 Biosecurity Operational Plan version 2</i>
• <i>2021-22 Council Paper for Biosecurity Operational Plan</i>
• <i>2021.03.10 Biosecurity and Rural Liaison Committee Report</i>
• <i>2021.09.08 Environmental Implementation Committee Report</i>
• <i>2021.12.08 Environmental Implementation Committee Report</i>
• <i>2022-23 Biosecurity Operational Plan Annual Report</i>
• <i>2022-23 Biosecurity Operational Plan version 1</i>
• <i>2022-23 Council Paper for Biosecurity Operational Plan</i>
• <i>2022.03.09 Environmental Implementation Committee Report</i>
• <i>2022.06.09 Environmental Implementation Committee Report</i>
• <i>2022.09.15 Environmental Implementation Committee Report</i>
• <i>2023-24 Biosecurity Operational Plan Annual Report</i>
• <i>2023-24 Biosecurity Operational Plan approved</i>
• <i>2023-24 Council Paper for Biosecurity Operational Plan</i>
• <i>2023.02.02 Environmental Implementation Committee Report</i>
• <i>2023.05.11 Environmental Implementation Committee Report RWCS logic</i>
• <i>2023.11.08 Environmental Implementation Committee Report (Wilding Conifers)</i>
• <i>2024-25 Biosecurity Operational Plan approved</i>
• <i>2024-25 Council Paper for Biosecurity Operational Plan</i>
• <i>2024.02.08 Environmental Implementation Committee Report (Site-led)</i>
• <i>2024.05.08 Environmental Implementation Committee Report (Wallabies)</i>
• <i>2024 Biosecurity Compliance Policy Revised</i>
• <i>Before and After Inspections</i>
• <i>Biosecurity End-2-End Process (July 2024)_Working RER</i>
• <i>Biosecurity Actuals and Budget for RPMP Review</i>
• <i>BOP KPIs 2021-22 Tracking-RER</i>
• <i>BOP KPIs 2022-23 Tracking-RER</i>

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- *BOP KPIs 2023-24 Tracking-RER*
  - *Current Org Chart Environmental Implementation\_1 Oct 2024*
  - *Decision for Change Environmental Implementation\_6 June 2021*
  - *Long-term-plan-2021-2031-consultation-document*
  - *Long-term-plan-2024-34-deloitte-25-july-rdc-1*
  - *Locations\_Inspections\_Composite\_RPMP\_Review\_ByYear*
  - *Locations\_Inspections\_Composite\_RPMP\_Review\_ByYear*
  - *Monitoring and Surveillance Action Plans 2024-25 – FINAL*
  - *Monitoring and Surveillance Guidance Document – FINAL*
  - *ORC Biosecurity Compliance and Enforcement Policy 2.0\_Final*
  - *ORC Long Term Plan 2018-2028*
  - *orc-regional-pest-management-plan-2019-29\_final\_corrected-21*
  - *Proposal for Change\_Biosecurity and Rural Liaison\_20 April 2021*
  - *Recommendation Criteria Table-Officer Guide (July 2024)\_RER*
  - *Recommendation Guide\_Letters Use\_RER*
  - *Spartina Example*
  - *Spiny Broom Report (2021-22)*
  - *State of Pest Management in Otago 2023*
  - *Wallabies\_RPMPReview\_ControlOperations*
  - *WildingConifers\_RPMPReview\_ControlOperations*
-

## Appendix B List of RPMP pest species

The Otago Pest Management Plan identified 51 species to be managed by land occupiers. These species are (note Bennett's Wallaby is counted twice as per the Otago Pest Management Plan document which states the below 51 pest species):

- |   |   |
|---|---|
| 1. African feather grass                | 28. Hedgehog                              |
| 2. African love grass                   | 29. Hornwort                              |
| 3. Banana passionfruit                  | 30. Lagarosiphon                          |
| 4. Bennett's wallaby                    | 31. Maritime pine                         |
| 5. Bennett's wallaby (site-led animals) | 32. Moth plant                            |
| 6. Bishop pine                          | 33. Mountain pine and dwarf mountain pine |
| 7. Bomarea                              | 34. Mustelids                             |
| 8. Boneseed                             | 35. Nassella tussock                      |
| 9. Broom                                | 36. Nodding thistle                       |
| 10. Bur daisy                           | 37. Old man's beard                       |
| 11. Cape ivy                            | 38. Perennial nettle                      |
| 12. Chilean flame creeper               | 39. Ponderosa pine                        |
| 13. Chilean needle grass                | 40. Possum                                |
| 14. Contorta (lodgepole) pine           | 41. Radiata pine                          |
| 15. Corsican pine                       | 42. Ragwort                               |
| 16. Darwin's barberry                   | 43. Rats                                  |
| 17. Douglas fir                         | 44. Rooks                                 |
| 18. Egeria                              | 45. Russell lupin                         |
| 19. European larch                      | 46. Scots pine                            |
| 20. False tamarisk                      | 47. Spartina                              |
| 21. Feral cat                           | 48. Spiny broom                           |
| 22. Feral deer                          | 49. Sycamore                              |
| 23. Feral goat                          | 50. Tradescantia                          |
| 24. Feral pig                           | 51. White-edged nightshade                |
| 25. Feral rabbits                       |   |
| 26. Gorse                               |   |
| 27. Gunnera                             |   |

## Appendix C Data assessment

We apply the framework of the U.S. Federal Committee on Statistical Methodology (2020) to evaluate whether the data collected and provided to us by ORC meets the quality standards necessary for analysing RPMP outcomes.

The RPMP outcomes are defined in our logic model as compliance with regulations and pest management results. The data included is:

- pest monitoring and inspection data received from ORC spanning the RPMP period from inception until October 2024
- compliance data extracted from received ORC annual biosecurity operational plans from 20/21 until 23/24
- limited before-and-after inspection data on pest compliance and infestation levels (predominantly old man’s beard and rabbits) spanning November 2022 to September 2024.

Our data assessment is tailored to our specific user needs, i.e. analysing the programme outcomes, and spans the period from the RPMP’s inception in 2019 to the present.

The framework consists of three domains: utility, objectivity, and integrity. *Utility* relates to the data's relevance and usefulness for our analysis. *Objectivity* considers whether the data is accurate, reliable, and free from bias. *Integrity* concerns data protection against manipulation and unauthorised access, however, this domain is not pertinent to our work and will not be assessed.

For our purposes, we evaluate utility and objectivity through their specific dimensions. The dimensions of utility include relevance, accessibility, timeliness, and granularity.<sup>14</sup> For objectivity, we assess data accuracy, reliability, and coherence. The assessment is qualitative, deliberately avoiding any ranking, scoring, or weighting of domains and dimensions. While the framework uses a binary assessment, i.e. a dimension is met or not, we adapt the scoring to reflect partial achievement where applicable to reflect improvement made over time but also the complexity of collecting pest data (e.g. changes in data collection methods by ORC were made over the course of the RPMP, to shift from not achieved to achieved or where for some pests the assessment works whereas not for others).

Table 26 provides an overview of this adapted framework, including each domain, its dimensions, and their definitions as relevant to our analysis.

Table 26: Data quality framework

Domain	Dimension	Definition
Utility	Relevance	The data is pertinent to our assessment of pest management outcomes
	Accessibility	The data is provided in a clear, understandable format

<sup>14</sup> We exclude the dimension of *punctuality* from the utility domain, as it pertains to the time lag between the planned and actual release of data, which is not relevant to our assessment.

	Timeliness	The lag between events (e.g., monitoring visits) and data availability
	Granularity	The level of data disaggregation, such as by time period and geographic area
Objectivity	Accuracy and reliability	The degree to which data closely represents its true values and the consistency of data results over time
	Coherence	The ability of the data to adhere to consistent definitions and standards

The data assessment (Table 27) reveals limitations in understanding the current state of RPMP pests in Otago or evaluating compliance. While the data meets criteria for granularity, timeliness, and accessibility, it can be improved in terms of relevance, accuracy, reliability, and coherence. Monitoring data is insufficient to assess pest incidence or prevalence comprehensively. However, ORC's recent mapping efforts are a positive development, and this should be supported as it will contribute to a better understanding of pest prevalence and trends

As a result, counterfactual analysis and future projections are not feasible. For our analysis presented in chapter 5, we draw on supplementary data from iNaturalist for pest prevalence analysis, which offers some insights into pest prevalence in Otago before and after the inception of the current RPMP but is subject to selective reporting. We will use the provided ORC compliance data with the caveat of being limited in scope.

It is important to note that despite the limitations of the data, for the purpose of our analysis, ORC have made significant improvements in capturing data over the course of the RPMP. We highlight those improvements below:

## Otago Regional Council is working on improving how they collect data

ORC has made significant progress in improving data collection throughout the RPMP. These advancements have been particularly evident since November 2022, when ORC adopted a more structured approach to data collection. The following notable key improvements have been implemented by ORC since the RPMP inception:

- **Systematic mapping using ArcGIS** to enhance data accessibility and provide valuable insights into the spatial distribution and focus of pest control efforts.
- Changes since November 2022 for all RPMP pests:
  - **Systematic definition of inspection/monitoring visits** to prevent inconsistency in data collection.
  - **Identification and documentation of pest presence and infestation levels**, which is crucial for future pest management evaluations, permitting before-and-after inspection assessments and baseline assessments, the identification of prevalence of pests at visits, and the degree of pest infestation before and after visits.

Building on these positive developments is essential to further strengthen ORC’s pest monitoring and management. We recommend the following improvements:

- **Refine the assessment of pest plants and the definition of infestation density.** There is currently some uncertainty regarding how plant pest infestation levels are scored, which could create challenges when collecting such data among ORC staff, legally enforcing rules or setting KPIs for pest-specific compliance targets.
- **Establish a standardised scoring system and provide regular staff training** to ensure consistent pest assessments. This would help minimise bias in scoring and align staff evaluations with a common framework. Furthermore, this would provide a transparent approach for all stakeholders involved, i.e. those responsible for managing the pests who require an understanding of the infestation levels.

Table 27: Data quality framework: assessment

<b>Domain</b>	<b>Dimension</b>	<b>Assessment</b>
Utility	Relevance	<p><b>Data relevance for our analysis is partially achieved</b></p> <p>Two key data types are essential for our analysis:</p> <ol style="list-style-type: none"> <li>1. Pest prevalence and changes in incidence across Otago.</li> <li>2. Public compliance with RPMP regulations.</li> </ol> <p>At baseline of the RPMP and until 2021 monitoring and inspection data neither indicate pest presence nor their absence. Since 2021 pest presence and grading are present in GIS database. While pre 2021 data would not fulfil the relevance criteria for prevalence, post and current data do so.</p> <p>Monitoring visits and inspections, and accordingly compliance reporting, follow a hotspot and snowball approach, focusing on areas with prior reports or specific pests that were already included in past RPMP iterations with existing public awareness (e.g. old man’s beard, gorse, broom, and rabbits). This method restricts data coverage to certain areas and a limited subset of pests. We suggest in our report to consider supplementing ORC data with citizen science and from available data repositories such as iNaturalist.</p> <p>Advances over the course of the current RPMP in how ORC collect data are clear, for example GIS mapping of pests and building a before-and-after assessment based on the plant or rabbit infestation level. While these advances are important and supportive for the effectiveness of the RPMP, the number of before/after comparisons for pests other than rabbits is limited so confidence in any change is likely to be low. As such it remains a challenge to identify the with certainty the degree of infestation levels for other RPMP pests and public compliance to rules other than rabbit infestations.</p>
	Accessibility	<p><b>Accessibility of data is achieved</b></p> <ul style="list-style-type: none"> <li>• ORC provided the data in an easy-to use format for our assessment.</li> </ul>

		<ul style="list-style-type: none"> <li>• ORC further provided metadata and explanations alongside the data sources which facilitated use of the data.</li> </ul>
	Timeliness	<p><b>Timeliness of data is achieved</b></p> <ul style="list-style-type: none"> <li>• Coverage of data points is complete from 2019 until most recent data in October 2024. Most recent refers to most recently seen by Sapere but data capture and management continues to the present</li> </ul>
	Granularity	<p><b>Granularity of data is achieved</b></p> <ul style="list-style-type: none"> <li>• Data has high granularity, up to seconds in time units.</li> <li>• Data has specific geospatial identification enabling detailed geospatial mapping of the observation.</li> </ul>
Objectivity	Accuracy and reliability	<p><b>Data accuracy and reliability is partially achieved</b></p> <p>During the first two years of the RPMP, data accuracy and reliability was limited by different approaches to counting inspections visits, making it difficult to establish the actual number of inspections, and compliance levels. However, since then, ORC has made significant improvements in data collection, leading to greater accuracy and reliability. It is essential that these improvements continue to be built upon.</p> <p>While the initial period faced challenges, including variations in data collection methods and differently counting observations, ORC has since introduced clearer definitions and standardised processes. Inspections are now distinct from monitoring activities, with inspections leading to compliance outcomes, whereas monitoring records pest presence or absence. Current data systems, including GIS dashboards, provide accurate information on the number of monitoring visits, inspections, and their compliance status.</p> <p>Due to the focus on specific pest types in inspections, there is limited reliable and accurate data available beyond those pests; for compliance, only rabbit data are reliable in terms of confidence in interpreting before and after data.</p> <p>Further efforts should focus on ensuring biosecurity officers apply the pest infestation scale consistently. While the introduction of a subjective pest infestation scale beyond the MMS scale used for rabbits is a positive development, variability in application remains a concern. To mitigate this, regular training sessions should be implemented to enhance officers' understanding and application of the scale. Additionally, the MMS scale for rabbits, although subjective, has established literature and guidelines, providing a solid foundation for consistency. Due to the focus of specific pest types in inspection, there is limited reliable and accurate data available beyond those pests; for compliance, only rabbit data are reliable in terms of confidence of interpreting before and after data.</p>
	Coherence	<p><b>Data coherence is partially achieved</b></p>

		<p>Data coherence has improved over time. Initially, there were challenges with shifting definitions, particularly in measuring pest prevalence. Early data collection relied on a binary presence/absence measure, which determined compliance as non-compliant if pests were present. Subsequently, a subjective plant and pest infestation scale was introduced to provide more detailed assessments. This scale introduced variability in application, ORC uses the MMS scale for rabbits which has a well-established body of literature and guidelines, allowing it to be treated as quasi-objective.</p>
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## Appendix D Stakeholder and ORC engagement

In collaboration with ORC, we identified a representative sample of public, private, iwi, NGO, and community groups essential to understanding the effectiveness of the RPMP across all five programme streams. We developed interview questions tailored to the different stakeholder groups. The questions were reviewed and approved by ORC.

We conducted 20 interviews with stakeholders from the public and private sector, iwi, and NGOs. The interviews aimed to highlight what is working well, identify areas for improvement, and explore key factors.

We further conducted two 90min long online workshops with stakeholders to discuss recommendations to enhance the current RPMP. We present a list of these stakeholder in this appendix.

We conducted narrative analysis aligned with the three core research questions (effectiveness, opportunities to improve effectiveness, considerations for the next RPMP iteration) and the evaluation questions. Our findings fed into the effectiveness assessment in chapter 5. We further conducted an evaluation question-specific analysis of which findings are presented in this appendix.

We provide below a list of stakeholders engaged in the interview process, as well as the interview questions.

Table 28: List of engaged stakeholders

Group	Stakeholder	Comments
Public sector land occupiers	<ul style="list-style-type: none"> <li>• District councils</li> <li>• NZTA</li> <li>• Kiwirail</li> <li>• MPI</li> <li>• LINZ</li> <li>• DOC</li> <li>• ORC</li> <li>• Environment Canterbury and Environment Southland</li> </ul>	All were interviewed
Private sector land occupiers	<ul style="list-style-type: none"> <li>• Beef and lamb</li> <li>• Ernslaw One</li> </ul>	HortNZ missed the interview and provided us with a written response to the questions
NGOs	<ul style="list-style-type: none"> <li>• Forest and Bird</li> <li>• OSPRI</li> <li>• Whakatipu Wilding Control Group</li> <li>• Southern Lakes Sanctuary</li> <li>• Otago Peninsula Biodiversity Trust</li> <li>• Predator Free Dunedin and SWAT</li> <li>• Rabbit Group Moeraki</li> </ul>	Two other rabbit-focused community groups were not available for interviews; however, we felt that we had sufficiently captured related

	<ul style="list-style-type: none"> <li>Catlins Integrated Catchment Group</li> </ul>	information in other interviews.
Iwi	<ul style="list-style-type: none"> <li>Aukaha/mana whenua</li> </ul>	Provided a coordinated response from rūnaka members
ORC councillors	<ul style="list-style-type: none"> <li>Two councillors</li> </ul>	Interviewed together

Table 29: Interview questions set one

**Set one: Questions for public/private sector occupiers, NGOs / community groups, and Iwi**

<p><b>General questions</b></p> <p><b>(All stakeholders apart from ORC staff)</b></p>	<p><b>Involvement in pest management</b></p> <p>1. Could you describe your involvement in pest management in Otago?</p> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>Which pest species are you primarily focused on?</li> <li>What is your overall view of the pest situation in Otago? What pests are getting better and what are getting worse?</li> </ul> <p><b>Impact of the RPMP</b></p> <p>2. Are you aware of the RPMP and how do you use it?</p> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>How has the Regional Pest Management Plan (RPMP) influenced pest management activities in your experience?</li> <li>In what ways, if any, have your responsibilities changed since the introduction of the RPMP?</li> <li>How would you characterise the collaboration with other stakeholders in relation to the RPMP?</li> </ul> <p><b>Contribution and outcomes of the RPMP</b></p> <p>3. Could you share any notable outcomes related to pest management that you believe may be connected to the RPMP? <i>Probe: these can be failure or success</i></p> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>What are your thoughts on the overall effectiveness of the RPMP in meeting its objectives?</li> <li>How would you describe public awareness and engagement in pest management since the RPMP's implementation?</li> <li>Have you noticed any changes in actions or compliance related to pest management rules? If so, could you elaborate?</li> <li>How has the RPMP contributed to knowledge sharing and best practices in pest management?</li> </ul> <p><b>Challenges and improvements</b></p>
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	<ol style="list-style-type: none"> <li>4. What aspects of the RPMP implementation process have been particularly effective in your experience?</li> <li>5. What challenges, if any, have you encountered while working within the RPMP framework?</li> </ol> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>• In your opinion, how might the RPMP be enhanced to support pest management efforts?</li> </ul> <p><b>Future considerations</b></p> <ol style="list-style-type: none"> <li>5. What lessons from the current RPMP could inform the development of the future RPMP?</li> </ol>
<p><b>Additional questions for:</b></p> <p><b>Public sector land occupiers</b></p>	<p><b>RPMP impact and integration</b></p> <ol style="list-style-type: none"> <li>1. How has the RPMP influenced pest management strategies in your field of work?</li> <li>2. Could you describe how you approach balancing RPMP requirements with other land management priorities?</li> </ol> <p><b>Support and resources</b></p> <ol style="list-style-type: none"> <li>3. How would you assess the availability of resources and support for implementing the RPMP?</li> </ol> <p><b>Integration and collaboration</b></p> <ol style="list-style-type: none"> <li>3. How well does the RPMP integrate with other regional pest management programmes and biosecurity strategies?</li> <li>4. How has the RPMP impacted cross-boundary pest management efforts with neighbouring regions?</li> </ol>
<p><b>Additional questions for:</b></p> <p><b>Private sector land occupiers</b></p>	<p><b>RPMP impact on practices</b></p> <ol style="list-style-type: none"> <li>1. How has the RPMP affected your land management practices?</li> <li>2. What has been your experience with adhering to RPMP requirements?</li> </ol> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>• What barriers and facilitators have you encountered?</li> </ul> <ol style="list-style-type: none"> <li>3. In what ways, if any, has the RPMP affected costs or productivity in your work?</li> </ol> <p><b>Support needs</b></p> <ol style="list-style-type: none"> <li>4. What additional support would help you meet RPMP obligations?</li> </ol>
<p><b>Additional questions for:</b></p>	<p><b>Cultural alignment and practices</b></p>

<b>Iwi</b>	<ol style="list-style-type: none"> <li>1. How has the RPMP affected the management of culturally significant species or areas?</li> </ol> <p><b>Inclusion and collaboration</b></p> <ol style="list-style-type: none"> <li>2. In your view, how does the RPMP incorporate and account for Mātauranga Māori?</li> </ol> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>• In what ways could the RPMP better incorporate Mātauranga Māori?</li> </ul> <ol style="list-style-type: none"> <li>3. Should, and if, so how can the RPMP process be more inclusive of Iwi interests?</li> </ol>
<b>Additional questions for: NGOs and community groups</b>	<p><b>Organisational impact</b></p> <ol style="list-style-type: none"> <li>1. How has the RPMP affected your organization's pest management initiatives?</li> </ol> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>• What opportunities has the RPMP created for community involvement?</li> <li>• How has the RPMP impacted funding or resources for your pest management projects? Better or worse?</li> </ul> <ol style="list-style-type: none"> <li>2. What changes in support from ORC would enhance your pest management efforts?</li> </ol> <p><b>Inclusion and collaboration – as for iwi</b></p> <ol style="list-style-type: none"> <li>3. In your view, how does the RPMP incorporate and account for Mātauranga Māori?</li> </ol> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>• In what ways could the RPMP better incorporate Mātauranga Māori?</li> </ul> <ol style="list-style-type: none"> <li>4. Should, and if, so how can the RPMP process be more inclusive of Iwi interests?</li> </ol>

Table 30: Interview questions set two

**Set two: Questions for ORC Staff**

	<p><b>RPMP implementation and oversight</b></p> <ol style="list-style-type: none"> <li>1. Could you describe your role in relation to the Regional Pest Management Plan (RPMP) implementation?</li> <li>2. In your own words, how would you characterise the evolution of RPMP implementation since its introduction?</li> </ol> <p><b>Stakeholder engagement</b></p> <ol style="list-style-type: none"> <li>3. In what ways, if any, has the RPMP influenced ORC's engagement strategies and activities?</li> </ol> <p><i>Probe below if not answered in response:</i></p>
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- How has stakeholder engagement evolved since the RPMP's introduction?
- What are your thoughts on the RPMP's effectiveness in communicating rules and responsibilities to occupiers and landowners?

**Coordination and collaboration**

4. How well does the RPMP integrate with other regional pest management programmes and biosecurity strategies?

*Probe below if not answered in response:*

- How has the RPMP impacted cross-boundary pest management efforts with neighbouring regions?
- How has coordination between ORC and other regional councils or national bodies evolved since the RPMP's introduction?

**Monitoring and surveillance**

5. How would you describe the current pest surveillance and monitoring strategies implemented under the RPMP?

*Probe below if not answered in response:*

- How does ORC prioritise areas or species for surveillance efforts?
- How effective have the inspection, monitoring, and surveillance activities been in ensuring compliance with RPMP rules?
- What challenges, if any, has ORC faced in conducting comprehensive pest surveillance across the region?
- What improvements, if any, do you think could be made to enhance the effectiveness of ORC's pest monitoring and surveillance programmes?

**Enforcement and compliance**

6. How would you describe the impact of the RPMP on ORC's enforcement strategies and activities?

*Probe below if not answered in response:*

- What has been your experience with ensuring compliance across different stakeholder groups?
- In your view, how has the RPMP influenced pest management compliance and action requirements?

**Resources, capacity, and capability**

7. In your view, does ORC have sufficient resources, capabilities, and capacities to effectively deliver the objectives of the RPMP, and if not, what specific areas require improvement?

*Probe below if not answered in response:*

- Can you assess the capability and capacity of the ORC to effectively deliver the RPMP?

	<ul style="list-style-type: none"> <li>• How would you evaluate the level and quality of training and support provided to ORC staff for RPMP enforcement?</li> <li>• What are your views on the adequacy and efficiency of resource allocation for RPMP implementation?</li> <li>• Have there been any challenges or successes in aligning resource allocation with RPMP objectives?</li> </ul> <p><b>Adaptive management</b></p> <p>8. How does ORC approach the incorporation of new scientific information or emerging pest threats into the RPMP framework?</p> <p><b>Effectiveness of the RPMP</b></p> <p>9. What are your thoughts on the RPMP's progress towards achieving its pest objectives by 2029?</p> <p><i>Probe below if not answered in response:</i></p> <ul style="list-style-type: none"> <li>• In your opinion, what factors have contributed to the RPMP's impact on pest management objectives? (this may be both strengths and weaknesses)</li> </ul> <p><b>Future planning</b></p> <p>10. Based on your experience, what considerations do you think might be important for the next iteration of the RPMP?</p>
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We provide in Table 31 below a list of the stakeholders that were present in our two 90-minute online workshops. We note that invited more stakeholders than those that participated in the workshops. The workshops tested our recommendations with the stakeholders on their relevance, completeness, feasibility to implement, and any additional insights stakeholders wanted to share.

Table 31: Workshop participants

Group	Stakeholder
Public sector land occupiers	<ul style="list-style-type: none"> <li>• Dunedin District Council</li> <li>• Land Information New Zealand</li> <li>• Department of Conservation</li> <li>• Otago Regional Council</li> </ul>
NGOs	<ul style="list-style-type: none"> <li>• Forest and Bird</li> <li>• Southern Lakes Sanctuary</li> <li>• Predator Free Dunedin</li> <li>• Seek Weeds and Terminate</li> <li>• Rabbit Group Moeraki</li> <li>• Catlins Integrated Catchment Group</li> </ul>

We provide in the table below the detailed thematic analysis of our stakeholder interviews by stakeholder group and evaluation question. **We note that the data presented in the table are stakeholder observations.** Where we have used information from the stakeholder interviews in chapter 5, we have triangulated stakeholder opinions with other evidence. We consider it important to provide thematic information from stakeholders below.

Table 32: Findings from the thematic analysis of interviews by stakeholder group and evaluation question

	Public Sector	Public Sector ORC	Private Sector	NGO	Iwi
Do ORC staff have sufficient support, capacity, and capability to deliver the RPMP?	Public sector interviewees cite resource and capability challenges at ORC. Particularly, staff turnover and funding constraints have limited the effectiveness of the RPMP's implementation. Interviewees noted there is insufficient monitoring and enforcement resources to properly enforce pest management protocols. Interviewees were generally of the view that good progress has been made with additional funding for some initiatives, particularly the wallaby programme, the overall capacity to manage a growing number of pests is insufficient. Interviewees cited challenges with pests such as gorse and broom, due to limited enforcement and resources.	Interviewees cite resourcing challenges at ORC, noting a shortage of personnel and tools required to meet RPMP objectives. It was noted that ORC have invested in new roles, including specialists for marine and terrestrial ecosystems and community coordinators, the scale of biosecurity challenges still exceeds current resourcing. Interviewees also highlighted inefficiencies in resource allocation and planning, leading to reactive rather than proactive pest management. For example, surveillance and monitoring have been described as "non-existent" for many pests until recent efforts were initiated.	Private sector interviewees expressed a view that ORC has gaps in capacity and capability to deliver the RPMP. They were of the view that ORC had a persistent issue with staff turnover, undermining continuity, and institutional knowledge. This hinders ORC's ability to effectively engage private landowners. While some stakeholders appreciate ORC's funding support for specific initiatives, the overall impression is that ORC is reactive and insufficiently proactive in managing pest-related issues, particularly for species like wilding pines.	Interviewees stated there are significant challenges in ORC's capacity to deliver the RPMP effectively. While ORC staff demonstrate technical expertise in areas like GIS mapping and monitoring tools, there are critical gaps in enforcement capacity and long-term funding. The reliance on volunteers without sufficient professional support exacerbates volunteer fatigue, which is a recurring concern. NGOs have highlighted that community groups are perceived as often filling gaps left by the council.	While ORC has allocated funding for initiatives such as hui and working groups, there is limited transparency about how the budget is used and whether it aligns with Māori priorities.
What is the impact (awareness and compliance) of the RPMP on key populations?	Interviewees expressed a view that public awareness and compliance is inconsistent. Education and community initiatives have had some success targeting some pests, like rabbits, and in some areas like Moeraki and Gibbston. However, interviewees feel that there is broad confusion about responsibilities and roles between local, regional, and district councils. Many landowners and community members remain unaware of the RPMP's provisions, particularly in urban and lifestyle block areas. Enforcement has been limited, with ORC often building on voluntary compliance rather than using its enforcement powers. Consequently, implementation has been patchy.	Awareness of the RPMP's provisions varies among landowners and stakeholders. Rural landowners are generally more aware of their obligations, particularly regarding rabbits and wilding conifers, but urban and lifestyle block owners often lack sufficient knowledge. While education initiatives, such as AMP shows and community events, have improved public understanding in targeted areas, though many stakeholders remain uninformed about specific responsibilities. Compliance enforcement is weak due to limited staff capacity and the perceived unreasonableness of some RPMP rules. For example, landowners are required to eliminate species with long seed lifespans, which many see as unrealistic.	Awareness of the RPMP from private stakeholders is variable. Some stakeholders, like those managing large tracts of land, are often unfamiliar with the RPMP's specific provisions and report that it has had little influence on their pest management strategies. Others, particularly those in the agricultural sector, are aware but are often critical of the RPMP's limited enforcement capabilities. Interviewees advised compliance with pest management rules appears uneven.	Awareness of the RPMP among community groups and landowners varies, with many interviewees reporting minimal familiarity. This limits compliance with pest management rules. For instance, the lack of public awareness about listed pest plants and site-led obligations often results in inaction. Efforts to enforce compliance were described as inconsistent and overly reliant on moral obligations rather than clear mandates. In some cases, landowners have been resistant to pest management initiatives due to unclear or unenforced regulations.	Awareness of the RPMP among Māori and wider communities is low, with the plan described as insufficiently socialised. The interviewee struggled to articulate the RPMP's purpose or navigate its provisions. A simplified, searchable format with clear objectives and pest-specific details could improve accessibility and uptake. The interviewee advised engagement efforts, such as hui and outreach to community groups, are a positive step. However, these efforts need to be more frequent and comprehensive to raise awareness and drive compliance.
What are the critical success factors influencing pest management?	Interviewees identified three critical success factors, including: <ul style="list-style-type: none"> <li>• <b>Collaboration:</b> Strong partnerships, such as those seen in the lagarosiphon control programme in</li> </ul>	Key success factors identified include: <ul style="list-style-type: none"> <li>• <b>Dedicated funding:</b> Investments in roles such as community coordinators and pest specialists are steps forward,</li> </ul>	Key success factor identified include: <ul style="list-style-type: none"> <li>• <b>Strong partnerships:</b> Collaborative models like those between OSPRI and catchment groups highlight the value of integrated pest management efforts.</li> </ul>	Key success factors identified include: <ul style="list-style-type: none"> <li>• <b>Sustained funding:</b> Time-limited funding constrains monitoring and long-term outcomes. For example, rabbit</li> </ul>	Key success factors identified include: <ul style="list-style-type: none"> <li>• <b>Inclusion of Māori perspectives:</b> Ensuring tangata whenua are actively involved in decision-making beyond box-ticking exercises is critical. Integrating cultural</li> </ul>

	Public Sector	Public Sector ORC	Private Sector	NGO	Iwi
	<p>Wanaka, demonstrate the importance of local buy-in and coordinated efforts.</p> <ul style="list-style-type: none"> <li>• <b>Targeted funding:</b> Dedicated funding streams for pests like wallabies and wilding conifers have led to measurable progress.</li> <li>• <b>Community engagement:</b> Education initiatives and proactive communications are seen as essential in overcome awareness and compliance gaps.</li> </ul>	<p>but more funding is required for implementation and enforcement.</p> <ul style="list-style-type: none"> <li>• <b>technological tools:</b> Improved data collection methods, such as GIS mapping and aerial monitoring, are seen as critical for future success. However, these require investment and skilled personnel to operate effectively.</li> <li>• <b>Collaborative approaches:</b> Partnerships with other councils, such as cross-boundary work on wallabies and Nassella tussock, demonstrate the value of coordinated pest management.</li> <li>• <b>Leadership and knowledge retention:</b> Retaining experienced staff and developing clear succession plans are essential to maintain institutional knowledge and stakeholder relationships</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Clear legislative frameworks:</b> Effective enforcement mechanisms are missing in Otago, leading to fragmented and ineffective pest control.</li> <li>• <b>Sustained funding:</b> The absence of long-term, coordinated funding models hampers progress, particularly for resource-intensive species like possums and rabbits.</li> </ul>	<p>management efforts in Queensberry stalled due to inconsistent resources.</p> <ul style="list-style-type: none"> <li>• <b>Community involvement:</b> Groups like Southern Lakes Sanctuary leverage local volunteers effectively, although this model requires professional support to avoid burnout.</li> <li>• <b>Enforcement and coordination:</b> Effective programmes, like those led by OSPRI, demonstrate the value of structured, catchment-level approaches with strong enforcement mechanisms.</li> <li>• <b>Use of technology:</b> Tools like AI-enabled traps and drone mapping have proven valuable but require investment and training to scale.</li> </ul>	<p>values such as Mahika Kai into pest management frameworks can increase relevance and community engagement</p> <p><b>Cross-sector collaboration:</b> Programmes like Predator Free and Jobs for Nature have driven successes in pest control. Strengthened collaboration between ORC, iwi, and other stakeholders is essential for effective implementation</p> <p><b>Clear resource allocation:</b> Transparency about funding use, such as specifying support for Māori businesses or contractors, can foster greater trust and partnership</p>
How does the RPMP align with statutory responsibilities and other pest management strategies?	<p>The RPMP aligns with national policy directions, such as those for wilding conifers and wallabies, but it is less effective at addressing emerging pests and cross-boundary issues. Gaps in marine biosecurity were highlighted as a critical area needing attention. Integration with other strategies, like those led by DOC. is improving but remains informal in many cases.</p>	<p>Interviewees noted, The RPMP aligns broadly with national policies, such as those for wilding conifers and wallabies. However, integration with other regional councils and national bodies is inconsistent. Cross-boundary collaboration is limited, with some stakeholders advocating for biosecurity advisory boards to provide external expertise and align strategies.</p>	<p>Interviewees suggests RMPL's alignment with statutory responsibilities and broader pest management is seen as inadequate. Interviewees, especially those with an understanding of large-scale land management, advised that ORC's exclusion of key species like possums from the pest list undermines biodiversity and disease control efforts. They suggest greater alignment with successful models, such as OSPRI's systematic approach to pest control.</p>	<p>Interviewees stated the RPMP aligns with national and regional pest management frameworks but faces criticism for its narrow scope and lack of flexibility. For example, the omission of pests like feral cats and certain plant species undermines comprehensive biodiversity goals.</p> <p>The approach contrasts with programmes like OSPRI's possum control, which integrates disease management with biodiversity outcomes. Stakeholders suggest adapting elements of these models to strengthen alignment and effectiveness.</p>	<p>Iwi perspectives suggest RPMP aligns with statutory frameworks in a general sense but is less effective at reflecting cultural priorities. For example, areas of cultural significance and taoka species are insufficiently emphasised, limiting iwi engagement in planning and implementation.</p> <p>The lack of explicit provisions for incorporating Māori and Pacific-owned businesses in pest management contracting also represents a missed opportunity to align with government procurement policies.</p>

	Public Sector	Public Sector ORC	Private Sector	NGO	Iwi
What is the impact of the RPMP on interim & end outcomes / what progress has been made towards achieving pest objectives?	<p>The RPMP has had mixed success. While it has facilitated certain pest management actions (e.g., site-led rabbit control in Otago Peninsula), it has struggled to achieve broader outcomes due to insufficient enforcement and resources. Progress has been made on specific pests like wallabies and lagarosiphon, but systemic issues, such as the reinfestation of controlled areas, remain unresolved.</p> <p>Interviewees describe progress as significantly variable. While key successes include:</p> <ul style="list-style-type: none"> <li>Lagarosiphon: Effective containment and local eradication in areas like Wanaka</li> <li>Wallabies: Progress within containment and eradication zones, supported by national funding</li> </ul> <p>However, pests like rabbits and gorse have seen limited improvement due to insufficient enforcement and fragmented efforts</p>	<p>Interviewees noted, Progress toward RPMP objectives is inconsistent. Success stories, such as improvements in wilding conifer control, demonstrate the potential impact of well-funded and coordinated efforts. However, issues like rabbit infestations remain pervasive, with limited progress due to fragmented efforts and insufficient resources. Interviewees intimated that some view the RPMP as inadequate for addressing broader biosecurity outcomes.</p> <p>Interviewees describe progress as uneven. Even though advancements have been made in areas like wallaby and wilding conifer management due to targeted funding, rabbit control efforts, particularly in rural and lifestyle areas, continue to struggle. It was noted that some RPMP objectives might not be realistic, given current resourcing.</p>	<p>Interviewees noted, the RPMP's impact has been limited for private sector stakeholders. While the plan has provided a framework for some site-led initiatives, it has not resulted in significant progress toward comprehensive pest management outcomes. The lack of enforcement and proactive planning reduces its effectiveness in achieving long-term goals.</p>	<p>Interviewees noted the RPMP has achieved localised successes, such as the reduction of possum populations on the Otago Peninsula. However, broader impacts are limited by enforcement gaps, funding constraints, and fragmented community engagement. For example, site-led projects have shown potential but are hindered by unclear responsibilities and insufficient ORC support.</p> <p>Interviewees indicated that progress varies significantly by pest type and region. The elimination of possums on the Otago Peninsula is a standout success. Conversely, rabbit management efforts in Central Otago highlight systemic inefficiencies, with individual landowners often working in isolation due to a lack of coordinated support.</p>	<p>Iwi noted the RPMP has achieved mixed results. While eradication efforts for species like rooks have been successful, challenges persist in areas such as rabbit pest management. Iwi note that existing programmes often lack sustainability and resource utilisation, which could enhance outcomes and economic benefits</p> <p>Progress has been uneven. Successes, such as mustelid and possum control through Predator Free programmes, are contrasted by ongoing challenges with rabbits.</p>
Is the right investment strategy chosen to deliver an effective programme?	<p>Broadly, interviewees described investment as inadequate and fragmented. National funding has enabled some successes, the RPMP's reliance on regional budgets has limited the capacity to address key pests effectively.</p>	<p>No comment</p>	<p>Interviewees described the investment strategy as reactive with limited targeting. Stakeholders call for a shift to a more proactive approach, including:</p> <ul style="list-style-type: none"> <li>Funding catchment-level initiatives to address pest control holistically.</li> <li>Supporting biosecurity measures on conservation lands to prevent pest proliferation.</li> <li>Introducing sustainable funding mechanisms that share costs across stakeholders</li> </ul>	<p>The current investment strategy is reactive and fragmented. Interviewees consistently recommend a shift to proactive, catchment-level planning with long-term funding commitments. For example, OSPRI's structured funding and monitoring approach is cited as a model for broader adoption. The lack of resources for ongoing pest monitoring and professional staffing further limits the RPMP's effectiveness. Some interviewees suggest reallocating funds from administrative overheads to frontline activities like education, enforcement, and coordination</p>	<p>Iwi view the current investment strategy as opaque and insufficiently inclusive. There is a need to allocate funding for initiatives that reflect Māori values and priorities, such as customary harvesting and cultural site preservation.</p>
What are the next steps for the RPMP?	<p>Interviewees recommended the following priority actions:</p> <ul style="list-style-type: none"> <li><b>Strengthen monitoring and enforcement:</b> Allocate resources to establish baselines, track pest</li> </ul>	<p>Interviewees recommended the following priority actions:</p> <ul style="list-style-type: none"> <li><b>Increase funding and capacity:</b> Secure additional funding to build capacity,, invest in advanced tools, and support long-term pest management objectives.</li> </ul>	<p>Interviewees recommended the following priority actions:</p> <ul style="list-style-type: none"> <li><b>Revise pest lists:</b> For the next iteration of the RPMP, include critical species like possums (not only as side-led pest as in the present</li> </ul>	<p>Interviewees recommended the following priority actions:</p> <ul style="list-style-type: none"> <li><b>Strengthen enforcement:</b> Revise RPMP wording to empower ORC to enforce compliance more effectively.</li> </ul>	<p>Based on Iwi feedback, the following steps are recommended:</p> <ul style="list-style-type: none"> <li><b>Enhance accessibility:</b> Simplify the RPMP document and make it searchable for specific pest information.</li> </ul>

	Public Sector	Public Sector ORC	Private Sector	NGO	Iwi
	<p>prevalence, and enforce compliance, particularly for site-led initiatives</p> <ul style="list-style-type: none"> <li>• <b>Improve collaboration:</b> Formalise partnerships with neighbouring councils, government agencies, and community groups to enhance cross-boundary pest management</li> <li>• <b>Expand pest coverage:</b> Address emerging pests (future iteration of RPMP), such as feral deer and goats, through more dynamic and adaptable planning processes</li> <li>• <b>Enhance Community Engagement:</b> Increase education efforts to raise awareness and clarify landowner responsibilities.</li> <li>• <b>Revise the investment strategy:</b> Secure dedicated funding for long-term pest management, particularly for species with high ecological and economic impacts</li> </ul>	<p><b>Focus on realistic objectives:</b> Revise the RPMP (future iteration) to ensure that rules and objectives are achievable within available resources.</p> <p><b>Enhance collaboration:</b> Strengthen cross-boundary initiatives and establish advisory boards to incorporate external expertise.</p> <p><b>Expand public education:</b> Increase outreach efforts to inform landowners of their responsibilities and promote proactive pest management</p> <p><b>Leverage technology:</b> Adopt tools like drones and AI for monitoring and surveillance to improve efficiency and data accuracy.</p>	<p>RPMP) to align with biodiversity and disease control objectives.</p> <ul style="list-style-type: none"> <li>• <b>Strengthen enforcement:</b> Assure rules are followed with enforceable obligations, to ensure compliance across landowners.</li> <li>• <b>Enhance collaboration:</b> Partner with organisations like OSPRI and leverage their successful models to improve coordination and efficiency.</li> <li>• <b>Increase funding and resources:</b> Develop a long-term funding strategy to support sustained pest management efforts, especially in areas with high ecological value.</li> <li>• <b>Improve communication:</b> Use targeted outreach to educate stakeholders about the RPMP and foster public engagement in pest control.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Enhance community engagement:</b> Develop accessible education programmes and resources to raise public awareness about pest obligations and management strategies</li> <li>• <b>Adopt catchment-level approaches:</b> Coordinate pest management across natural boundaries rather than administrative ones</li> <li>• <b>Increase funding and staffing:</b> Secure sustained funding for long-term monitoring and professionalise volunteer support.</li> <li>• <b>Integrate Mātauranga Māori:</b> Strengthen partnerships with mana whenua to ensure cultural and ecological values are central to future pest management plans</li> <li>• <b>Leverage technology:</b> Expand the use of tools like GIS mapping and AI-enabled monitoring systems for cost-effective pest tracking and control</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Integrate Māori perspectives:</b> Incorporate Mātauranga Māori and emphasize cultural values like Mahika Kai in pest management goals.</li> <li>• <b>Improve resource transparency:</b> Clearly communicate how budgets are allocated, including funding for Māori businesses and contractors.</li> <li>• <b>Expand marine pest focus:</b> In the next RPMP iteration, address gaps in marine pest management and align Otago’s strategy with neighbouring regions.</li> <li>• <b>Foster collaboration:</b> Strengthen partnerships with iwi, trusts, and other community stakeholders through regular hui and working groups.</li> <li>• <b>Explore sustainable resource use:</b> Investigate opportunities for utilising pest byproducts to create economic value while achieving pest management goals as a tool to support pest management in the public.</li> </ul>

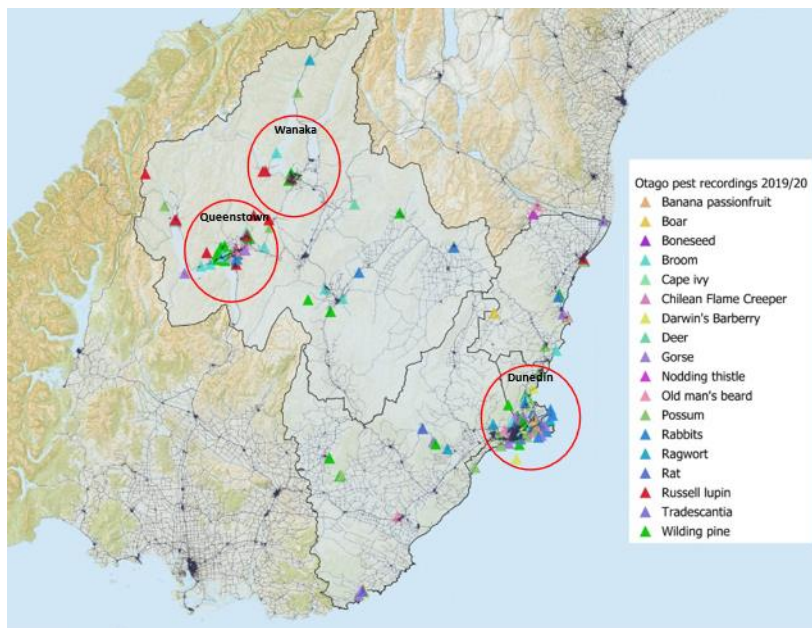
## Appendix E Spatial distribution of pest observations

We provide here an overview of the spatial distribution of pest recordings in the Otago region and a detailed snapshot of pest recordings in the Otago Peninsula across the RPMP implementation years. This data is informed from iNaturalist. In summary, pest observations are clustered around more populated areas such as Queenstown, Wanaka, or Dunedin.

### Otago region

Figure 28 shows the spatial distribution of pest recordings during the first year of the RPMP implementation. Three clusters with a high concentration of pest recordings were evident around the main cities: Queenstown, Wanaka, and Dunedin. In Queenstown, wilding pines, broom, and Russell lupin were frequently reported. In the Wanaka area, there were a smaller number of recordings, primarily of wilding pines and Russell lupin. Dunedin recorded the highest concentration of pest activity with significant reports of rabbits, possums, and gorse. We note that those reporting clusters are likely a function of population.

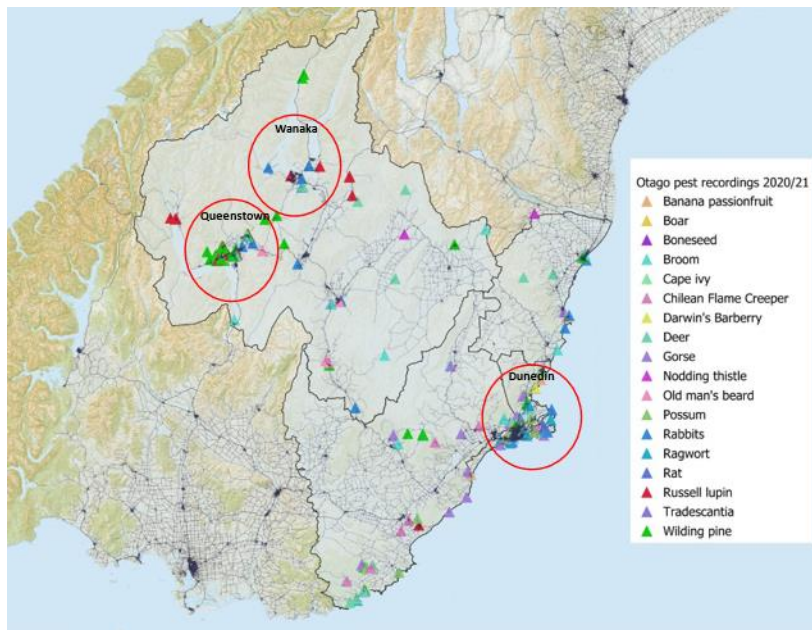
Figure 28: Spatial distribution of pest recordings in Otago region 2019/20



Source: Sapere calculations using iNaturalist data

In 2020/21 (Figure 29), the distribution and types of pest recordings around the main cities remained largely consistent with the previous year. However, there was an increase in rabbits reported in the Wanaka area and a decline in broom reporting around Queenstown.

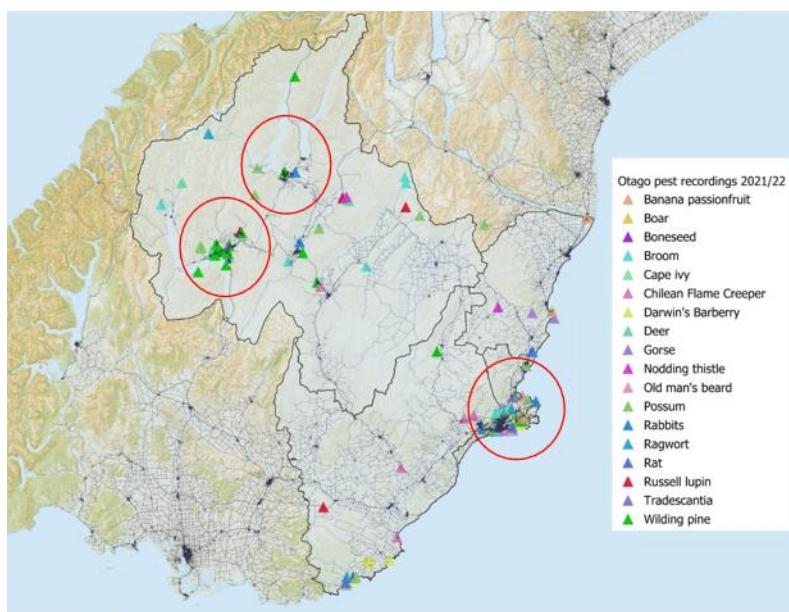
Figure 29: Spatial distribution of pest recordings in Otago region 2020/21



Source: Sapere calculations using iNaturalist data

In 2021/22 (Figure 30), pest recordings were largely consistent with the previous year, though there was a noticeable decrease in recordings around Wanaka.

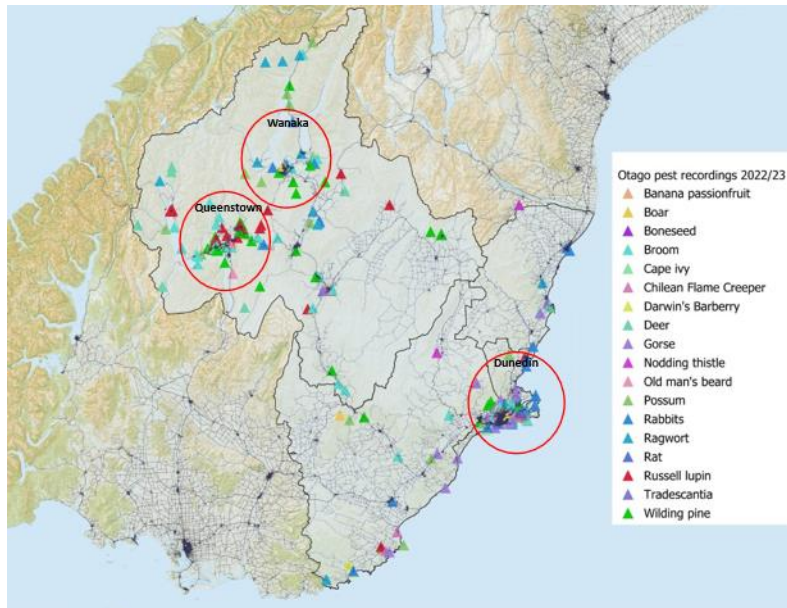
Figure 30: Spatial distribution of pest recordings in Otago region 2021/22



Source: Sapere calculations using iNaturalist data

In 2022/23 (Figure 31), pest recordings increased significantly in Queenstown and Wanaka, while the distribution of pest types remained similar. Notably, there was a high frequency of wilding pine reports around Wanaka.

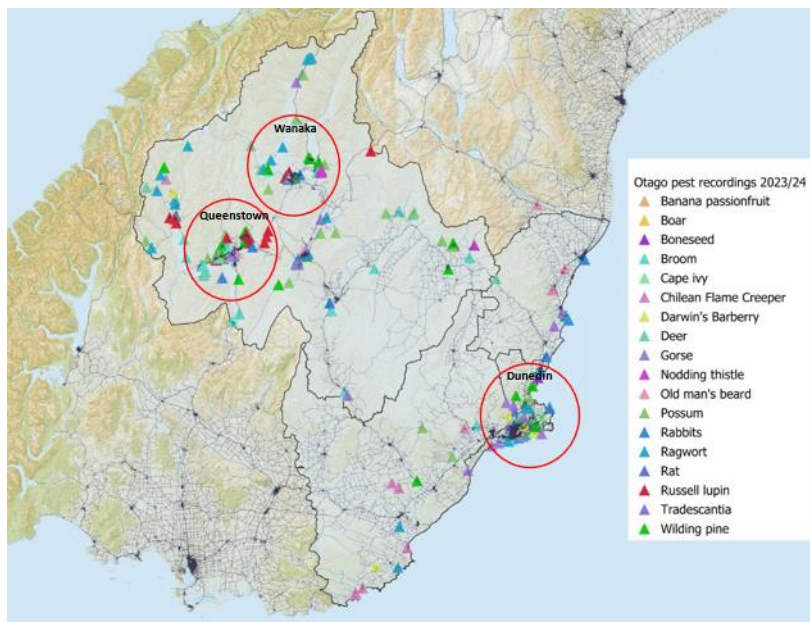
Figure 31: Spatial distribution of pest recordings in Otago region 2022/23



Source: Sapere calculations using iNaturalist data

In 2023/24 (Figure 32), pest recordings continued to increase across the main cities and throughout the wider Otago region.

Figure 32: Spatial distribution of pest recordings in Otago region 2023/24

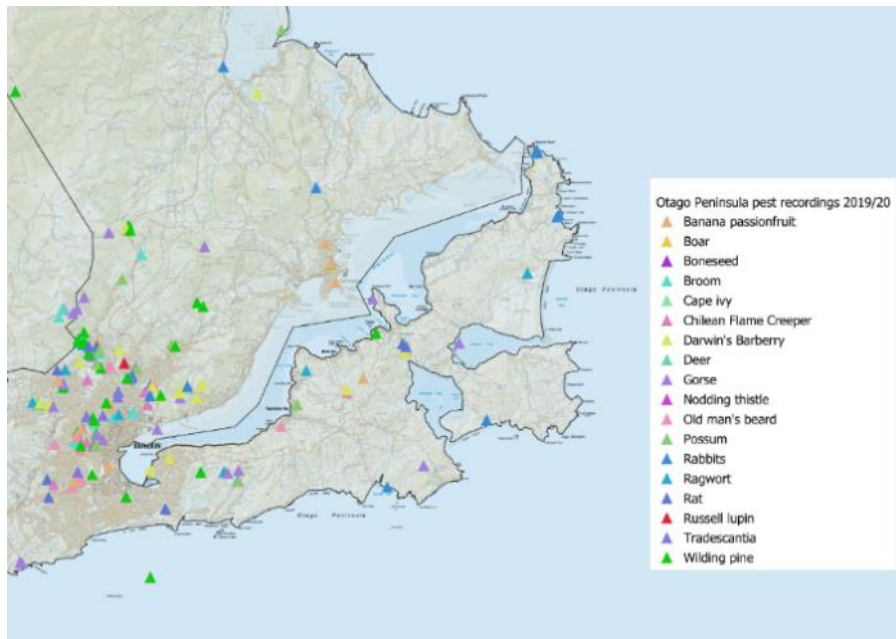


Source: Sapere calculations using iNaturalist data

### Otago: Site-led programmes at Otago Peninsula, West Harbour – Mt Cargill, Goat/Quarantine Island

Figure 33 shows the spatial distribution of pest recordings in the Dunedin City Centre, the Otago Peninsula, West Harbour/Mount Cargill, and Goat/Quarantine Island during the first year of the RPMP implementation. The most frequently reported pests were boneseed, broom, Darwin’s barberry, rats and wilding pines. We note that no recordings are observed for Goat/Quarantine Island, at all years of our analysis (see following figures).

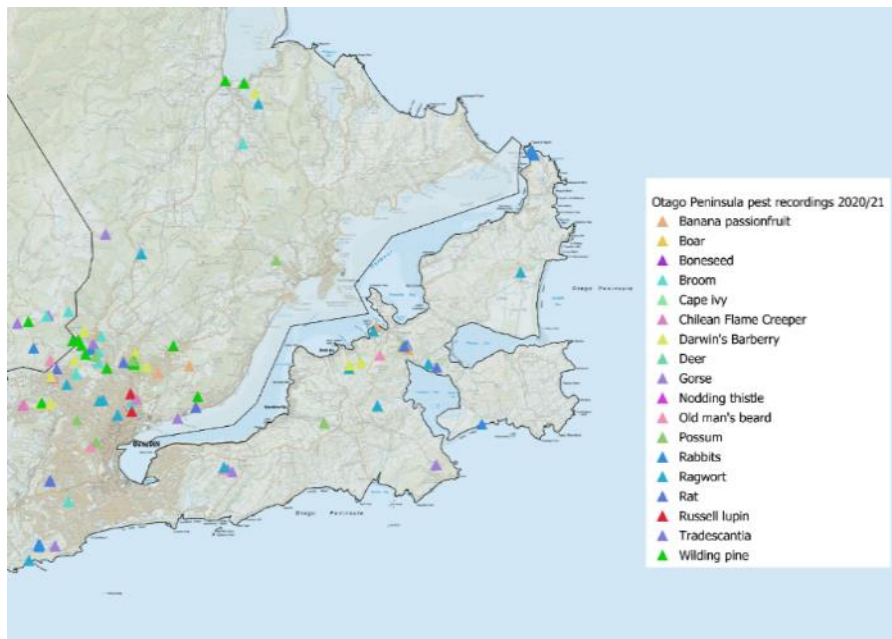
Figure 33: Spatial distribution of pest recordings in Otago Peninsula, West Harbour/Mt Cargill, Goat / Quarantine Island 2019/20



Source: Sapere calculations using iNaturalist data

In 2020/21 (Figure 34), there was a slight decrease in the number of pests reported compared to the previous year, with the most reported pest types remaining unchanged.

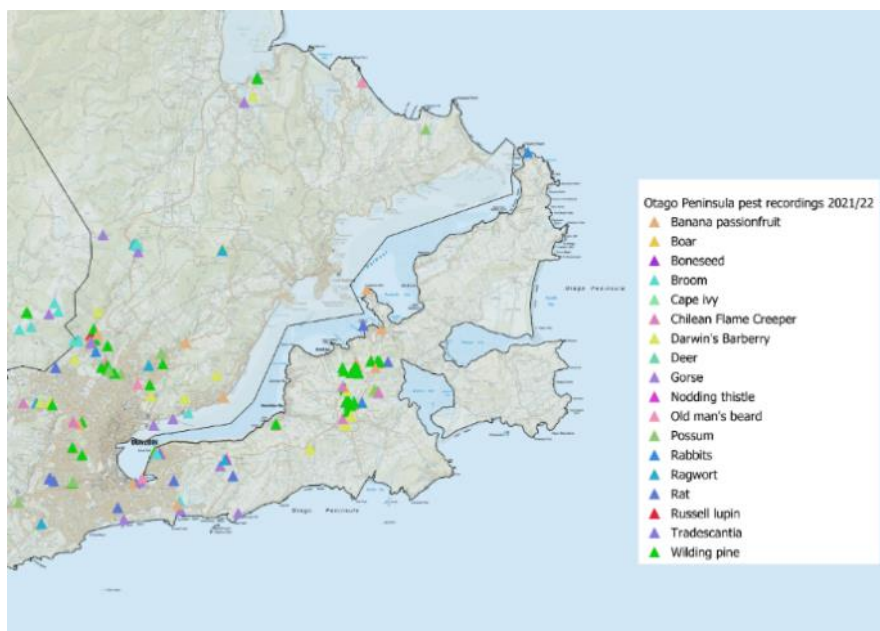
Figure 34: Spatial distribution of pest recordings in Otago Peninsula, West Harbour/Mt Cargill, Goat / Quarantine Island 2020/21



Source: Sapere calculations using iNaturalist data

In 2021/22 (Figure 35), pest recordings increased moderately. Most notably, there were significantly more reports of wilding pines which can reflect increased public awareness. Attribution to the RPMP is difficult due to the national programme operating in Otago.

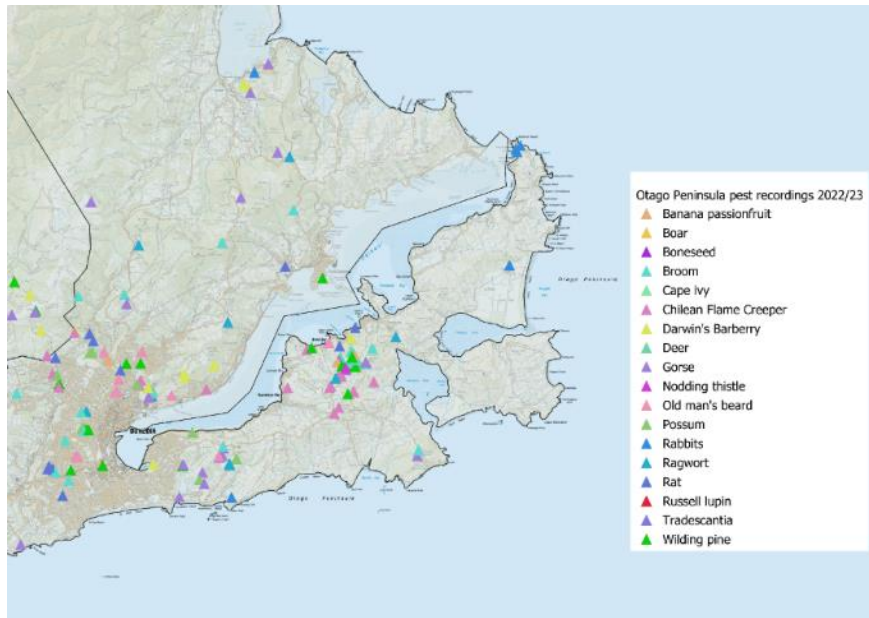
Figure 35: Spatial distribution of pest recordings in Otago Peninsula, West Harbour/Mt Cargill, Goat / Quarantine Island 2021/22



Source: Sapere calculations using iNaturalist data

In 2022/23 (Figure 36), the total number of pest recordings remained relatively stable. However, there was a decline in reports of wilding pines and a significant increase in reports of Chilean flame creeper and old man’s beard.

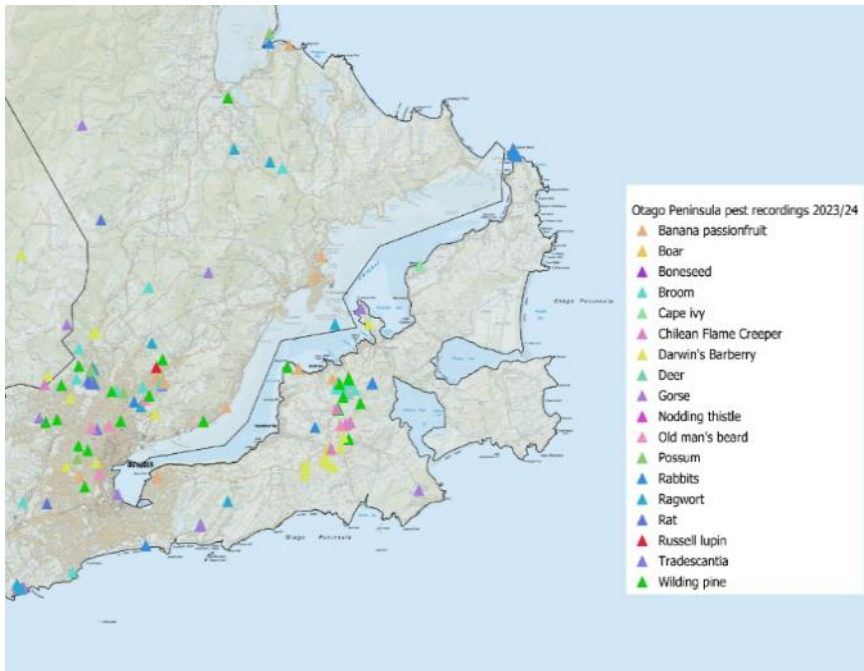
Figure 36: Spatial distribution of pest recordings in Otago Peninsula, West Harbour/Mt Cargill, Goat / Quarantine Island 2022/23



Source: Sapere calculations using iNaturalist data

In 2023/24 (Figure 37), the total number of pest recordings remained like the previous year, although there was a significant increase in reports of Darwin’s barberry.

Figure 37: Spatial distribution of pest recordings in Otago Peninsula, West Harbour/Mt Cargill, Goat / Quarantine Island 2023/24



Source: Sapere calculations using iNaturalist data

## Appendix F Key partners of ORC

*From Biosecurity Strategy 2019*

### **Ministry for Primary Industries**

The Ministry for Primary Industries (MPI) is the Government department charged with leadership of New Zealand's biosecurity system. MPI has the lead role in administering the Biosecurity Act and undertaking pest and disease surveillance. MPI's responsibilities include preventing the introduction and spread of new species to New Zealand. Key MPI policies/plans include The National Policy Direction for Pest Management 2015, the Biosecurity 2025 Direction Statement and the Pest Management National Plan of Action 2010. MPI lead national and sub-national responses to biosecurity incursions.

### **The Department of Conservation**

The Department of Conservation (DOC) is funded and empowered to manage pests and harmful organisms on public conservation land and is the principal central government agency involved in the conservation of biodiversity. DOC's role is broad and multifaceted, operating under the Conservation Act 1987, the National Parks Act 1980, the Wildlife Act 1953, the Wild Animal Control Act 1977, and the Reserves Act 1977.

DOC's statutory responsibilities include managing public conservation land, freshwater fisheries (including pest freshwater fish under the Freshwater Fisheries Regulations 1983), and the control of wild deer, chamois, thar, goats and pigs under the Wild Animal Control Act 1977. DOC is also required to control pests on land that they occupy or administer in accordance with any good neighbour rules in the RPMP.

### **The New Zealand Transport Agency**

The Transport Agency is a statutory entity and a Crown agent under Section 7 and Schedule 1 of the Crown Entities Act 2004 and therefore a Crown entity. As a Crown entity, the Transport Agency is subject to provisions applicable to land occupiers for the purposes of obligations for pest control on road reserves or verges.

### **Territorial authorities**

Otago is made up of five territorial authorities: Dunedin City Council, Clutha, Central Otago, Queenstown Lakes and Waitaki District Councils. Waitaki District straddles both the Otago and Canterbury regions.

Each territorial authority manages council reserves and undertakes direct management of harmful organisms impacting on reserves and other council administered land, within that territory. Territorial authorities are also road controlling authorities in their district. They are required to control pests on land that they occupy or administer in accordance with the RPMP rules.

## **KiwiRail**

KiwiRail is the Crown agent responsible for managing New Zealand's railway infrastructure. KiwiRail is required to control pests on land that they occupy or administer in accordance with the RPMP rules.

## **Land Information New Zealand**

Land Information New Zealand (LINZ) manages over 5,000 properties across New Zealand, totalling almost two million hectares and 8 per cent of New Zealand's land area. These include high country pastoral leases, Crown forest licensed land, former railway properties and the beds of many lakes and rivers. LINZ is responsible for biosecurity on land under its management and works collaboratively with other parties in undertaking its pest control programmes. This includes controlling pests in accordance with any good neighbour rules set out in the RPMP.

## **Predator Free 2050**

Predator Free 2050, led nationally by the Predator Free New Zealand Trust, has a goal to rid New Zealand of the most damaging introduced predators that threaten our natural taonga, our economy and primary sector. Ridding New Zealand of possums, rats and stoats by 2050 is a nationwide goal, with new techniques and a coordinated effort across communities, iwi, and public and private sectors.

At a local level, predator control initiatives are underway across Otago. This varies from smaller scale projects to large landscape scale initiatives in different areas across the region.

Predator Free Dunedin is a collaboration of 20 stakeholders working together to implement predator free objectives across large landscape scale projects on Otago Peninsula, West Harbour/Mount Cargill and the Dunedin urban area. The RPMP and this strategy supports the delivery of these predator free objectives and seek to support smaller scale and other landscape scale projects too.

## **Groups, industries, and individuals**

Everyone has responsibilities for pest management. At the individual level, people manage their land to keep it free of weeds and pests, particularly where this benefits them. Everyone is bound by the requirements in the Biosecurity Act for unwanted organisms and private land occupiers are required to control pests in accordance with the RPMP rules. There are many groups and non-governmental organisations in Otago that also play a key role in biosecurity management by undertaking voluntary management as part of biodiversity projects and site led initiatives.

At an industry level, industries such as OSPRI and Kiwifruit Vine Health have prepared and are implementing national pest management plans under the Biosecurity Act. Other examples include the Plant Nurseries Association involvement in the National Pest Plant Accord, and Port Otago's involvement in marine pest surveillance and management.

## About Sapere

Sapere is one of the largest expert consulting firms in Australasia, and a leader in the provision of independent economic, forensic accounting and public policy services. We provide independent expert testimony, strategic advisory services, data analytics and other advice to Australasia’s private sector corporate clients, major law firms, government agencies, and regulatory bodies.

‘Sapere’ comes from Latin (to be wise) and the phrase ‘sapere aude’ (dare to be wise). The phrase is associated with German philosopher Immanuel Kant, who promoted the use of reason as a tool of thought; an approach that underpins all Sapere’s practice groups.

We build and maintain effective relationships as demonstrated by the volume of repeat work. Many of our experts have held leadership and senior management positions and are experienced in navigating complex relationships in government, industry, and academic settings.

We adopt a collaborative approach to our work and routinely partner with specialist firms in other fields, such as social research, IT design and architecture, and survey design. This enables us to deliver a comprehensive product and to ensure value for money.

### For more information, please contact:

Dr Julius Ohrnberger

Mobile: +64 28 470 1970

Email: [johrnberger@thinkSapere.com](mailto:johrnberger@thinkSapere.com)

<b>Wellington</b>	<b>Auckland</b>	<b>Sydney</b>	<b>Melbourne</b>	<b>Canberra</b>	<b>Perth</b>
Level 9	Level 8	Level 18	Level 5	GPO Box 252	PO Box 1210
1 Willeston Street	203 Queen Street	135 King Street	171 Collins Street	Canberra City	Booragoon
PO Box 587	PO Box 2475	Sydney	Melbourne	ACT 2601	WA 6954
Wellington 6140	Shortland Street	NSW 2000	VIC 3000		
	Auckland 1140				
P +64 4 915 7590	P +64 9 909 5810	P +61 2 9234 0200	P +61 3 9005 1454	P +61 2 6100 6363	P +61 8 6186 1410

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