

---

# OPERATIONAL PLAN REPORT 2020/21

© Photograph by Chris Gee

**REGIONAL PEST MANAGEMENT  
PLAN 2019-2039**



## Contents

<b>1.</b>	<b>Introduction</b>	<b>1</b>
1.1	Background	1
1.2	Purpose of this Operational Plan Report	1
<b>2.</b>	<b>Pest Animals</b>	<b>2</b>
2.1	Programme results	2
2.1.1	Wallaby ( <i>Macropus rufogriseus</i> , <i>Macropus eugenii</i> )	2
2.1.2	Rook ( <i>Corvus frugilegus</i> )	3
2.1.3	Feral rabbit ( <i>Oryctolagus cuniculus</i> )	5
2.1.4	Wasps (common wasp – <i>Vespula vulgaris</i> , German wasp – <i>V. germanica</i> , Australian paper wasp – <i>Polistes humilis</i> , Asian paper wasp – <i>P.chinensis</i> )	5
2.1.5	European hedgehog ( <i>Erinaceus europaeus occidentalis</i> )	6
2.1.6	Feral deer (fallow deer – <i>Dama dama</i> , Red deer – <i>Cervus elaphus</i> , Sika – <i>C. nippon.</i> )	7
2.1.7	Feral goat ( <i>Capra hircus</i> )	9
2.1.8	Magpie ( <i>Gymnorhina tibicen tibicen</i> , <i>G. tibicen hypoleuca</i> )	10
2.1.9	Mustelids (ferrets – <i>Mustela furo</i> , stoats – <i>M. erminea</i> , weasels – <i>M. nivalis</i> )	10
2.1.10	Pest cat ( <i>Felis catus</i> )	11
2.1.11	Possum ( <i>Trichosurus vulpecula</i> )	11
2.1.12	Regional Possum Predator Control Programme (RPPCP)	13
2.1.13	Rats ( <i>Rattus norvegicus</i> , <i>R. rattus</i> )	14
2.1.14	Advice, Education and Engagement	16
<b>3.</b>	<b>Pest Plants</b>	<b>19</b>
3.1	Programme results	19
3.1.1	Alligator weed ( <i>Alternanthera philoxeroides</i> ), Chilean needle grass ( <i>Nassella neesiana</i> ), Nassella tussock ( <i>Nassella trichotoma</i> )	20
3.1.2	Moth plant ( <i>Araujia hortorum</i> )	20
3.1.3	Senegal tea ( <i>Gymnocoronis spilanthoides</i> )	21
3.1.4	Spartina ( <i>Spartina anglica</i> , <i>S. alterniflora</i> )	23
3.1.5	Velvetleaf ( <i>Abutilon theophrasti</i> )	24
3.1.6	Woolly nightshade ( <i>Solanum mauritianum</i> )	25
3.1.7	Purple loosestrife ( <i>Lythrum salicaria</i> )	26
3.1.8	Wilding conifers – European larch ( <i>Larix decidua</i> ), Douglas fir ( <i>Pseudotsuga menziesii</i> ) and pine species ( <i>Pinus spp.</i> )	28
3.1.9	Blue passionflower ( <i>Passiflora caerulea</i> )	28
3.1.10	Boneseed ( <i>Chrysanthemoides monilifera</i> )	29
3.1.11	Climbing spindleberry ( <i>Celastrus orbiculatus</i> )	30
3.1.12	Eelgrass ( <i>Vallisneria spiralis</i> , <i>V. gigantea</i> )	31
3.1.13	Banana passionfruit ( <i>Passiflora mixta</i> , <i>P. mollissima</i> , <i>P. tripartita</i> ), Cathedral bells ( <i>Cobaea scandens</i> ), Old man’s beard ( <i>Clematis vitalba</i> )	32
3.1.14	Key Native Ecosystems, Reserves and Forest Health (Pest Plants)	32
3.1.15	Biocontrol	33
3.1.16	Surveillance and Engagement	35

<b>4. Actual costs</b>	<b>40</b>
<b>Appendices:</b>	<b>41</b>
<b>Appendix 1 – Biocontrol agents released in the Wellington region</b>	<b>41</b>
<b>Appendix 2: Modified McLean Scale</b>	<b>43</b>

# **1. Introduction**

## **1.1 Background**

Greater Wellington Regional Council (GW) biosecurity activities involve the control of unwanted plants and animals for environmental, economic, social and cultural reasons:

- **Environmental**

Many of New Zealand's native plants and animals cannot co-exist with introduced species. In areas of high biodiversity value, pest plants and pest animals need to be controlled to protect vulnerable ecosystems.

- **Economic**

The impact of pest plants and pest animals leads to considerable economic loss in many of New Zealand's primary industries. Pest management is essential to the success of industries such as agriculture.

- **Social**

Pest organisms create a range of social problems within our communities. Pest plants and pest animals cause a considerable nuisance in many aspects of rural and urban life, inhibiting the ability of people to enjoy their property, lifestyle and wellbeing.

- **Cultural**

Activities carried out under the Greater Wellington Regional Pest Management Plan 2019-2039 (the RPMP) provide for the protection of the relationship between Maori and their ancestral lands, waters, sites, wahi tapu and taonga, and the protection of those aspects from the adverse effects of pests.

The RPMP was prepared in accordance with the Biosecurity Act 1993 and became operative on 2 July 2019.

## **1.2 Purpose of this Operational Plan Report**

This document reports against the achievements and outcomes of GW's biosecurity related activities. The work programme was set by the RPMP Operational Plan 2020/21 and aligns with the GW Annual Plan, which sets overall priorities and work programmes for the organisation.

Implementation of the RPMP requires resources. Our obligation to the community is to ensure these resources are used as efficiently and effectively as possible. This report provides some detail regarding how and where those resources were applied in the 2020/21 year.

The report is structured in two parts and should be read in conjunction with the RPMP Operational Plan 2020/21:

Part One - Pest Animals

Part Two - Pest Plants

## 2. Pest Animals

### 2.1 Programme results

Across the Wellington region, a significant amount of work went into pest animal control, by GW staff, Predator Free Wellington staff, and by numerous dedicated volunteers who put in many hours over the year, for which we are very grateful.

The following report takes data from a number of sources; including input from a mobile app which allows us to record information on the spot, and which gets automatically loaded onto our mapping systems for analysis, and data from the website [Trap.NZ](http://Trap.NZ) which many volunteer groups also record data on. The data covers everything from Territorial Local Authority (TLA) reserves sites we have worked on to Key Native Ecosystem (KNE) and Wetland Programme sites, to Regional Parks, GW forestry areas, Predator Free Wellington areas and Pūkaha/Mt Bruce.

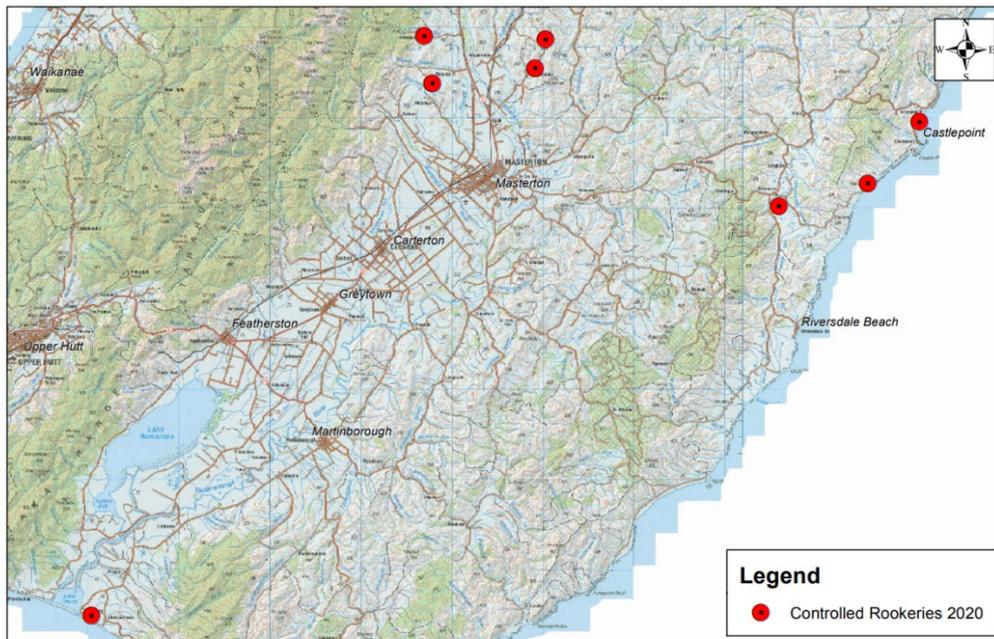
As an overall summary, our combined trapping and shooting efforts - including the work of volunteers and Predator Free Miramar - killed 525 mice, 3,432 rats, over 1,000 rabbits, 3,746 hedgehogs, 489 possums, 511 mustelids, 393 pest cats and 901 ungulates (deer, goats and pigs). Overall numbers of animals removed from the environment are much higher. We cannot give an estimate of how many pests are killed by the toxins used in our operations.

#### 2.1.1 Wallaby (*Macropus rufogriseus*, *Macropus eugenii*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>A joint investigation with the Ministry for Primary Industries (MPI) into a Facebook post about Bennett's wallaby supposedly sourced from the South Island, and being kept as a pet, resulted in the discovery of a pest kept illegally and without a permit in our region. The MPI officer issued a Notice of Direction (NOD) to the owner. Following the owners' appeal to issue an exemption of the rule under the RPMP we then issued a NOD which required the wallaby to be de-sexed and described the standards for it to be kept under. Once officers were assured that the NOD was complied with, a permit to keep the wallaby was issued to the owners. The owners were made aware that no more animals are to be obtained and that no more permits would be issued in the future.</p> <p>One of our team visited Rotorua to upskill on how Bay of Plenty Regional Council (BOPRC) conduct wallaby control and surveillance. The use of dogs is a key tool. In turn, BOPRC staff were impressed by the night vision gear and night shooting processes and procedures that we use.</p> <p><u><a href="#">2020/21 programme summary</a></u></p> <p>One Bennett's wallaby detected, now legally permitted to be held in captivity.</p>				

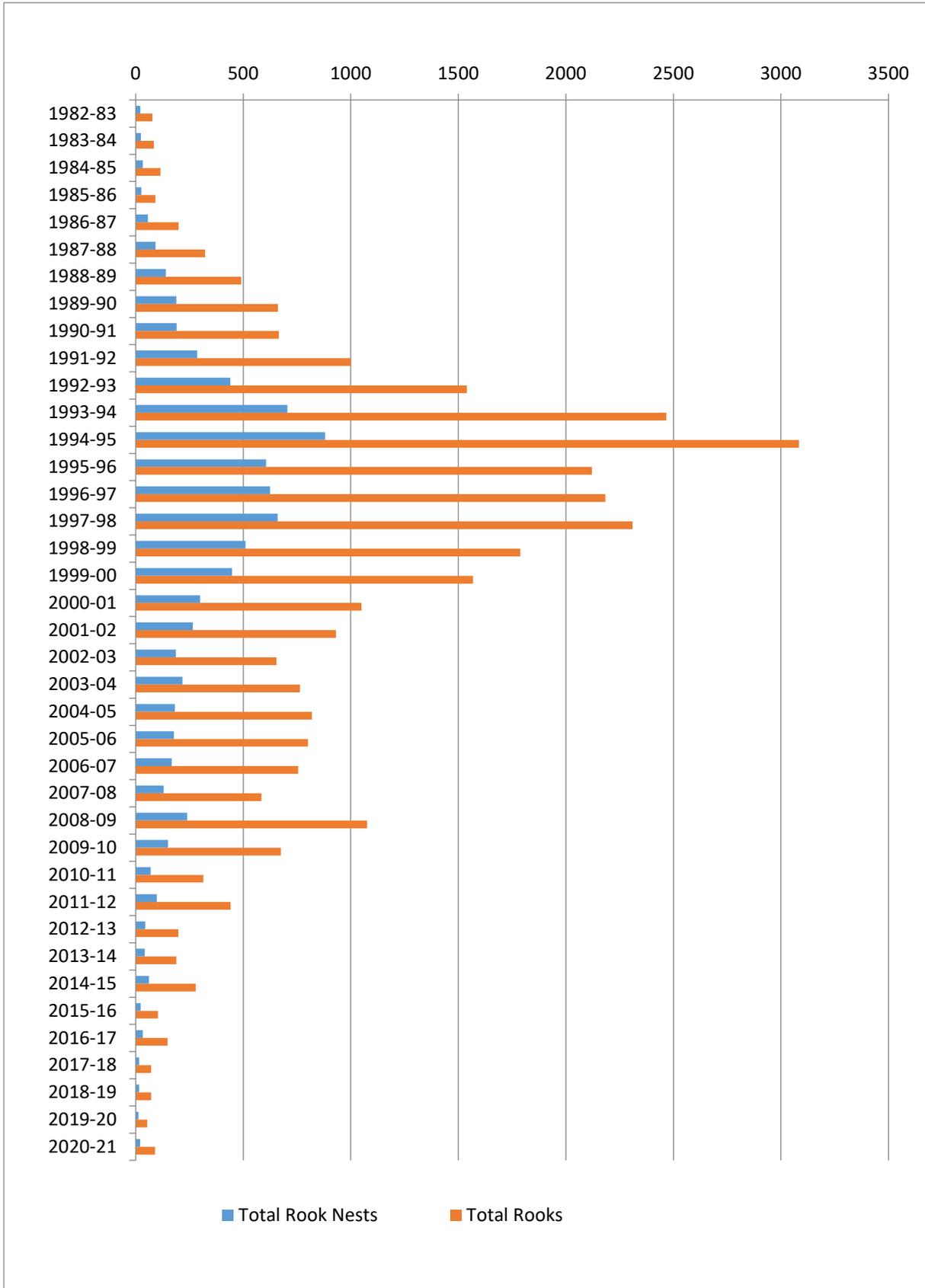
### 2.1.2 Rook (*Corvus frugilegus*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>Biosecurity staff surveyed 122 historic rookeries across the Wairarapa by helicopter and located 11 breeding rookeries where nesting was taking place - two of those rookeries were new. All were small in number, with some eggs and a single chick seen.</p> <p>In mid-October 2020, 20 active nests containing eggs or chicks were treated by placing gel bait directly into nests by hand application from a crewman suspended beneath a helicopter. A further 20 fresh but unused nests were also treated with the hope that rooks would enter them and make contact with the gel toxin. Poisoning nests targets females as they incubate the eggs.</p> <p>When we went back to bait the active nests, three sites were no longer active – therefore only the eight treated sites are recorded on Map 1 below.</p> <p>Rook nest numbers have plummeted in the last several years due to years of aerial control. In the mid 1990's we were recording almost 900 active nests during surveys. In contrast, we currently have no breeding rookeries in the Wellington/Kāpiti Coast area and very few nests in Wairarapa.</p> <p>Using the accepted industry method for estimating population size (see <a href="http://www.bionet.nz">www.bionet.nz</a> publication A6), it is possible the Wellington region has around 90 birds present, most of which would be male and will eventually die out without breeding.</p> <p><u>2020/21 programme summary</u></p> <p>A total of 11 rookeries recorded and 40 nests controlled, the same number of rookeries found as in the previous year, but with four less nests controlled (Graph 1).</p>				



Post Rook Control Map 2020

Map 1. Rookeries treated, October 2020



**Graph 1. Historical records of the numbers of rook nests and rookeries controlled**

### 2.1.3 Feral rabbit (*Oryctolagus cuniculus*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>The consistent issue over the year has been the extra workload imposed by high rabbit numbers in the region, which our staff deal with on top of their regular scheduled work. The extraordinary number of enquiries received are hard to respond to in a timely way with the level of staffing currently in place.</p> <p>Over the entire year we applied 10,587kg of pindone carrot bait to both public and private properties.</p> <p>For Hutt City Council (HCC) we shot 35 rabbits between Belmont Domain, Hikoikoi Reserve, Petone Beach and Riddiford Gardens, compared to 203 last year, showing the positive results of successful sustained control effort.</p> <p>Kāpiti Coast is the area of consistently high rabbit activity, we shot 643 rabbits at a number of sites for the Kapiti Coast District Council (KCDC).</p> <p>Night shooting also occurred along the Hutt River (over 40 shot) and in Wellington City Council (WCC) parks and reserves (over 300 rabbits shot).</p> <p>Staff innovate with new technology and techniques, perfecting the use of thermal imaging equipment to assist in night shooting work. Through experimentation we have selected particular bullets to reduce the risk of ricochets. Our quarterly control schedule seems optimal for suppressing rabbit populations to low levels yet avoiding having them become wary of the control method used.</p> <p>In spring when there are high numbers of baby rabbits and fresh grass growing, shooting and fumigation are more effective control methods than toxic baiting.</p> <p>During the year rabbit numbers were worst in Kāpiti and less of an issue in Wairarapa. Reports of dead rabbits in some areas of Wairarapa suggested that rabbit haemorrhagic disease is still be circulating.</p> <p>At Pūkaha/Mt Bruce our experienced staff are part of a working group planning large scale rabbit control including an aerial pindone operation and combined with follow-up shooting and fumigation work, for the 2021/22 year. This will control high rabbit numbers that are currently affecting properties in both GW and Horizons Regional Council's regions. This will make the area less attractive for ferrets, which still find their way into the sanctuary and kill kiwi from time to time.</p> <p><u>2020/21 programme summary</u></p> <p>A total of 745 rabbit related enquiries were received compared to 387 during 2019/20.</p>				

### 2.1.4 Wasps (common wasp – *Vespula vulgaris*, German wasp – *V. germanica*, Australian paper wasp – *Polistes humilis*, Asian paper wasp – *P. chinensis*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>During the year, the Environmental Protection Authority (EPA) approved the release of <i>Metoecus paradoxus</i> (the wasp-nest beetle) and <i>Volucella inanis</i> (a hoverfly), two biological control agents for the exotic wasps, <i>Vespula germanica</i> and <i>V. vulgaris</i>. The</p>				

agents would likely first be released in Tasman region beech forest, but eventually should spread and may help control both the common and German wasp in our region. We were actively involved in the national initiative that resulted in these agents being imported into New Zealand.

2020/21 programme summary

A total of 42 enquiries received, 11 of these were human health complaints, compared to 24 complaints in total the previous year.



**Image 1. Asian paper wasp nest**

2.1.5 European hedgehog (*Erinaceus europaeus occidentalis*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>Hedgehogs are one of the targets of our predator control in KNE sites.</p> <p>We have learnt that A24 traps are not very effective when targeting hedgehogs. At Baring Head/Ōrua-pouanui we refined our trapping network and with regular servicing at a high standard, achieved the lowest hedgehog monitoring results ever for this site, contributing to the protection of nesting dotterel and lizard species.</p> <p><u>2020/21 programme summary</u></p> <p>We trapped 2,888 hedgehogs over the year, between TLA sites, KNE's, GW Parks and forestry areas. In addition, our Bioworks team trapped 541 hedgehogs at Pūkaha/Mt Bruce.</p>				

Small mammal monitoring occurs twice a year at KNE sites. Table 1 below gives the results as percentages of all tracking tunnels in the monitoring area in which hedgehog prints were found in.

**Table 1. Hedgehog tracking rates**

Site	November 2020	February 2021
Wainuiomata Mainland Island	0%	0%
WMI non-treatment area	8%	3%
East Harbour Northern Forest Mainland Island	0%	0%
EHNH non-treatment area	0%	12%
Baring Head/Ōrua-pouanui	18%	15%

See the [May 2021 report](#), the small mammal monitoring programme, carried out by our Biodiversity department, and [other recent reports](#).



**Image 2. Double set traps at Baring Head/Ōrua-pouanui where hedgehogs have been a problem**

2.1.6 Feral deer (fallow deer – *Dama dama*, Red deer – *Cervus elaphus*, Sika – *C. nippon*.)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>Deer numbers in the region continue to increase with reports received from Whiteman’s Valley, Stokes Valley and Wainuiomata of deer sightings and damage in suburban gardens and local reserves.</p> <p>Pest Animals staff carried out night shooting for deer at selected HCC sites such as Taitā Cemetery and the Eastern Hutt Hills as part of the council’s requested deer control program.</p>				

This was very successful with 30 deer destroyed. Photo points have been set up to assess any vegetation improvement.

**Table 2. Summary of ungulate hunting effort over the year**

Location	Pigs	Deer	Goats	Total
Akatarawa	6	7	209	222
Baring Head/Ōrua-pouanui	0	0	38	38
Belmont Regional Park	0	20	0	20
East Harbour Regional Park	9	19	3	31
Hutt City Council	1	56	1	58
Hutt catchment	6	43	18	67
Kaitoke Regional Park	2	9	2	13
Keith George Memorial Park	0	0	10	10
Pākuratahi	3	4	160	167
Parangarahu Lakes	1	0	50	51
Wainuiomata-Ōrongorongo	31	30	100	161
Wainuiomata Mainland Island	49	4	5	58
Other	0	5	0	5
<b>Total</b>	<b>108</b>	<b>197</b>	<b>596</b>	<b>901</b>



**Image 3. GW Pest Animals staff out hunting**

2.1.7 Feral goat (*Capra hircus*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We hunted goats in water collection areas (such as Hutt catchment), KNE reserves and Regional Parks as well as TLA reserve areas (as agreed with local authorities). Hunting contractors cover the large forest blocks on a scheduled rotation, and our staff work in smaller areas.</p> <p>We are currently attempting to develop hotspot maps to display information around goat population densities, which will inform recreational hunters who can then assist us with high density areas.</p> <p>No direct monitoring of ungulate abundance is undertaken. Forest plot monitoring as part of our tier 2 State of the Environment reporting can be used as proxy for general forest health and condition (visit the Terrestrial Ecology webpage on our website, <a href="http://www.gw.govt.nz">www.gw.govt.nz</a> for more information).</p> <p><u>2020/21 programme summary</u></p> <p>596 goats were destroyed as part of the 2,240 hours of hunting time, in which other ungulate species were also shot.</p>				

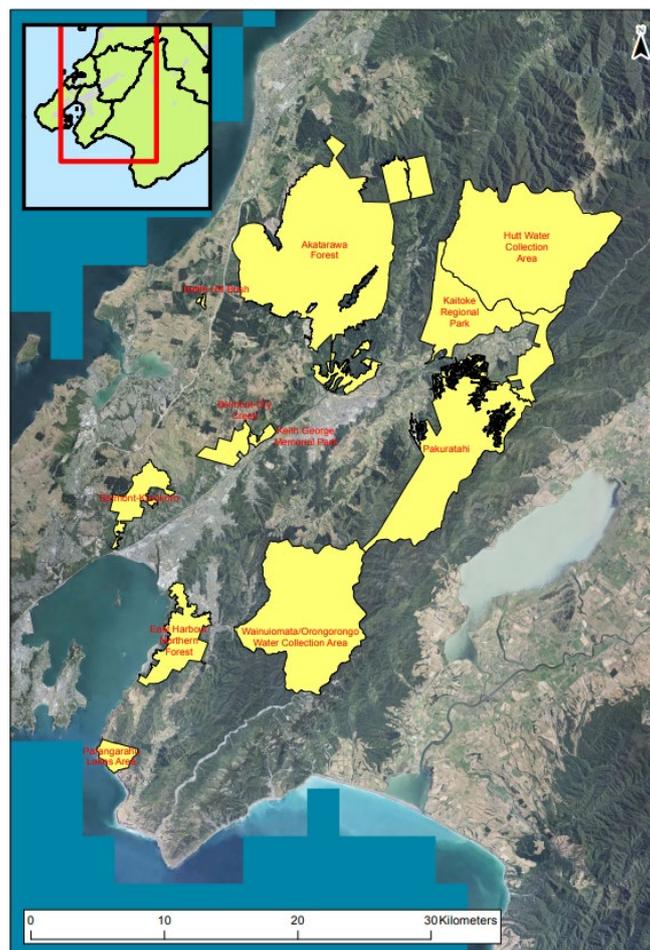


Image 4. GWRC KNE goat hunting areas in the Wellington region

### 2.1.8 Magpie (*Gymnorhina tibicen tibicen*, *G. tibicen hypoleuca*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>Magpie attacks resulted in numerous requests from Wairarapa, Porirua and Kāpiti for us to deal with the aggressive birds causing the issues. Posties, recreational cyclists and school grounds seemed to be the targets for magpie aggression this season.</p> <p>A mixture of firearms and trapping are used to control magpies in often very high risk areas and situations. We loaned out live capture traps to many of the affected people during the nesting season.</p> <p>At Queen Elizabeth Park alone, at least 13 magpies were trapped over the year.</p> <p><u>2020/21 programme summary</u></p> <p>142 magpie enquiries were received, 27 of these were about attacks, compared to 75 enquiries in total the previous year.</p>				

### 2.1.9 Mustelids (ferrets – *Mustela furo*, stoats – *M. erminea*, weasels – *M. nivalis*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>Regular maintenance of existing trap networks, such as those set up for predator control at Wairarapa Moana Wetlands and Boggy Pond, was carried out to schedule.</p> <p>In Wainuiomata Mainland Island mustelids are controlled using DOC200 and BT200 kill-traps spaced at 200 m intervals around the boundary and on lines through the interior that are approximately 1,000 m apart. All mustelid traps, bait stations and possum traps around the boundary are serviced at approximately five-week intervals.</p> <p>New trapping networks were installed at Tauanui, Hiwinui and Stoney Creek forests in the Wairarapa. For Hiwinui forest area, predator trap servicing training was given to predator control volunteers.</p> <p>Our AT220 (novel self-resetting traps) trial at Hiwinui was completed. Unfortunately, the trial has concluded that this type of trap in the current form and with current baits is not able to effectively control mustelids (or pest cats). The trial did provide some useful learnings through camera recordings of predator versus trap interactions. It was noted that there were more visits by cats to the trap sites this year compared to the last year which is likely due to the use of catnip as a lure. Also, tuna oil lure proved popular not only with cats but also possums, rats, and hedgehogs.</p> <p>We were involved with a group planning the installation of a trapping network for the Domain at Lake Wairarapa. Traps will be maintained by our team until the programme (and volunteer group) becomes established. We also provided support and advice on predator control around Wairarapa Moana and Waikanae catchment in association with the 'Jobs For Nature' initiatives.</p> <p><u>2020/21 programme summary</u></p> <p>We trapped 63 ferrets, 196 stoats and 225 weasels in KNE's this year. Our Bioworks team trapped 23 ferrets and 2 stoats at Pūkaha/Mt Bruce.</p> <p>Mustelid monitoring occurs twice a year at several KNE sites (Table 3)</p>				

Site	November 2020	February 2021
Wainuiomata Mainland Island	0%	4%
WMI non-treatment area	0%	3%
East Harbour Northern Forest Mainland Island	0%	0%
EHNF non-treatment area	0%	0%
Baring Head/Ōrua-pouanui	0%	8%



**Image 5. Stoat control at Baring Head/Ōrua-pouanui increases survival chances of dotterel chicks**

2.1.10 Pest cat (*Felis catus*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We have 927 targeted pest cat traps that are regularly serviced in KNE sites and in the course of our work again caught far more pest cats in the Wairarapa than any other areas.</p> <p><u>2020/21 programme summary</u></p> <p>We caught 251 pest cats at TLA sites, KNE's, GW parks and forestry areas. Our Bioworks team trapped 142 pest cats at Pūkaha/Mt Bruce.</p> <p>75 public enquiries about pest cats were responded to.</p>				

2.1.11 Possum (*Trichosurus vulpecula*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p><b>Wellington City Council reserves possum/predator control work</b></p>				

The success of possum control work is seen in the abundance of birdlife: kakariki were heard in Central Park (Brooklyn) and a bellbird was heard in Te Ahu Mairangi during bait station refilling. Kaka and karearea are now commonly heard in many reserve areas. Robins, saddlebacks and kakariki were all heard at Wrights Hill, and kakariki at Mākara Peak.

Heavy tawa fruit-fall affected some reserves, with large numbers of kereru seen. Volunteers reported a flock of 50 kereru in Trelissick Park, and a flock of 30 on the wing was also noted in Otari reserve.

We intensified the network at Mākara Peak with around 20 new bait stations.

#### Miramar Peninsula

Occasionally a possum makes its way into the peninsula, but these animals are quickly detected through intensive monitoring as well as notification from the public. Control measures are then put in place to ensure the area remains possum free.

#### Te Ahu Mairangi Hill

We have some issues around trap failures and thefts, but this project is a success, so it continues. Some bait was deployed in the last few services to address possum sign in the area. We have also added some predator control measures due to a pair of riflemen establishing themselves in the reserve. A community trapping initiative has been set up around this too.

#### Project Halo (Zealandia buffer)

This area is set as a trial for using trap network alone to suppress possum numbers and prevent reinvasion from adjacent properties not yet covered by possum control. Results are still unsatisfactory with pest numbers difficult to suppress by this method alone. The amount of non-target interference with traps (especially by pigs) and re-invasion of pests from neighbouring uncontrolled land are main issues. We plan to improve trap technology at the site and add novel self-resetting AT220 traps to boost possum control. We also plan more intensive monitoring to establish trends in target pest animal levels (excluding pigs and goats). High numbers of pigs and goats in the site makes monitoring difficult.

#### Southern landfill

This is a complex site with multiple zones requiring different toxins and traps. High possum re-invasion rates across some boundaries makes the job less cost-effective than is desirable, yet results are within an acceptable range. We hope for some improvement as some of those adjacent blocks of land are set up with possum control measures as they are absorbed into our Regional Possum Predator Control programme.

#### Te Kopahou

AT220 possum traps have started to be set up on the escarpment and are killing high numbers of possums. We will continue installing further traps in the area.

#### Brooklyn, Mt Albert and Mt Victoria

These areas generally have quite low numbers of possums, especially Mt Victoria. Most of this work will be taken over by the Predator Free Wellington project.

#### Mākara Peak

We added around 25 new bait stations to the bait station network over the last year. This will continue, and improvements to possum and rat control are expected. Relatively high re-invasion from possums occurs across some boundaries, but low numbers found at other boundaries indicate good mortality rates within the network.

Improvements are likely to increase the consistency of this and achieve better rat control.

**AT220 self-resetting, multi kill trap trial**

AT220 traps continue to be trialled at multiple sites to learn how to be best operate them and make use of their current abilities. Recent development improvements have made the trap more reliable, and we have set some up in areas with high possum numbers, as well as on traditional immigration routes.

At this stage we feel the traps remain unsuitable for areas of high public usage, or where children are likely to encounter them, and because they are large and highly visible, interference could be an issue. The addition of a night only function is a major safety improvement.

**Kāpiti Coast District Council possum control programme**

All controlled sites have remained at low possum numbers as a result of our long term control (Waikanae River Corridor, Raumatī Escarpment Reserve, Nikau Reserve and other Waikanae) reserves.

**Hutt City Council possum control programme**

A number of parks and reserves are under long term possum control (Western Hutt Hills, Wainuiomata Hill West and Parkway – Waiau wetland). All of the sites were serviced during the year and possum numbers remain low at these sites.

2020/21 programme summary

In KNE’s, TLA sites, GW parks and forestry areas through the region we trapped 489 possums during the year.

Possum monitoring is a part of the small mammal monitoring programme (the [May 2021 report](#) is available to read, as well [other recent reports](#)).

2.1.12 Regional Possum Predator Control Programme (RPPCP)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>In the 2020/21 year there were approximately 181,000 ha declared bovine Tuberculosis (Tb) free that are part of the RPPCP programme.</p> <p>The programme aims to maintain the benefits of long-term possum control achieved under the national pest management strategy for bovine Tb and to keep numbers of possums low (below 5% Residual Trap Catch ‘RTC’ index). The funding for the programme enables control to be carried over in part of the programme area each year.</p> <p>An aerial possum control operation in the Akatarawa forest using the biodegradable pesticide 1080 (sodium fluoroacetate) was successfully delivered on the 2<sup>nd</sup> of July 2021, after intensive planning and administration that took the entire 2020/21 financial year to work through.</p> <p><u>2020/21 programme summary</u></p> <p>122,000 ha of possum control and 4,300 ha of predator (mustelid) control were completed for the year. Two possum control operations were monitored, the weighted possum density average was 2.5%, well below the target (5% RTC).</p>				

2.1.13 Rats (*Rattus norvegicus*, *R. rattus*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>Rats are targeted in all KNE and TLA reserve programmes to mitigate their impact on native fauna and flora.</p> <p>Rat monitoring in WCC reserves in late February showed low tracking rates in all of the monitored reserves. At Mt Victoria the pellet bait (for possums and rats) was changed to wired blocks to solely target rats due to the lack of possums.</p> <p>At Te Ahumairangi Hill rat control is mainly via A24 automatic gas traps. Although not as cost-effective as brodifacoum the trapping grid is achieving adequate rat control whilst avoiding the use of a toxin. The site provides useful learnings about the effective use of self-resetting traps where we might be limited in our use of toxins.</p> <p><b>Double Tap® bait trial</b></p> <p>This novel toxin was trialled in Wainuiomata Mainland Island. Two applications of bait were applied in the adjacent non-treatment area over a six-month period, to determine efficacy against possums and rats in comparison to our current methods.</p> <p>Double Tap® contains both diphacinone and cholecalciferol, which we already use separately – the combination is lot more effective and faster acting than brodifacoum, and therefore considered more humane.</p> <p>Results to date have not shown any significant difference between using this product and our usual methods. Further trials will occur in 2021/22.</p> <p><b>Predator Free Miramar project</b></p> <p>This year the Predator Free Wellington – Miramar project saw an additional 3,700 devices installed across the Miramar Peninsula, adding to the 6,500 devices installed in 2019.</p> <p>The last trap capture of a mustelid was in January 2021, and no further mustelids have been detected across the Miramar Peninsula. The project was also successful in eradicating Norway rats from the area.</p> <p>Trap catch totals for the year for the Miramar Peninsula and Rongotai buffer area were: 883 ship rats, six Norway rats, two weasels and 317 hedgehogs. The number of kills from bait stations is not known.</p> <p>Devices were serviced regularly to ensure they were in good working order. Through these services staff were able to monitor rodent activity using multiple techniques. These ranged from bite marks on bait blocks, bait stations or traps, the feeding habits in bait stations, trail camera footage, chew cards, wax tags, and scat (droppings) to name a few.</p> <p>Where rat activity was detected, a response plan was formed and actioned. Generally additional devices were installed around the active areas to reduce the grid size of the device network.</p> <p>A number of tweaks were trialled with devices to increase the chances of interaction. One noticeable change was installing snap traps in trees. Staff found rats were interacting with chew cards stapled to trees but not with the bait station located below the tree. A few traps were placed in corflute tunnels in trees and rats started being caught. We think rats were moving through the bush canopy more than over the ground.</p>				

In areas of limited to no rat activity, we used motion activated trail cameras to provide certainty that there were no rats present. Areas were mapped out and cameras placed at approximately three per hectare.

During the year we carried on upskilling volunteers who are continuing the work in Miramar bush and coastal areas and helping finalise rat eradication on the peninsula.

2020/21 programme summary

We trapped 2,175 rats in KNE's, TLA sites, GW Parks and forestry areas. Bioworks trapped a further 368 rats at Pūkaha/Mt Bruce. PFW project accounted for 889 trapped rats.

Rat tracking occurs four times a year at a number of KNE sites. Table 4 below shows tracking tunnel results as percentages of the total number of tunnels in the monitoring area with rat prints present.

**Table 4. Rat tracking rates**

Site	August 2020	November 2020	February 2021	May 2021
Wainuiomata Mainland Island (5% target)	3%	1%	0%	18%
WMI non-treatment area	99%	88%	89%	85%
East Harbour Northern Forest Mainland Island (5% target)	10%	0%	0%	12%
EHNF non- treatment area	54%	46%	32%	34%
Baring Head/Ōrua- pouanui (10% target)	3%	0%	0%	0%
Queen Elizabeth Park (10% target)	0%	0%	0%	30%

The [May 2021 report](#) for the small mammal monitoring programme is available as are [other recent reports](#).



©Ian Robertson

**Image 6. Trap servicing and data collection, early morning at Wellington International Airport**

2.1.14 Advice, Education and Engagement

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p><b>Engagement</b></p> <p>Our Biosecurity pest animal webpages (on our website <a href="http://www.gw.govt.nz">www.gw.govt.nz</a>) were popular, and as with the previous year the most accessed pages were those for brodifacoum and pindone, reflecting that these are the most commonly used and sought-after toxins. Interest in trapping ties in with the desire to avoid toxins, and with Predator Free Wellington initiatives. Interest in 1080 relates to the highly publicised, and to some, controversial aerial 1080 operation in the Akatarawa forest.</p> <p><b>Events attended and education</b></p> <p>During the year staff were involved with Whangai Repo trainees in the Wairarapa, helping them form a trapping network plan for Lake Domain that DOC will help install with the trainees.</p> <p>Staff attended a Capital Kiwi meeting to give a presentation on rabbits, a Wainuiomata Catchment Health day with five schools, and Predator Free meetings in Waiwhetu and Upper Hutt.</p> <p><b>Species of Interest</b></p> <p><u>Argentine ant</u></p> <p>Control work at Queen Elizabeth Park and Kāpiti Boat Club was completed with less signs of Argentine ant activity than usual for the time of year (spring). Preventing Argentine ants reaching Kāpiti Island is important, as is supporting local residents in their coordinated Argentine ant control by carrying out baiting around the Queen Elizabeth Park wetland KNE. As part of the protection of Kāpiti Island, bait was supplied free from KCDC to boat operators permitted to take boats to Kāpiti Island.</p> <p><u>Mice</u></p> <p>Mice are listed on our Harmful Organism list in the RPMP, and it is worth noting that during the year both targeted mouse trapping (such as in Queen Elizabeth Park where</p>				

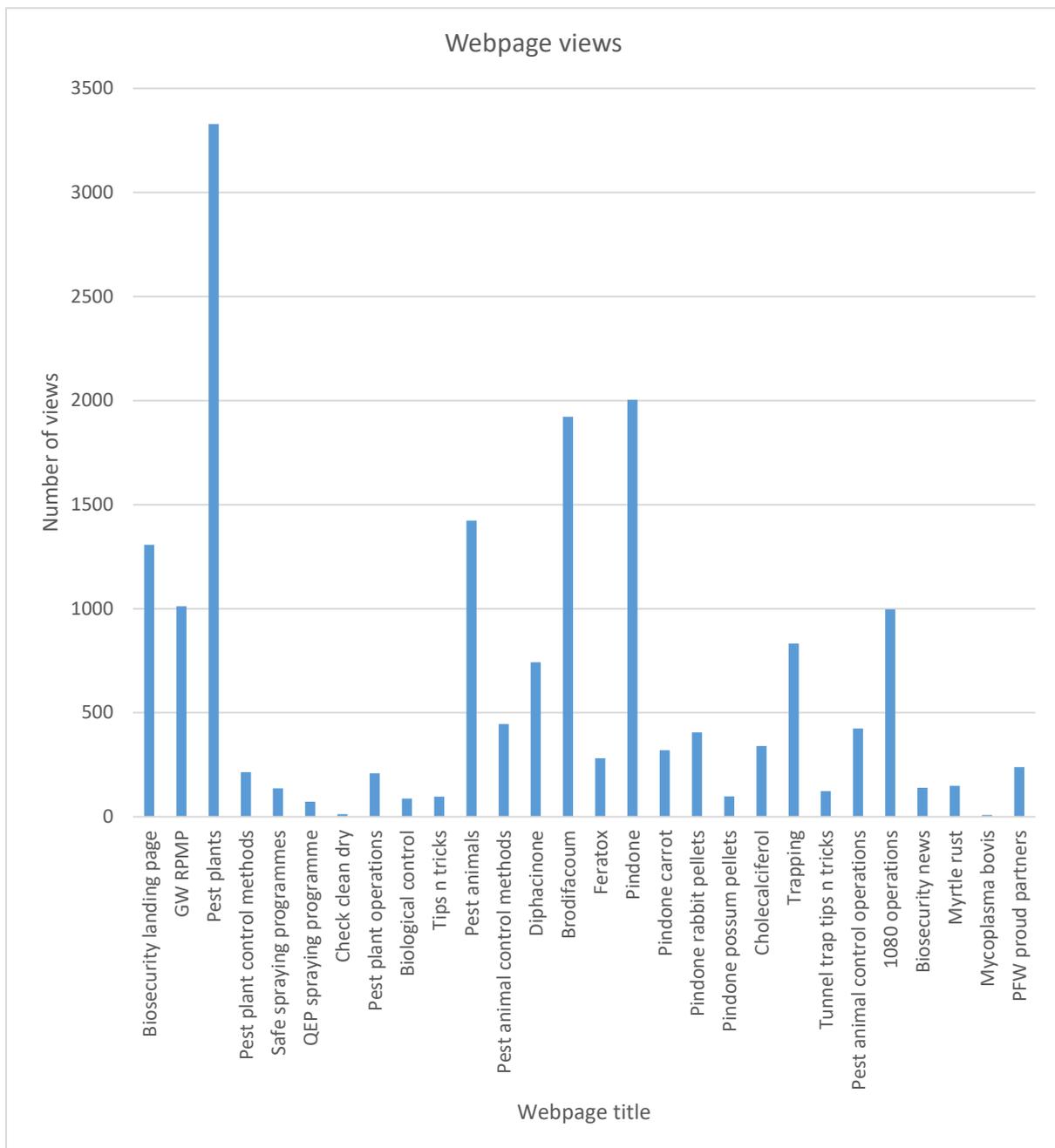
the trap boxes serviced by volunteers include a specific mouse trap) and incidental kills of mice removed 525 mice from the region.

**Public Enquiries**

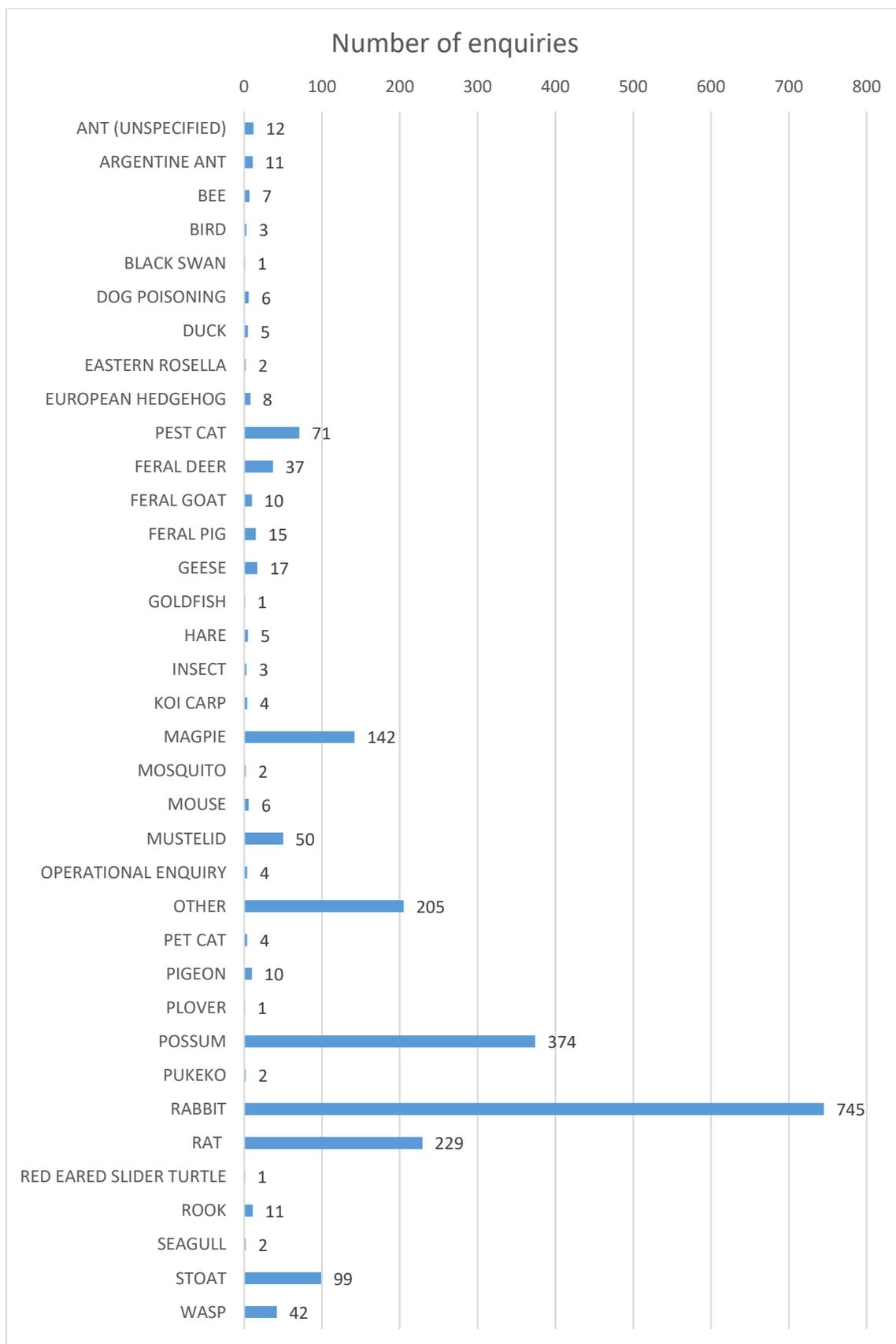
Significant increases in public interest for pest animal management issues continued this year with a total of 2,147 public enquiries compared to 1,010 last year.

Of these, 625 were related to sales of equipment and services, mainly for rabbits and possums. The public sought general information and advice in 1,542 enquiries, the bulk of which related to rabbits, followed by possums, rodents, mustelids and magpies, and pest cats.

See Graph 3 below for a breakdown by species or issue.



**Graph 2. Popularity of various Biosecurity webpages, titles as shown.**



**Graph 3. Pest Animal related enquiries received through the year by category.**

### 3. Pest Plants

#### 3.1 Programme results

In the 2020/21 year we carried out annual inspections on 154 ha of land and carried out intensive 'delimiting' surveys on 920 ha of land, searching for RPMP species, particularly in Featherston, Masterton, Ngawi, Lower Hutt, Paekākāriki, Raumati, Paraparaumu, Waikanae and Ōtaki. Our team surveyed another 930 ha of land in regional parks and KNE's, looking for other plants of concern (see the [RPMP Harmful organism list](#)).

We have compared the management outcomes of our pest plant programmes by species over the last two years of the RPMP implementation (Graph 4). Note that year 1 (2019/20) results were affected by the Covid-19 lockdown, with numerous sites not getting inspected.

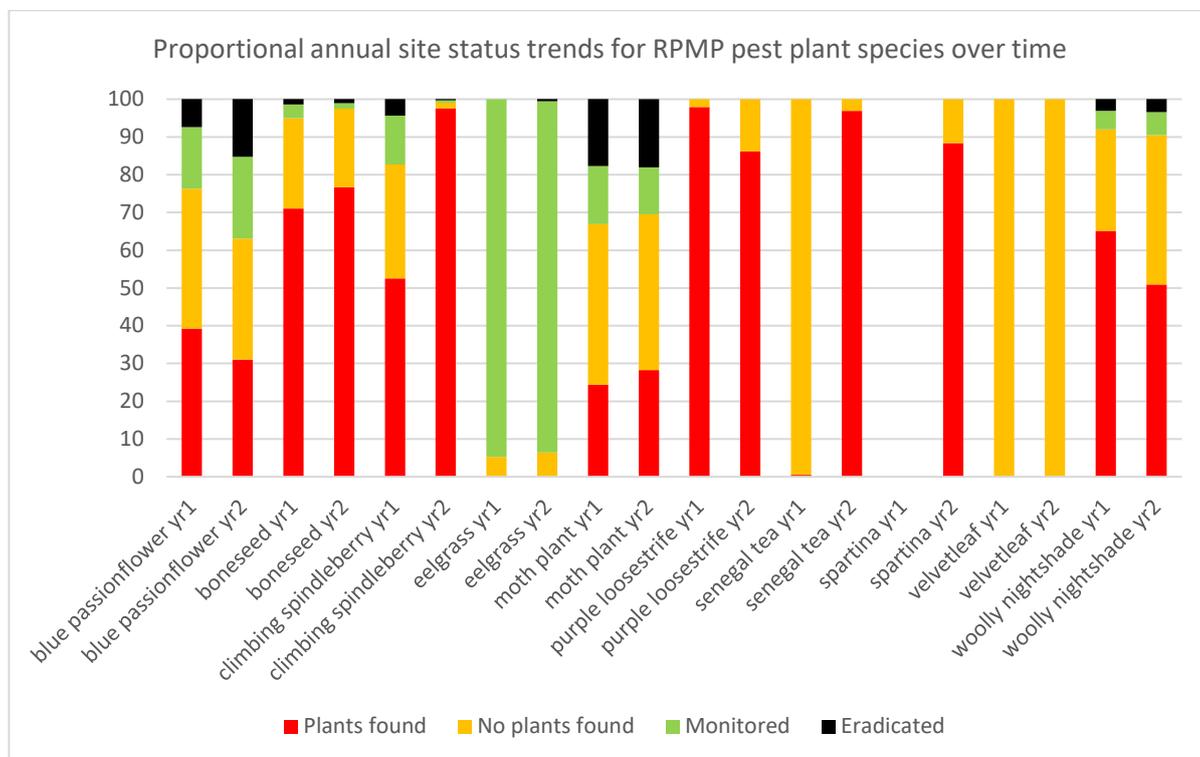
With regard to pest plant reporting, the following terminology is used:

Active sites ('plants found') are those where we find plants of the species being searched for.

Active sites ('no plants found') the site must remain clear of plants for four years before advancing to Monitored status.

Monitored sites have no plants of the target species present. We monitor these sites for another four years, checking for new plants or regrowth.

Eradicated sites have been monitored for sufficient time that we are satisfied the species has been eradicated from that particular site.



Graph 4. Plant species showing proportional management change over time

3.1.1 Alligator weed (*Alternanthera philoxeroides*), Chilean needle grass (*Nassella neesiana*), Nassella tussock (*Nassella trichotoma*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
No incursions of any of these species was detected this year.				

3.1.2 Moth plant (*Araujia hortorum*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We discovered 35 new sites, three in Martinborough, five in Masterton, six in Featherston, three in Waiwhetu, one in Ōtaki and the remainder in Raumati (2,112 m<sup>2</sup> of infested land).</p> <p><u><a href="#">2020/21 programme summary</a></u></p> <p>We have 175 sites (2.1 ha) infested with moth plant, of which 28 sites were categorised as eradicated.</p>				



Image 7. Vacuum assisted removal of seed from a moth plant infestation



Image 8. Moth plant site locations, historic and current



Image 9. New moth plant sites found 2020/21

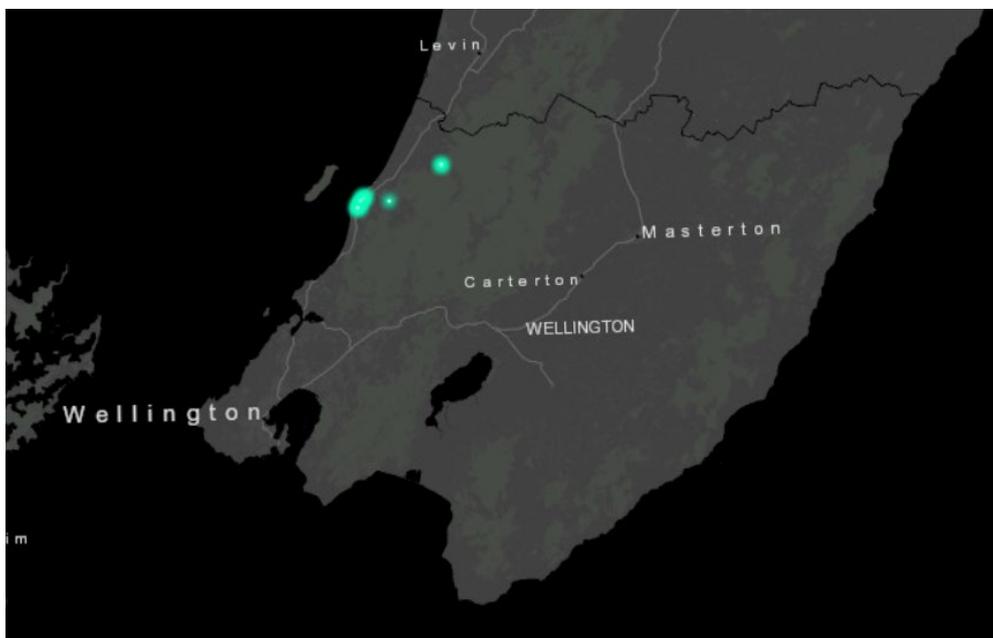
### 3.1.3 Senegal tea (*Gymnocoronis spilanthoides*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We discovered three new sites, two in Paraparaumu and one in Ōtaki (1,262 m<sup>2</sup> of infested land).</p> <p>Over summer we removed plants by hand from Kāpiti sites. This was followed up in March with further hand removal and spraying of larger sites.</p> <p><a href="#">2020/21 programme summary</a></p>				

We have 17 sites (8.5 ha) infested with Senegal tea, all in the early stages of management programmes.



**Image 10. Raft of Senegal tea growing in an urban pond**



**Image 11. Senegal tea site locations, historic and current**

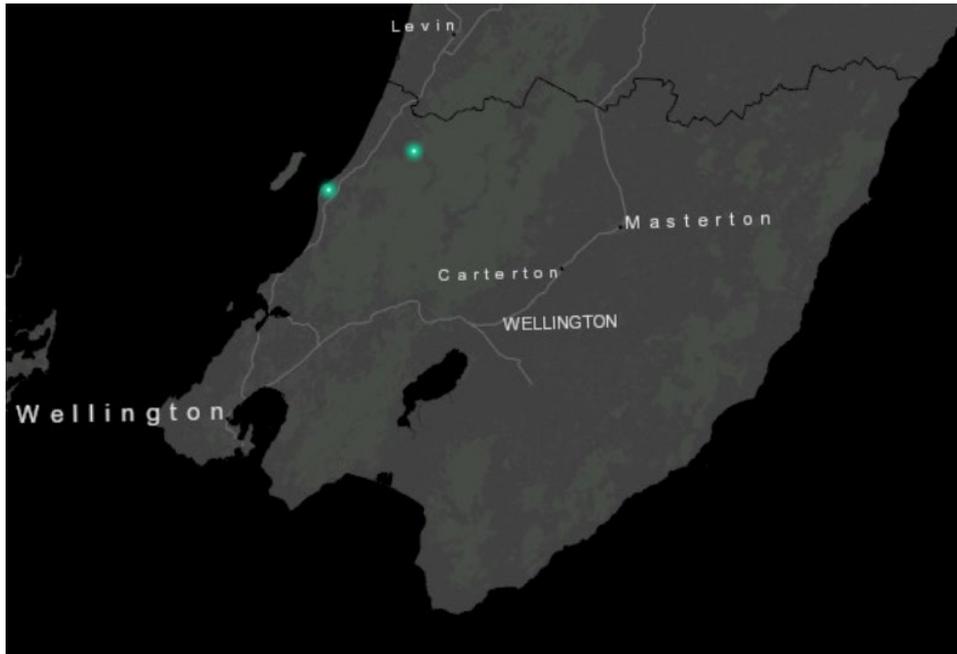


Image 12. New Senegal tea sites found 2020/21

3.1.4 *Spartina* (*Spartina anglica*, *S. alterniflora*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>Within the same general area, a new site of spartina (264 m<sup>2</sup>) was found near Beach Road on the Lake Onoke edge.</p> <p><u>2020/21 programme summary</u></p> <p>We have seven sites (1.8 ha) infested with spartina, also all in the early stages of management programmes.</p>				



Image 13. Spartina site locations, historic and current.



Image 14. New Spartina sites found 2020/21

### 3.1.5 Velvetleaf (*Abutilon theophrasti*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>There is only a very small amount of land infested with velvetleaf in the region. Annual inspections were completed, and no plants or sites were found.</p> <p><u><a href="#">2020/21 programme summary</a></u></p> <p>Four sites on two properties (only 30 m<sup>2</sup> of infested land) were inspected for velvetleaf.</p>				



Image 15. Velvetleaf site locations, historic and current (no new sites found in 20/21)

### 3.1.6 Woolly nightshade (*Solanum mauritianum*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We discovered 30 new sites, one just north of Masterton, one in Martinborough, one to the east of Lake Wairarapa, four in Lower Hutt, six in Ōtaki, five in Paraparaumu, nine in Waikanae, two in Raumati and one in Te Horo (3,513 m<sup>2</sup> of infested land).</p> <p><u><a href="#">2020/21 programme summary</a></u></p> <p>We have 129 sites (7.7 ha) infested with woolly nightshade, of which 19 sites were categorised as eradicated this year.</p>				



Image 16. A mask and protective clothing should be worn while removing woolly nightshade

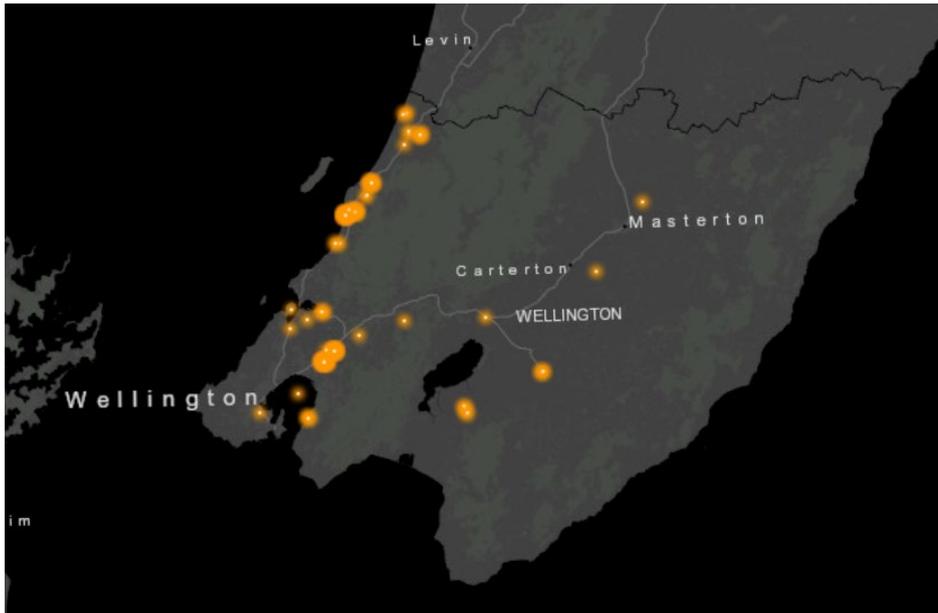


Image 17. Woolly nightshade site locations, historic and current



Image 18. New woolly nightshade sites found in 2020/21

3.1.7 Purple loosestrife (*Lythrum salicaria*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>One new site was found in Masterton (20 m<sup>2</sup> of infested land).</p> <p><u>2020/21 programme summary</u></p> <p>18 sites (14.1 ha) are infested with purple loosestrife, all in the early stages of management programmes.</p>				



**Image 19. Electric spray unit for easy control of purple loosestrife in an azolla-covered lake**



**Image 20. Purple loosestrife site locations, historic and current**



**Image 21. New Purple loosestrife sites found 2020/21**

3.1.8 Wilding conifers – European larch (*Larix decidua*), Douglas fir (*Pseudotsuga menziesii*) and pine species (*Pinus spp.*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
There is only one site of wilding pine control in the region. No work was carried out on wilding conifers in this financial year.				

3.1.9 Blue passionflower (*Passiflora caerulea*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We discovered 11 new sites, one in Masterton, four in Featherston and two at Whāngaimoana, three at Raumati Beach and one in Eastbourne (1,886 m<sup>2</sup> of infested land).</p> <p>Staff reviewed the blue passionflower programme with our environmental science team to develop a more strategic control approach to this weed species.</p> <p><u>2020/21 programme summary</u></p> <p>We have 157 sites (2.4 ha) infested with blue passionflower, of which 26 sites were categorised as eradicated this year.</p>				

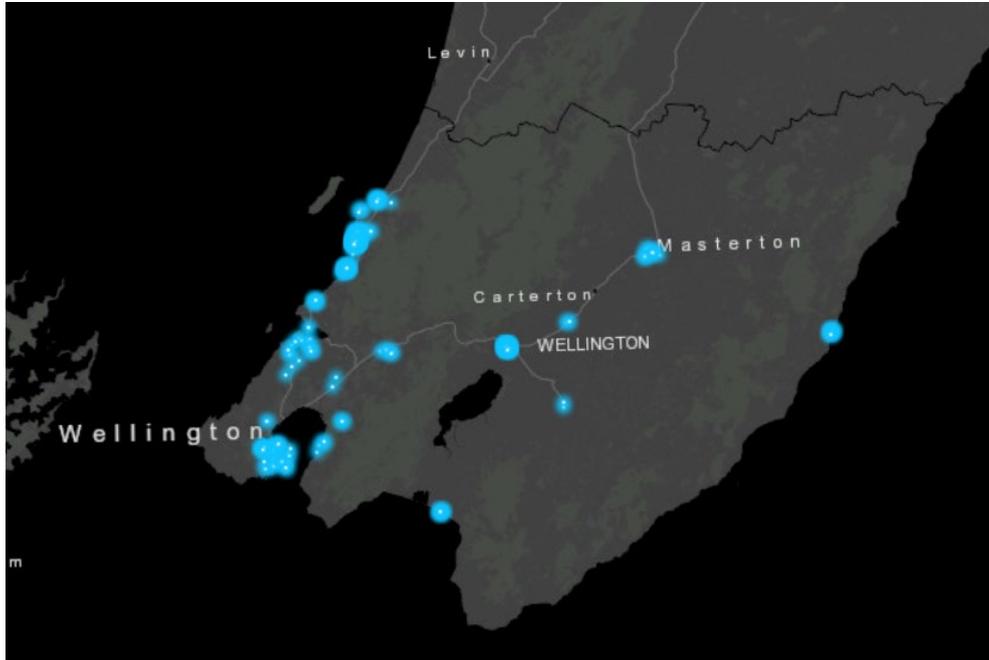


Image 22. Blue passionflower sites, historic and current



Image 23. New blue passionflower sites found in 2020/21

3.1.10 Boneseed (*Chrysanthemoides monilifera*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We discovered 31 new sites, one near Cape Palliser, one at Riversdale, one at Castlepoint, two in Paekākāriki and the remainder in Raumati South (2,356 m<sup>2</sup> of infested land).</p> <p>We control boneseed only in the region’s highest value coastal sites. Te Kopahau reserve (Wellington south coast) has been under control for 11 years now. As previously, we used a helicopter with an attached anterior wand to accurately spot spray boneseed plants on the otherwise inaccessible cliff.</p> <p><u>2020/21 programme summary</u></p> <p>We have 416 sites (87.9 ha) infested with boneseed and 70 sites were categorised as eradicated.</p>				



Image 24. Boneseed treatment areas, historic and current

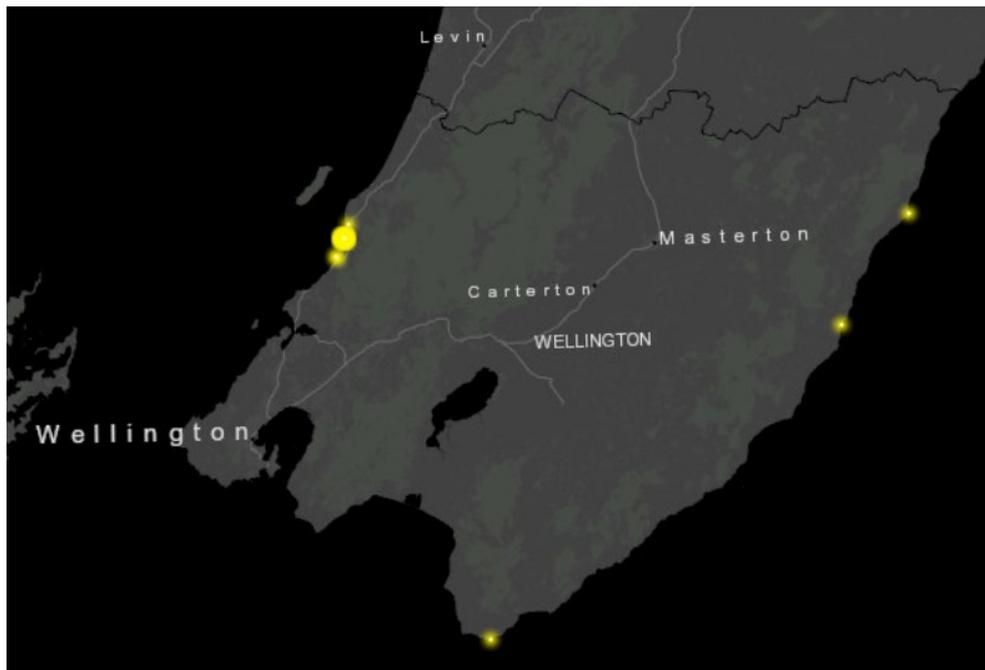


Image 25. New boneseed sites found in 2020/21

3.1.11 Climbing spindleberry (*Celastrus orbiculatus*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We discovered eight new sites, three in Martinborough, one near our boundary, towards Pūkaha/Mt Bruce, two in Wainuiomata and two in Raumati South (1,363 m<sup>2</sup> of infested land).</p> <p><a href="#">2020/21 programme summary</a></p>				

We have 42 sites (26.6 ha) infested with climbing spindleberry, of which six sites were categorised as eradicated.

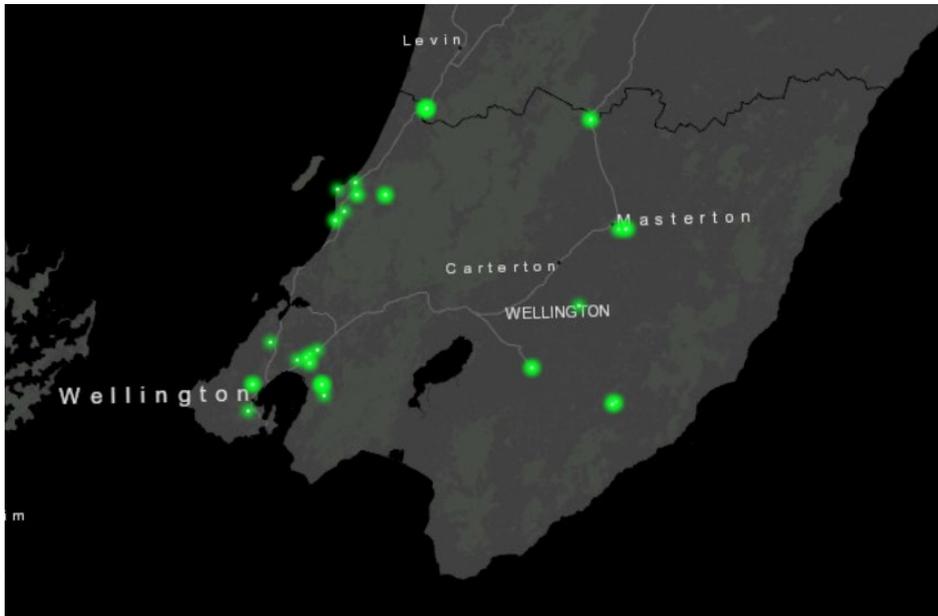


Image 26. Climbing spindleberry site locations, historic and current

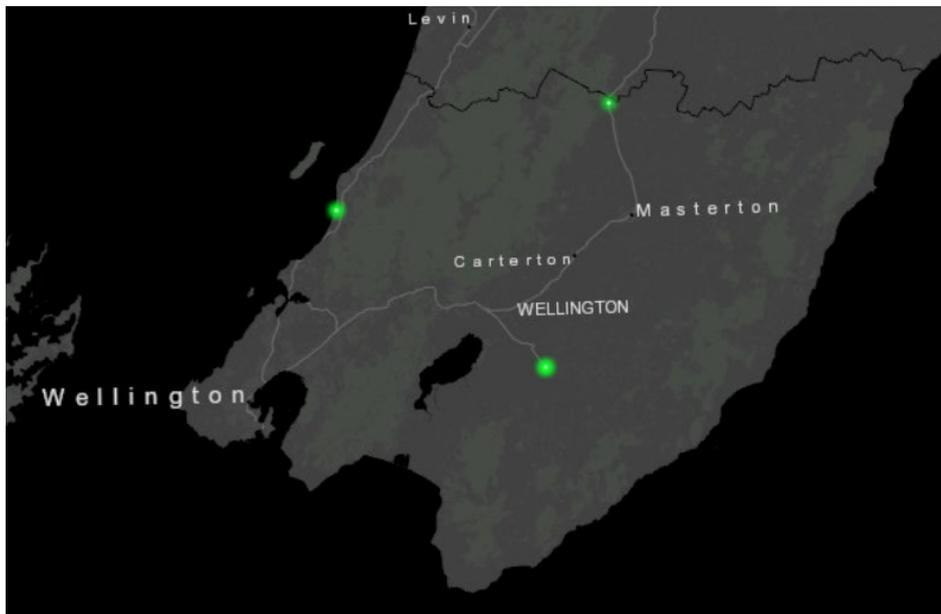


Image 27. New Climbing spindleberry sites found 2020/21

3.1.12 Eelgrass (*Vallisneria spiralis*, *V. gigantea*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
No new sites were found.				

2020/21 programme summary

We have eight sites (3.1 ha) infested with eelgrass, one of which was declared eradicated.



**Image 28. Eelgrass site locations, historic and current (no new sites found in 2020/21).**

3.1.13 Banana passionfruit (*Passiflora mixta*, *P. mollissima*, *P. tripartita*), Cathedral bells (*Cobaea scandens*), Old man’s beard (*Clematis vitalba*)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
This programme is undertaken by the Hutt City Council. Our assistance (and only GW involvement with the programme) was not required to gain access to the properties under the programme.				

3.1.14 Key Native Ecosystems, Reserves and Forest Health (Pest Plants)

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
Our staff carried out control work in 57 KNE’s, as well as Regional Parks and a number of wetlands, whether directly or by contracting work out. Exotic species are prioritised for control in the KNE operational management plans. The representative list of species controlled can be seen in our <a href="#">RPMP list of Harmful organisms</a> .				



**Image 29. Drone spraying to control willows in a wetland**



**Image 30. Succulent control at Cape Palliser**

### 3.1.15 Biocontrol

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p>We received four releases of tradescantia yellow leaf spot from Manaaki Whenua Landcare Research (MWLCR) which were distributed in Wellington and Upper Hutt, and one release of Japanese honeysuckle white admiral butterfly which was also released in Upper Hutt. At the butterfly release site, the intention is to bolster an existing population. During the release staff saw caterpillars of this species eating honeysuckle leaves, which is an excellent sign of at least some specimens breeding at the site from the previous release.</p>				

This year we transferred smilax rust to Kāpiti, and in Wairarapa we transferred green thistle beetles (agent for Californian thistle) to a new site as well as transferring scotch thistle gall fly to four new sites.

We are actively monitoring release sites for multiple agents to determine whether populations are establishing, and whether the population is abundant enough that we can take some of the agents to release elsewhere in the region.

Our team were responsible for managing monitoring for the Nodding thistle crown weevil for the National Biocontrol Collective. The release sites were monitored for the second and final time for this project. Manaaki Whenua Landcare Research is processing gathered data on behalf of the collective.

Staff attended the annual National Biocontrol Collective meeting, where a nationwide strategic approach is taken to help decide how funding can be directed to best effect.



**Image 31. Tradescantia yellow leaf spot fungus release material**



**Image 32. Monitoring the abundance of a biocontrol population**



**Image 33. Collecting Californian green thistle beetles (vacuum method) to start new populations**

### 3.1.16 Surveillance and Engagement

Exclusion	Eradication	Progressive containment	Sustained control	Site-led
<p><b>Engagement</b></p> <p>Staff gave presentations to a number of groups through the year, such as school children who wanted to learn about aquatic weed identification, and the Herb Society who wanted a general overview of our activities.</p> <p>We gave educational presentations to other GW departments on our RPMP pest plant species and basic biosecurity hygiene practices to follow when undertaking field activities and site visits.</p> <p>Our Biosecurity Manager was part of a ‘Sleeper Pest’ research project workshop in Wellington organised by Manaaki Whenua Landcare Research (MWLCR). This looked at what pests might become problems due to climate change and was attended by biosecurity experts representing DOC, MPI, primary industry associations and regional councils.</p> <p>Our senior staff met with staff from Horizons Regional Council to discuss pest plant management in our two regions, another strategic approach where we can assist each other’s efforts especially around our mutual border.</p> <p>All of our Pest Plants team staff attended aquatic pest plant management training delivered by NIWA and organised by Horizons Regional Council. A wide variety of volunteer groups, biosecurity staff and key contractors from around the lower North Island attended this, and all found it hugely valuable.</p>				

Throughout the year our GW Customer Engagement team worked on social media pest plant related posts. These seemed popular and received a lot of feedback, especially the post featuring pampas grass. Posts were published according to the time of year when the particular RPMP plant species would be most visible. This resulted in a number of enquiries, which helped us in finding new, previously unknown sites.

Referring back to Graph 2, our pest plants webpage is the by far the most commonly visited Biosecurity webpage.

### **Public enquiries**

We received 246 enquiries during the year, with the majority regarding old man's beard. A number of aquatic plant enquiries came through with people interested in long term solutions for controlling aquatic pest species and seeking advice on riparian planting. Some new sites of RPMP species were reported by the public (Graph 7).

### **Species of Interest**

In the course of our work, we noted locations and infestations of invasive plants that are not part of RPMP species programmes, but which pose serious threats to our operations in sites of high native biodiversity values (eg. KNE and TA reserve sites).

We controlled the sites of *Polypodium vulgare* we found at Cape Palliser last financial year, and there is continued discussion about *Lomatia fraseri*, with it likely to be controlled in KNE's that we work in if it is found there.

A site of white edge nightshade in the Wairarapa was reported to the team and we visited to assess the infestation. This species is on our Harmful Organisms list in the RPMP and is known for its invasive potential elsewhere in the country. This seems to be the only site in our region, so control work is likely.

### **Ministry for Primary Industries programmes supported by GW**

#### Check Clean Dry Programme

The aim of this MPI funded programme is to increase public awareness of aquatic freshwater pests. We have a decade long history of successful delivery of this programme on behalf of MPI.

This year's focus was on having staff present at as many fresh water/outdoor events within the region as possible. Our staff attended eight sporting/outdoor events to advocate for the Check, Clean, Dry programme and ensure proper hygiene measures were met.

Tactics used over the season included waterside advocacy and media releases, which seemed successful in promoting the CCD campaign with the message well received.

Public knowledge of freshwater pests is still limited within the region with most only aware of didymo: other freshwater pests are not well known. However, most people approached wanted to learn more, with a particular interest in how they can be removed from waterways.

The freshwater user surveys were a good way of gaining a better understanding of the public's comprehension of CCD/pest plant organisms. Surveys were completed during events and entered into the Survey123 freshwater user app.

Overall, freshwater user's adherence to the CCD method was not high enough, with most respondents only following the method 'sometimes'. This shows that there is still room for improvement in future years.

### National Pest Plant Accord

We inspected a number of plant nurseries and sale outlets through the year and saw no plants listed on the NPPA.

Information was provided to organisers of the 'Neighbours Day Aotearoa – Great Plant Swap' which ran nationwide in March. This allowed them to inform participants of the NPPA and obligations around species in the Accord before the event.

### National Interest Pest Response programme

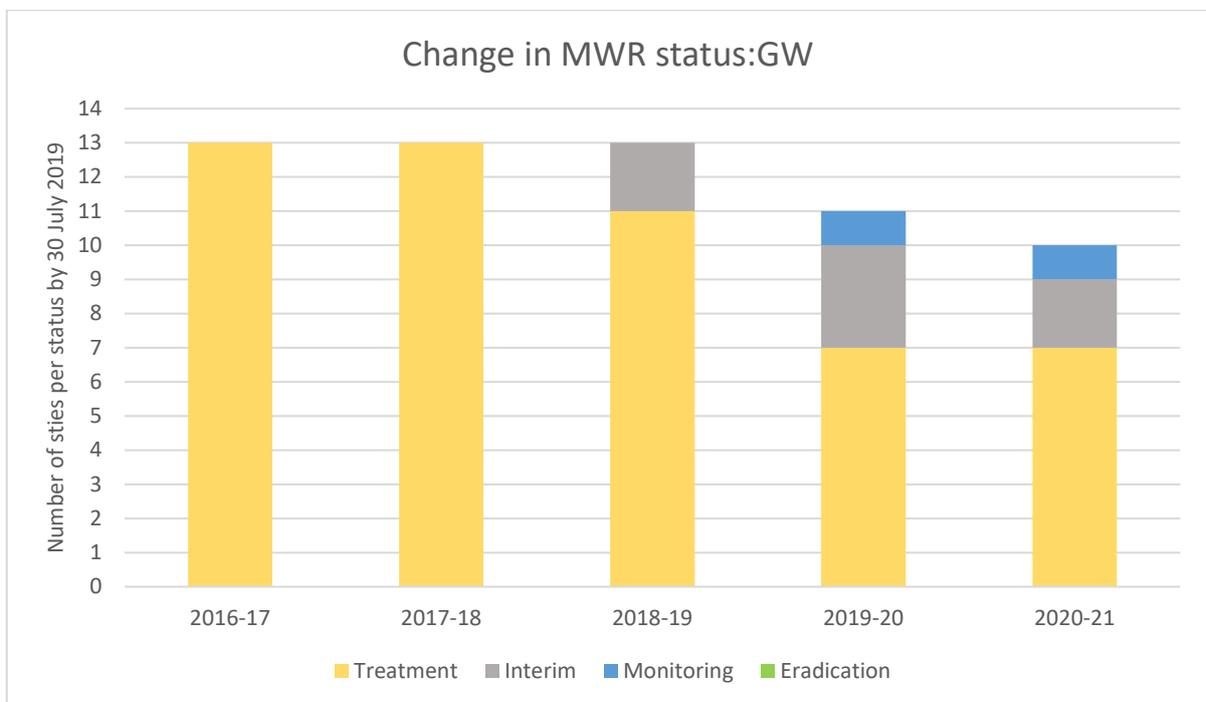
#### Cape Tulip

No plants were found in this year's site inspections.

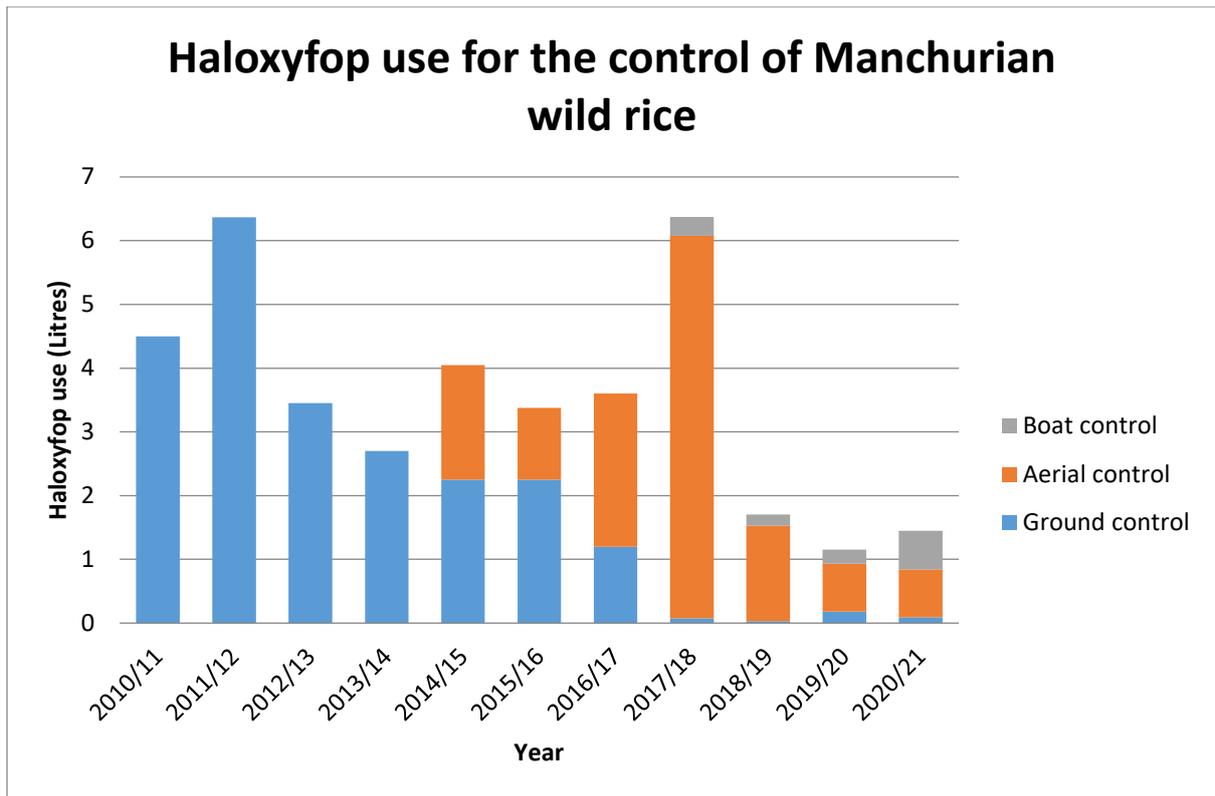
#### Manchurian Wild Rice

We continued control of Manchurian wild rice (MWR) at Pharazyn Reserve in Waikanae and an adjacent wetland with an aerial spray application and two ground and boat control spraying operations. We are making a good progress in controlling MWR (Graph 5). We continue to develop and improve our control techniques and work closely with MPI.

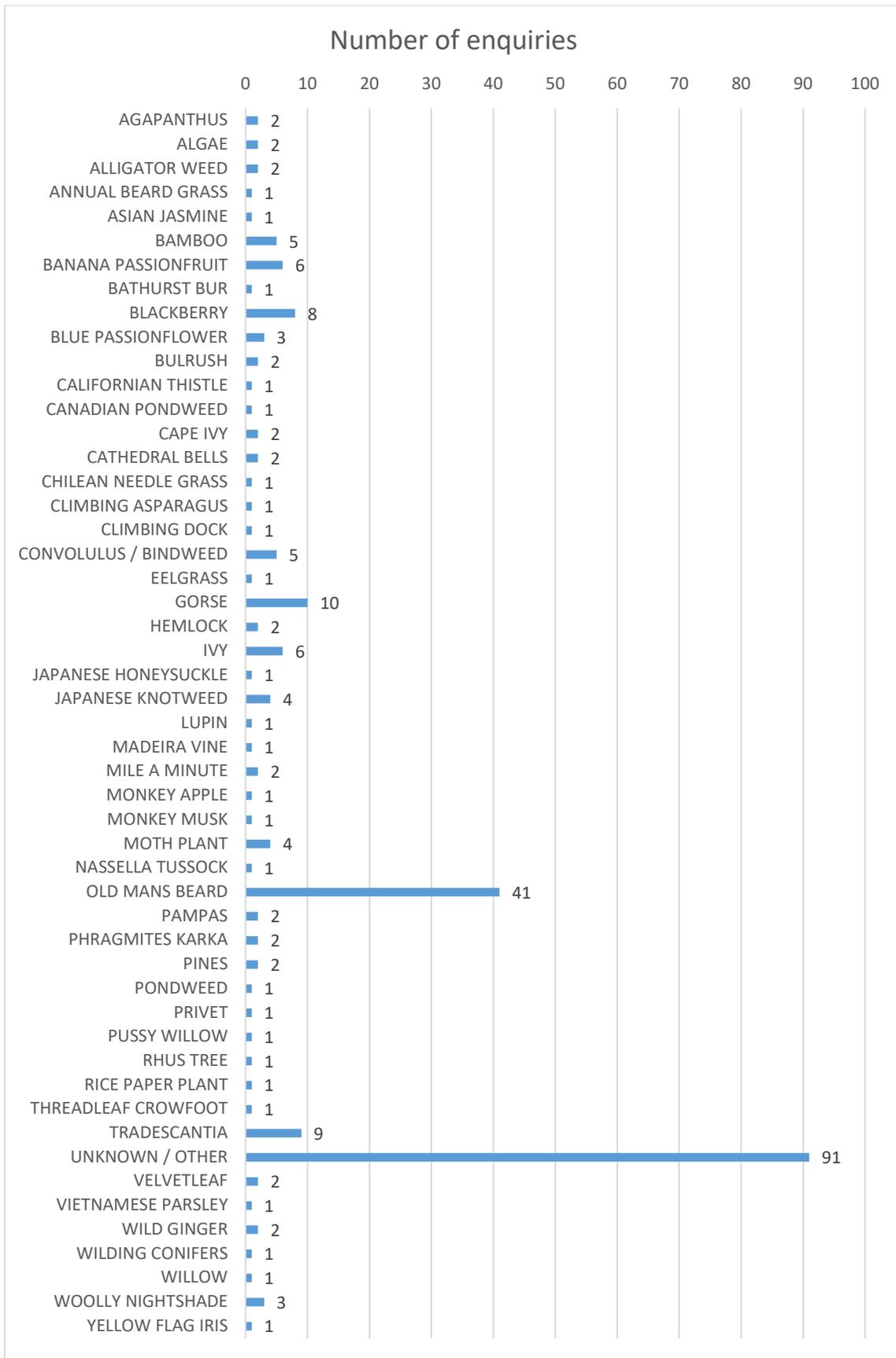
Water testing and monitoring is a requirement of this work, so we recorded pH and dissolved oxygen in the water immediately before spraying herbicide and within 24-72 hours afterwards. We also tested water for traces of haloxyfop herbicide both immediately before hand and within 24-72 hours following spraying. There were no issues with any test results, all were well within recommended parameters. We also maintain data of our different control methods and volumes of herbicide concentrate used over the last 11 years (Graph 6).



**Graph 5. Reduction of Manchurian wild rice sites over time in the Wellington region**



**Graph 6. Comparison of herbicide volume used and control methods for the last 11 years.**



**Graph 7. Plant related enquiries received through the year by category**

#### 4. Actual costs

The table below summarises the costs of implementing the Plan in 2020/21:

	<b>Species-Led</b>	<b>Site-Led KNE and TA</b>	<b>Total</b>
<b>Pest Animals</b>	\$1,608,000	\$797,200	\$2,405,200
<b>Pest Plants</b>	\$1,218,200	\$589,200	\$1,807,200
<b>Biocontrol</b>	-	-	\$120,000
<b>Landscape RPPCP</b>	-	-	\$1,272,400
<b>Predator Free Wellington</b>	-	-	\$2,000,900
<b>Total</b>	<b>\$2,826,000</b>	<b>\$1,386,400</b>	<b>\$7,605,700</b>

## Appendices:

### Appendix 1 – Biocontrol agents released in the Wellington region

Agent species name	First released	Total number of known sites	Overall agent status
<b>Boneseed agents</b>			
Boneseed leaf roller	2007	8	suspect failure
<b>Broom agents</b>			
Broom gall mite	2009	800+	established
Broom leaf beetle	2009	3	uncertain
Broom psyllid	1995	1000+	widespread
Broom seed beetle	1994	600+	widespread
Broom shoot moth	2008	3	uncertain
<b>Buddleia agents</b>			
Buddleia leaf weevil	2007	100+	becoming widespread
<b>Darwin's barberry agents</b>			
Darwin's barberry seed weevil	2016	4	uncertain, but still present
<b>Gorse agents</b>			
Gorse colonial hard shoot moth	2002	5	failed
Gorse pod moth	1997	abundant	widespread
Gorse soft shoot moth	2007	12	uncertain
Gorse spider mite	1989	abundant	widespread
Gorse thrips	1990	abundant	widespread
<b>Hemlock</b>			
Hemlock moth	-	-	widely established
<b>Japanese Honeysuckle</b>			
Japanese Honshu white admiral butterfly	2017	8	uncertain, new release
<b>Mistflower agents</b>			
Mistflower gall fly	2001	2	established
Mistflower fungus	2009	1	established

<b>Old man's beard agents</b>			
Old man's beard leaf fungus	1997	3	failed
Old man's beard leaf miner	1995	abundant	widespread
Old man's beard sawfly	2002	2	failed
<b>Privet agents</b>			
Privet lace bug	2015	1	failed
<b>Ragwort agents</b>			
Cinnabar moth	2006	abundant	widespread
Ragwort plume moth	2012	7	established
Ragwort flea beetle	1988	abundant	widespread
<b>Smilax agents</b>			
Smilax rust	2020	1	uncertain, new release
<b>Thistle agents</b>			
Californian thistle flea beetle	1994	2	failed
Californian thistle gall fly	2006	1	failed
Californian thistle leaf beetle	1993	2	failed
Californian thistle stem miner	2010	2	uncertain
Green thistle beetle	2008	221	becoming widespread
Nodding thistle receptacle weevil	1972	9	widespread
Nodding thistle crown weevil	1990	4	established
Nodding thistle gall fly	2005	12	established
Scotch thistle gall fly	2005	79	established
<b>Tradescantia agents</b>			
Tradescantia leaf beetle	2011	8	established
Tradescantia stem beetle	2012	10	uncertain
Tradescantia tip beetle	2013	7	uncertain
Tradescantia yellow leaf spot fungus	2018	4	uncertain, new release
<b>TOTALS:</b>		<b>3000+</b>	

## Appendix 2: Modified McLean Scale

Scale	Rabbit Infestation
1	No sign seen. No rabbits seen.
2	Very infrequent sign seen. Unlikely to see rabbits.
3	Sign infrequent with faecal heaps more than 10 metres apart. Odd rabbit may be seen.
4	Sign frequent with some faecal heaps more than 5 metres apart, but less than 10 metres apart. Groups of rabbits may be seen.
5	Sign very frequent with faecal heaps less than 5 metres apart in pockets. Rabbits spreading.
6	Sign very frequent with faecal heaps less than 5 metres apart over the whole area. Rabbits may be seen over whole area.
7	Sign very frequent with 2-3 faecal heaps often less than 5 metres apart over the whole area. Rabbits may be seen in large numbers over the whole area.
8	Sign very frequent with 3 or more faecal heaps less than 5 metres apart over the whole area. Rabbits likely to be seen in large numbers over the whole area.

For more information, please contact Greater Wellington:

**Wellington office**

PO Box 11646  
Wellington 6142

**Upper Hutt office**

PO Box 40847  
Upper Hutt 5018

**Masterton office**

PO Box 41  
Masterton 5840

[www.gw.govt.nz](http://www.gw.govt.nz)

[info@gw.govt.nz](mailto:info@gw.govt.nz)

**T 04 384 5708**



November 2021