



# Regional Pest Management Strategy – Operational Plan Report 2012/13

Quality for Life



greater WELLINGTON  
REGIONAL COUNCIL  
Te Pane Matua Taiao





# Regional Pest Management Strategy 2002-2022

Operational Plan Report 2012/13

Biosecurity Department

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## **1. Introduction**

### **1.1 Biosecurity at the Greater Wellington Regional Council**

The Wellington region is under threat from a number of pest animal and plant species. The Greater Wellington Regional Council (GWRC) is involved in the control of unwanted plants and animals for environmental, economic and social reasons:

- 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;
- 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 agricultural industries;
- Pest plants and pest animals cause a considerable nuisance to many aspects of rural and urban life, inhibiting the ability of people to enjoy their property, lifestyle and wellbeing.

The Regional Pest Management Strategy 2002-2022 (RPMS) provides the strategic and statutory framework for effective pest management in the Wellington region. The central focus of the RPMS is on mitigating pest threats to society, to farming and agriculture in general, and supporting indigenous biodiversity and health of our ecosystems. There are two major objectives:

- to minimise the actual and potential adverse and unintended effect of pests on the environment and the community; and
- to maximise the effectiveness of individual pest management programmes through a regionally coordinated response.

GWRC has implemented the RPMS for 11 years and many advances in the effective management of a wide range of pest plants and pest animals have been made in that time. In response, indigenous biodiversity has been enhanced and local economic values protected over large parts of the region. We were able to achieve this due to support from landowners, care groups and local authorities.

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

This document reports against the achievements and outcomes of GWRC's biosecurity related activities. The work programme was set by the RPMS Operational Plan 2012/13, which is based on achieving the objectives of the RPMS. All works are approved via the GWRC Annual Plan, which sets the overall priorities and work programmes for the organisation.

The implementation of the RPMS 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 of how and where those resources

were applied in the 2012/13 year in implementing the Operational Plan.

The report is structured in two parts:

- Pest animals
- Pest plants

The content is organised to correspond with the Operational Plan 2012/13. In the pest animals and pest plant sections the aim, cost, means of achievement, and the actual performance is reported on for each pest species or activity.

The pest management activities under the RPMS in 2012/13 were delivered with an operating surplus of \$283,300 and total operating expenditure of \$4,441,300.

## Part One

### Pest Animals

#### 2. Species led programmes

##### 2.1 Surveillance species

**Aim:** To prevent the establishment or minimise the impact, and prevent the further spread, of animal surveillance species in the region at a cost of \$24,432.

**Annual cost:** The cost of surveillance species management (monitoring, investigation, publicity and reporting) for the region was \$3,925.

The species in this category are Argentine ants, Australian subterranean termites, Darwin's ant, rainbow skink, and red-eared slider turtle.

##### **Means of achievement**

Provide information and publicity to enhance public awareness of the surveillance species.

##### Actual performance

In the 2012/13 year there was very little activity around these species. There were a small number of public enquiries requesting information which were actioned. We are now able to direct the public to websites providing control information, such as the Landcare Research (LCR) web-page for Argentine ants.

##### **Means of achievement**

Record and report any incidences of the Surveillance species in the region.

##### Actual performance

There was one report of Argentine ants in Waikanae. A delimiting survey was carried out and they appear to have spread 100 metres from a now closed plant nursery into the surrounding area. The infestation had been there several years. Information was provided to the complainant about control options.

A member of the public reported the suspected sighting of a dead or dying snake on Mt Victoria in Wellington in February 2013. Given the proximity of the site to the wharves and the detailed description an incursion appeared to be possible. The Ministry for Primary Industries requested the help of GWRC staff to inspect the site. A visual inspection of the area occurred but found no evidence of the snake.

##### 2.2 Retailer inspections of pests listed in the Strategy

During the 2012/13 year staff inspected 63 premises, including a selection of pet shop retailers and veterinarians, across the region to ensure compliance with the Strategy rules. No breaches were identified. Generally retailers have a good understanding of which types of animals they can legally sell.



### **3. Total Control – rooks**

**Aim:** To manage rooks as a Total Control category pest to levels that protects production systems at a cost of \$74,656

**Annual cost:** The cost of rook management (surveys, research, compliance, education) for the region was \$35,159

#### **Means of achievement**

Undertake direct control by Service delivery where rooks are known to exist.

#### Actual performance

In the 2012/13 year, there were a total of eight known breeding rookeries in the region, all in the Wairarapa. To control rooks, nests are hand baited with a poison paste by an operator slung under a helicopter. There were 44 nests baited at these breeding rookeries.

During the breeding season staff observed rooks residing in the Ohariu Valley in Wellington. There was no evidence of nesting in the area.

For a number of years GWRC have not received any reports of damage to crops in the region. The rook control programme remains on track to achieve total control of rooks in our region by 2025. The number of treated nests has reduced from 150 in 2009/10, 98 in 2011/12, to 44 in 2012/13.

#### **Means of achievement**

Survey rook populations annually in areas where they are known to exist, and where new infestations are reported.

#### Actual performance

GWRC holds records of 110 rookery sites in the region (historical and current). All of the sites were visited to determine the presence or absence of rooks in the 2012/13 year. Some ground surveys are followed by aerial surveys in spring to establish the state of a rookery (presence/absence of nests, eggs and/or chicks). Knowing the state of a rookery is critical for efficient timing of aerial control.

Beside surveys, staff rely heavily on the public and landowners in the region to help with locating rooks. The control programme is publicised annually on the radio and in newspapers urging the public to report sightings of rooks or rookeries. As a result we received information about two new rookeries and the reactivation of one old rookery this year.

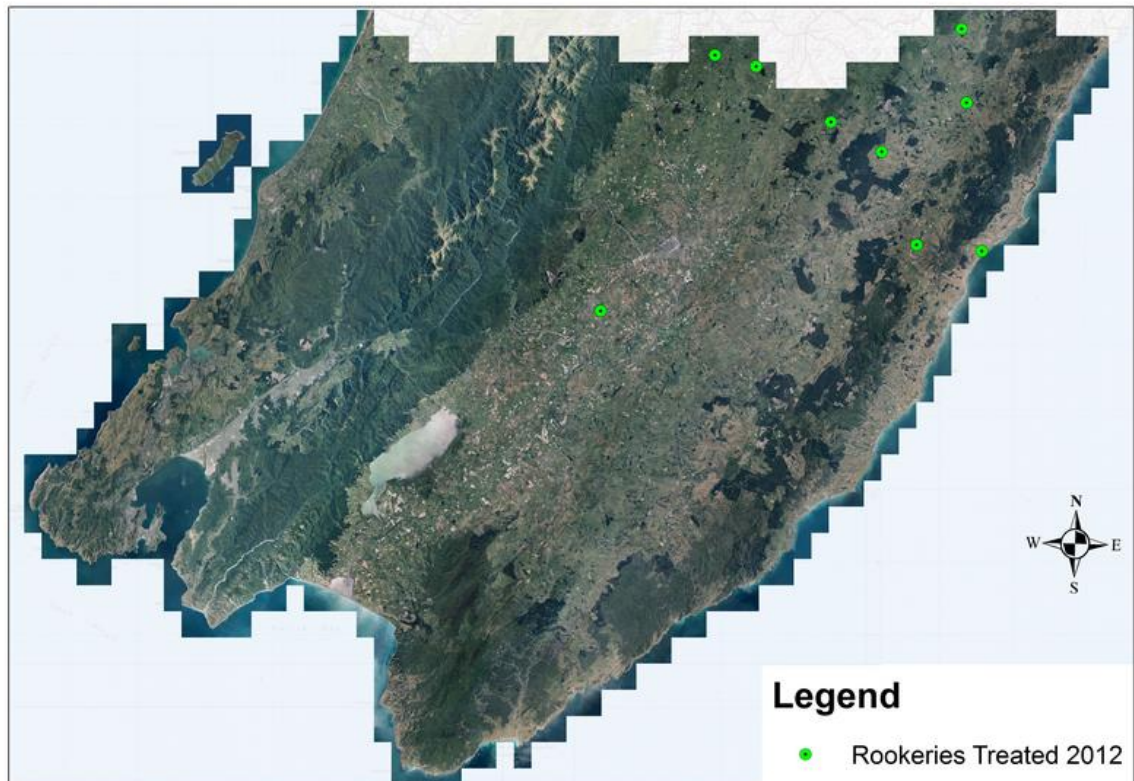


Figure 1. Rookeries treated in 2012 season

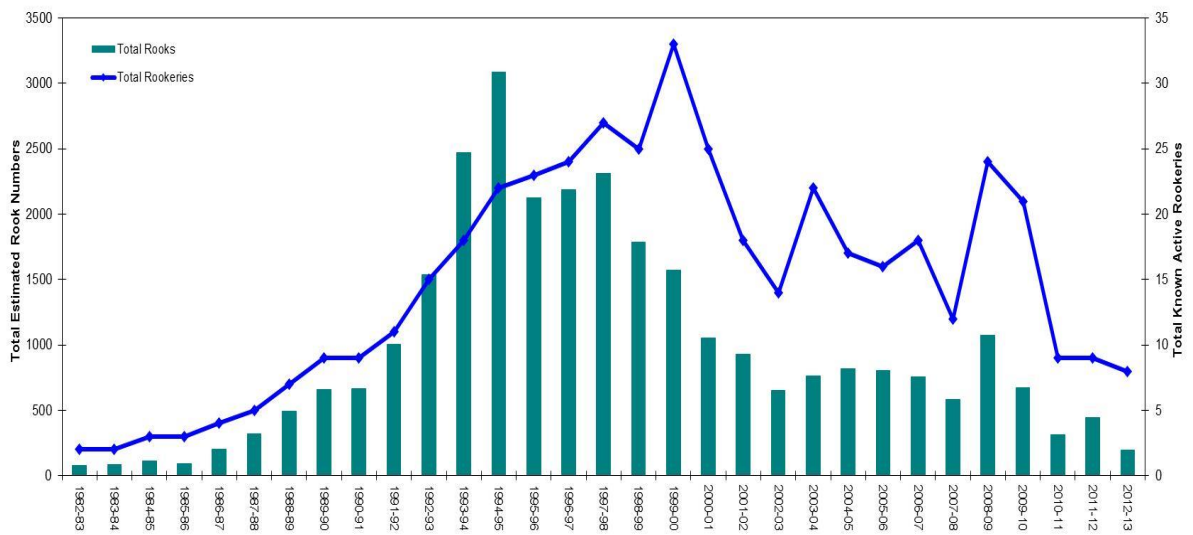


Figure 2. Total number of rookeries and number of rooks (estimated) in the Wellington region

### **Means of achievement**

Ensure compliance with the RPMS rules.

### Actual performance

Rooks are both shy and cunning birds, and poorly conducted attempts at control can lead to rookery fragmentation and dispersal over a wider area. Rooks may become bait shy if ground baiting is conducted using inappropriate methods and baits. Public/landowner education is the key to ensure control is managed by GWRC.

Local media and events such as the Masterton A & P Show and field days are used to educate the public on the importance of appropriate rook control.

### **Means of achievement**

Encourage Horizons Regional Council to actively pursue management of rooks within their region that complements GWRC's Total Control programme.

### Actual performance

Horizons Regional Council was actively involved with aerial nest baiting in the 2012/13 year. Both GWRC and Horizons have cooperated in the annual joint nest baiting programme on both sides of the regional boundary. The programme was designed to prevent the southward migration of rooks into the Wairarapa. Horizons staff are now manufacturing the DRC1339 gel bait for their control programme and for GWRC. Horizons Regional Council recorded a significant rook population reduction of approximately 50% after the conclusion of its aerial control season.

## **4. Suppression species – rabbits**

**Aim:** To minimise the adverse impacts of feral rabbits throughout the region at a cost of \$108,590

**Annual Cost:** The cost of rabbit management (surveys, service delivery, biological control, compliance, education and research) for the region was \$83,919

### **Means of achievement**

Undertake direct control by Service delivery to control rabbits on riverbeds, esplanades or similar public commons to ensure that rabbits do not exceed Level 5 of the Modified McLean Scale (Table 1).



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.

Table 1. Modified McLean Scale

### Actual performance

Rabbits have continued to be an amenity nuisance around Riversdale and Castle Point beaches but there were no control works carried out. There were no situations in the Wairarapa that required regulatory intervention.

There was one location that scored level 5 on the Modified McLean scale in the Western side of the region, a traffic island on State Highway 1 opposite Papakowhai, Porirua (managed by Transit). The area was monitored over two months and the population naturally decreased in this period (level 3-4 on Modified McLean scale).

Most rabbit control work during the year was undertaken to protect new plantings in re-vegetation projects by care groups, territorial authorities (TAs) and private land owners. A variety of control methods were used. Regular night shooting in parks, reserves and cemeteries was undertaken for Wellington City Council, Hutt City Council and Kapiti Coast District Council. Costs for these activities are fully recovered.

### **Means of achievement**

Survey land in high to extreme rabbit prone areas to determine the extent of rabbit infestation.

### Actual performance

Biosecurity staff surveyed the Tauherenikau River and eight adjacent properties. At these sites rabbit densities did not get above level 2-3 on the Modified McLean Scale. Historically, this area supported high numbers of rabbits and is used as an indicator site for the Wairarapa Valley.

Daytime surveys were carried out at four random properties in the Wairarapa that have previously had a history of high rabbit numbers. Property locations range from the Tararua range to the east coast and provide an overview of current rabbit trends for the region. Rabbits appeared to be in lower numbers than in 2012, which was unexpected given the prolonged dry spell over the summer months.

The rabbit prone areas of the Kapiti Coast were monitored in late May 2013, with rabbits present throughout the area in low numbers. Hot spots still exist around park areas, lifestyle blocks and smaller private properties with good rabbit cover and overgrazed pasture or large expanses of lawns. No properties were over level 5 on the Modified McLean Scale.

The numbers of rabbits are likely to remain relatively low in the foreseeable future as Rabbit Haemorrhagic Disease (RHD) continues to cycle naturally in most of the Greater Wellington region.

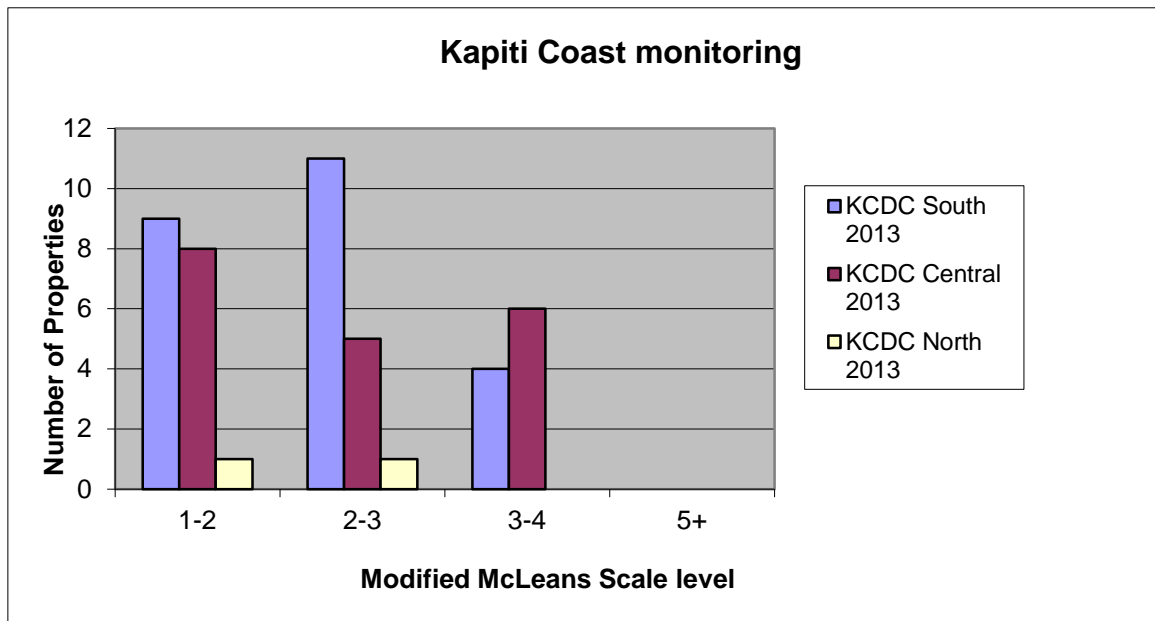


Figure 3. Rabbit monitoring results for the Kapiti coast during 2012/13

### Means of achievement

Provide information and publicity to enhance awareness of the threat rabbits pose to the region.

#### Actual performance

GWRC has electronic and printed information available to assist occupiers with self-help rabbit control. These are freely available to the public. Several community events were supported during the year and those attending were provided with educational material.

### Means of achievement

Release biological control agents for the control of feral rabbits when appropriate.

#### Actual performance

GWRC did not reintroduce the Rabbit Haemorrhagic Disease (RHD) virus in the 2012/13 period. The virus continues to cycle naturally in most of our region.

## Means of achievement

Support research initiatives including biological control.

## Actual performance

GWRC supported a national effort by a number of regional councils to retain an active permit to import RHD antibodies for release.

### 4.1 Rabbit trend monitoring

Rabbit and hare night counts are conducted in May or July each year in Queen Elizabeth Park on the Kapiti Coast and on the Tora Coast, in the Wairarapa. Counts are completed over three fine nights. The aim of the monitoring is to determine the trend over time of rabbit and hare activity at these two sites in the absence of formal rabbit and hare control.

The average number of rabbits counted on the Tora coast remains below 15 and has been at this level since 2002. The average number of rabbits and hares in Queen Elizabeth Park remains low, averaging two counted per night. No monitoring was undertaken in 2012.

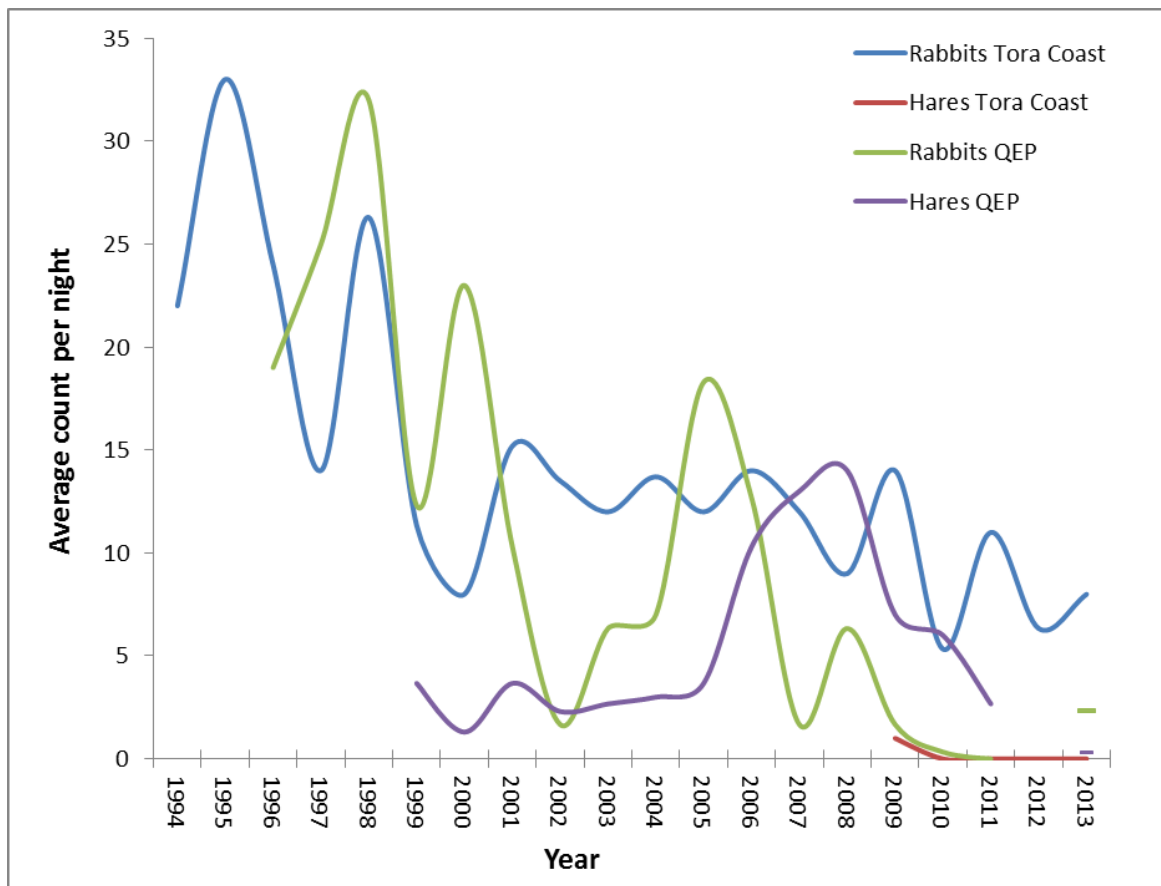


Figure 4. Rabbit and hare night trend monitoring results

## **5. Site-Led species – magpies**

**Aim:** To manage magpies to minimise adverse environmental and human health impacts in the Wellington region at a cost of \$33,935

**Annual Cost:** The cost of magpie management to minimise adverse environmental and health impacts for the region was \$36,050

### **Means of achievement**

Undertake direct control of magpies by service delivery where there is known to be a threat of injury to members of the public or complaint(s) are made to that effect within 10 working days.

### Actual performance

Twenty eight complaints were logged in the Wairarapa and three in the Western Zone regarding attacking magpies. All complaints were attended to within 10 working days and all magpies were successfully controlled.

### **Means of achievement**

Respond to landowners wanting to undertake magpie control within 15 working days of receiving a request for information and/or assistance.

### Actual performance

We received 68 calls from landowners in the Wairarapa and 43 in the Western Zone. All calls had response times within 10 working days. All requests for information or assistance are entered onto our database and a phone call or personal visit is made to the complainant within 15 working days. Staff provide advice on best practice trapping techniques to maximise catch results.

GWRC brochures on magpie control are also provided to the public or they are referred to the GWRC website.

## **5.1 Site-Led species – human health – wasps**

**Aim:** To minimise the adverse human health and environmental impacts of wasps at selected sites at a cost of \$2,715

**Annual Cost:** The cost of wasp management to minimise the adverse human health and environmental impacts for the region was \$1,165

### **Means of achievement**

Provide advice and education to occupiers wanting to undertake wasp control.

### Actual performance

Advice on how to treat wasp nests was provided upon request. The public were also encouraged to read information available on the GWRC website.



## Means of achievement

Provide a referral service to landowners/occupiers who require wasp control.

### Actual performance

All members of the public who contacted GWRC were given advice on how to manage problem nests, or referred to the relevant District or City Council, GWRC Parks or DOC staff if nests were on public land. If people were uncomfortable with treating nests themselves, they were referred to a pest control contractor.

A total of 61 wasp nests were reported directly to GWRC.

## 5.2 Wasp season 2012/13

Staff from City and District councils, DOC and GWRC are involved in responding to wasp nest nuisance calls within the Wellington region. All calls have been logged in the 'Wasp Nest Register' since 1990/91 and can be used to summarise wasp nest type, location, time of year and frequency of occurrence.

Monitoring seasonal and annual changes across the region provides a valuable record to help understand wasp population dynamics. The number of calls reported remained relatively static, despite the long dry summer period.

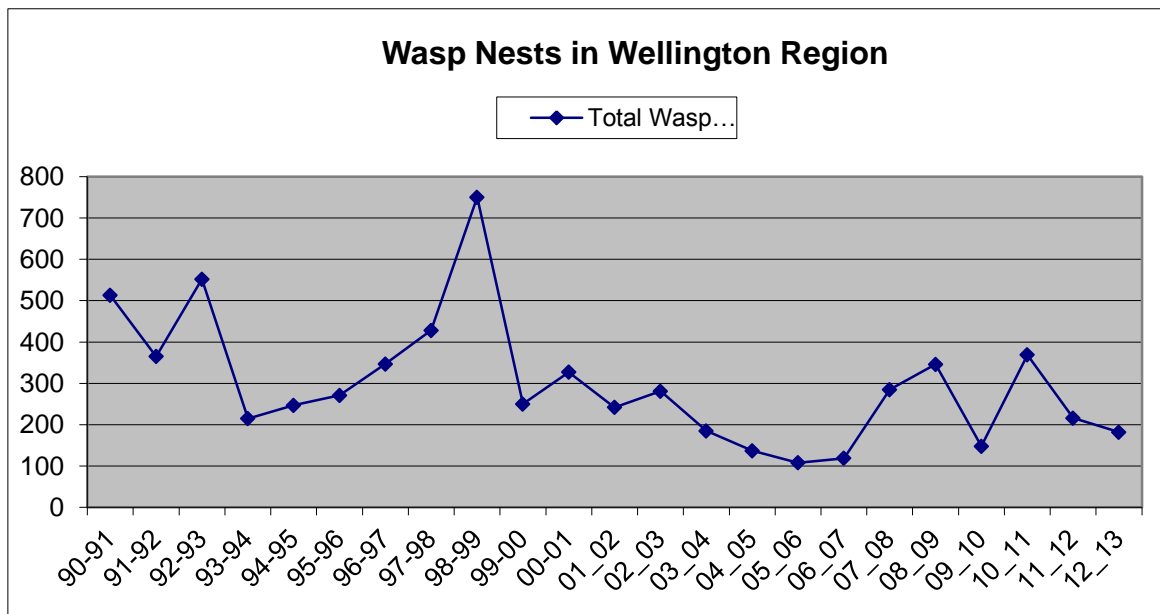


Figure 5. Wasp nuisance nest calls for the Wellington Region

## **6. Site-Led – biodiversity – feral and unwanted cats**

**Aim:** Minimise the biodiversity impact of feral and unwanted cats at a cost of \$6,787

**Annual cost:** The cost for the management and publicity of feral and unwanted cats as a threat to biodiversity was \$7,863

### **Means of achievement**

Provide information and publicity to enhance public awareness of the threat feral and unwanted cats pose to the native fauna of the region.

### Actual performance

Printed and electronic information is available on the threat that feral and unwanted cats pose to the biodiversity of the Wellington region. The GWRC website also has additional information on the management and control of feral and unwanted cats. This information is posted or emailed upon request.

### **Means of achievement**

Undertake direct control of feral and unwanted cats by service delivery as part of the integrated pest management of Key Native Ecosystems (KNE) and other selected sites.

### Actual performance

Feral and unwanted cats are actively managed in 19 KNE sites within the Wellington region (8,527 ha). These sites are predominantly rural as the high number of domestic cats in urban KNE areas may be at risk from current control methods. GWRC also works in conjunction with TA's and private landowners to manage feral and unwanted cat populations. Feral cats are the most persistent predator species under ongoing control, with consistent numbers captured in KNE management sites. Abandoned domestic cats continue to be a problem within the region.

### **Means of achievement**

Provide financial assistance to domestic cat desexing programmes in partnership with select organisations and businesses.

### Actual performance

GWRC provided a limited support for the SPCA led 'adopt-a-pet' programme this year. This programme aims to re-home cats that have been de-sexed to avoid further breeding by unwanted cats in the community.

### **Means of achievement**

Work with communities to remove populations of stray or unwanted cats.

### Actual performance

Individuals who wish to remove feral or stray cats from their own land are given advice on the best type of control strategy or referred to pest management agencies.

GWRC is strongly opposed to the practice of private organisations and individuals trying to maintain colonies of de-sexed cats which are fostered while remaining in the wild. 'Managed' populations encourage support for unmanaged cat populations as well. Both continue to threaten the native wildlife of the region.

## **7. Site-Led – biodiversity – possum**

**Aim:** To minimise the adverse impacts of possums in areas of ecological significance (outside of the KNE programme) and maintain accrued biodiversity and economic gains in the Wellington region at a cost of \$74,656

**Annual cost:** The cost for minimising the adverse impacts of possums in ecologically significant areas and maintaining current biodiversity and economic gains in the Wellington region was \$51,607

### **Means of achievement**

Undertake direct control by service delivery in sites of ecological significance (outside of the KNE programme) in agreement with the landowner/occupier.

### Actual performance

GWRC supported 17 landowners who provide labour for the possum control in covenanted sites mainly located in the Porirua and Kapiti districts.

Biosecurity staff carried out pest animal control in GWRC Regional Parks, many of which are high value sites. This work consisted of ground and aerial pest control for possums, rats, mustelids, goats and pigs. Biosecurity staff also participated in rodent, mustelid and possum control in the GWRC Wainuiomata Mainland Island. This tract of old growth native forest is some of the most valuable lowland rimu-podocarp forest in the North Island.

Biosecurity undertakes a range of cost recovery possum and rat control work outside the KNE programme for local TAs and private landowners.

### **Means of achievement**

Provide a referral or cost recovery service to landowners/occupiers who require possum control.

### Actual Performance

GWRC provides assistance and advice on the management of possums to individual property owners, usually in urban or peri-urban situations.

Assistance is usually with the intent that the occupier can self-manage any future possum problems. Nuisance possums can often be managed in conjunction with or as an extension to our existing possum control areas.

### Means of achievement

Support research initiatives, including biological control.

### Actual performance

Population trend monitoring for possums has been undertaken in Belmont Regional Park since 1994. The aim of the monitoring is to gain an understanding of possum activity at this site in the absence of a control programme. This year the average number of possums active over three fine nights reduced slightly. Since the survey began in 1994 possum activity has fluctuated between an average of 8 to 30 possums counted per line over three fine nights, and appears to be trending slightly up overall from around 14 in 1994 to around 21 in 2012.

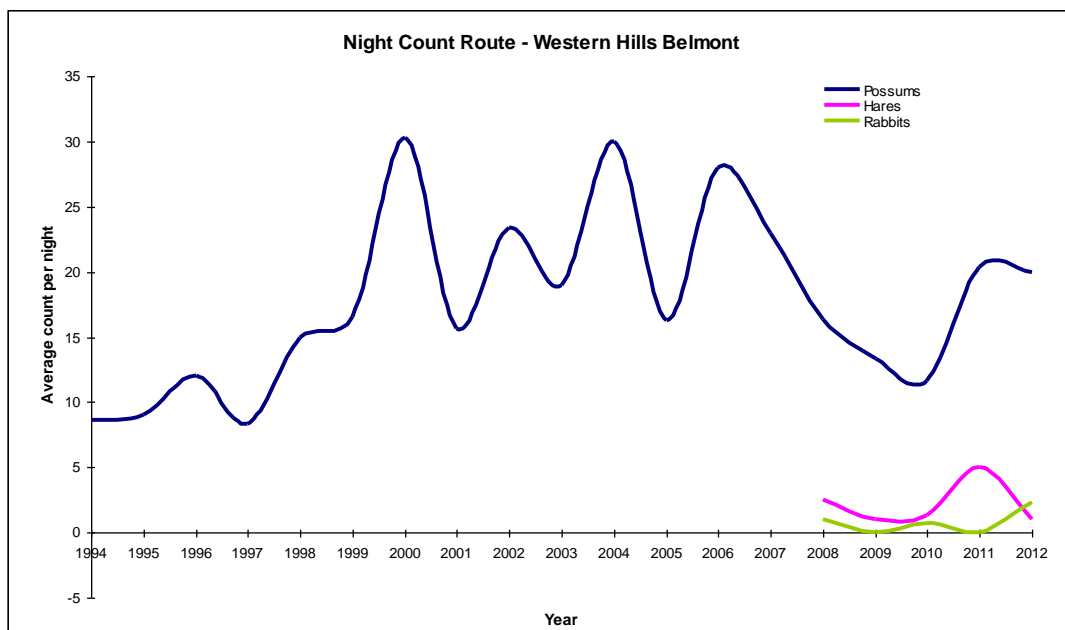


Figure 6. Possum, rabbit and hare night count in Belmont Regional Park

## 8. Pest control research and development

### 8.1 Philproof tunnels

A recent development in predator control is the manufacture of a DOC 250 trap cover which has been designed jointly by Department of Conservation staff and Philproof Products in Hamilton. The cover is a stackable black plastic injection moulded unit designed to aid pest controllers in carrying more units into the field by quad bike or 4WD. They are only suitable for use where no kiwi or weka are present, as there are no baffles to prevent the entry of these birds into the trap. Biosecurity staff have been trialling the covers with the

DOC 250 trap at Pounui Lagoon, South Wairarapa, with encouraging results. Stoats, weasels, ferrets and rats have been caught since their installation.

## 8.2 Good Nature A24 trap trial

A trial of the effectiveness of the Good Nature A24 rat and stoat trap is underway in a small Wellington City Council reserve. The reserve has previously had brodifacoum cereal pellets to control possums and rodents. From September 2012 all toxic baits were removed and 20 A24 traps were installed. Historical monitoring data has shown the toxins have worked well and keep rodent levels to 0% tracking rates for a number of years.

Scheduled monitoring will determine whether there is an increase in the rat population.



Image 1. Good Nature trap

## 8.3 Volunteer involvement in pest animal operations

GWRC has been involved with community groups undertaking pest control for many years. This involvement continued this year with groups participating at 31 different sites and a further 17 private landowners doing their own pest animal control.

## **9. Site-Led – biodiversity species**

### **Feral deer, feral goats, feral pigs, gambusia and koi carp**

**Aim:** To minimise the adverse environmental impacts of the Site-Led – biodiversity species in sites actively managed for ecological health at a cost of \$27,148

**Annual cost:** The annual cost for minimising the environmental impacts of the Site-Led – biodiversity species in special sites was \$21,154

#### **Means of achievement**

Reduce densities of select Site-Led – biodiversity species in KNEs and TA reserves.

#### Actual performance

GWRC Biosecurity assists KNE landowners, GWRC Parks staff and Territorial Authorities with the management of Site-Led biodiversity species when requested.

GWRC staff have undertaken feral goat control in several urban sites where animals were damaging public and private property adjacent to KNE, Regional Park or reserve areas. Problems often occur where residential properties border on to large tracts of reserve or farmland where feral goats or feral pigs are present.

Pig trapping has worked successfully in areas where hunting with dogs would be too disruptive or potentially hazardous. Several traps were loaned to private landowners in the 2012-13 year.

### **9.1 Drought effects on feral deer**

With the feral deer population increasing in the region, landowners are starting to report greater impacts. Feral deer were reported raiding crops in the Wairarapa hill country because of a shortage of grass growth during the drought. Feed shortfalls force deer to increase browsing pressure on native bush and agricultural crops alike.

## **10. Site-Led Mt Bruce (Pukaha) predator buffer**

**Aim:** Complement the native flora and fauna restoration programme undertaken by the Department of Conservation (DOC), Rangitane o Wairarapa and the National Wildlife Trust at the Mount Bruce Scenic Reserve at a cost of \$38,007.

**Annual Cost:** The cost for the predator control programme within the buffer for the 2012/13 financial year was \$40,335.

The main objective of the Pukaha predator buffer is to reduce and maintain all predator numbers at very low levels within the buffer area, and to reduce re-infestation by predators of the Mt Bruce Reserve. These control operations benefit a wide range of flora and fauna within the reserve. The focus is

particularly on helping the reintroduced endangered native bird species such as kaka, kokako and kiwi to live and breed with a reduced threat of predation. The predator species targeted for control are possums, cats, ferrets, stoats, weasels, hedgehogs and rats.

Control is undertaken by kill-trapping and laying toxic baits in bait stations. The servicing of all equipment within the 2,200 hectare Pukaha predator control buffer was carried out by GWRC staff. Servicing occurred regularly at monthly intervals, with reports of kills and bait-take supplied after each service round. Trapping accounted for 72 feral cats, 12 ferrets, five stoats, 270 hedgehogs and 207 rats during the 2012/13 servicing year. A further unknown number of possums and rats were controlled with the 88kg of brodifacoum bait used.

## **11. Site-Led - Key Native Ecosystems, Reserves and Forest Health**

**Aim:** To protect indigenous biodiversity in a comprehensive selection of Key Native Ecosystems and reserves at a cost of \$1,872,112

**Annual Cost:** The cost to achieve a measurable improvement in the ecological health and diversity of Key Native Ecosystems and reserves through pest animal control was \$1,816,584

### **Means of achievement**

Ensure KNEs are legally protected into perpetuity.

#### Actual performance

All of the KNEs treated during 2012/13 were legally protected. They included Territorial Authority Reserves, QEII covenants, or contained legally protected sites within the management area.

### **Means of achievement**

Establish and implement integrated pest management plans for all KNEs and selected Reserves.

#### Actual performance

Integrated management plans for all KNE areas and Reserves are currently being reviewed and rewritten by the GWRC Biodiversity Department.

### **Means of achievement**

Undertake direct control by service delivery of pests identified in the management plan for each KNE.

#### Actual performance

During the 2012/13 year, possum and predator work was undertaken over 64,660 ha. This comprised 17 sites in the Wairarapa (7,789 ha) and 99 sites (56,870 ha) in the Western Zone (Figure 7).

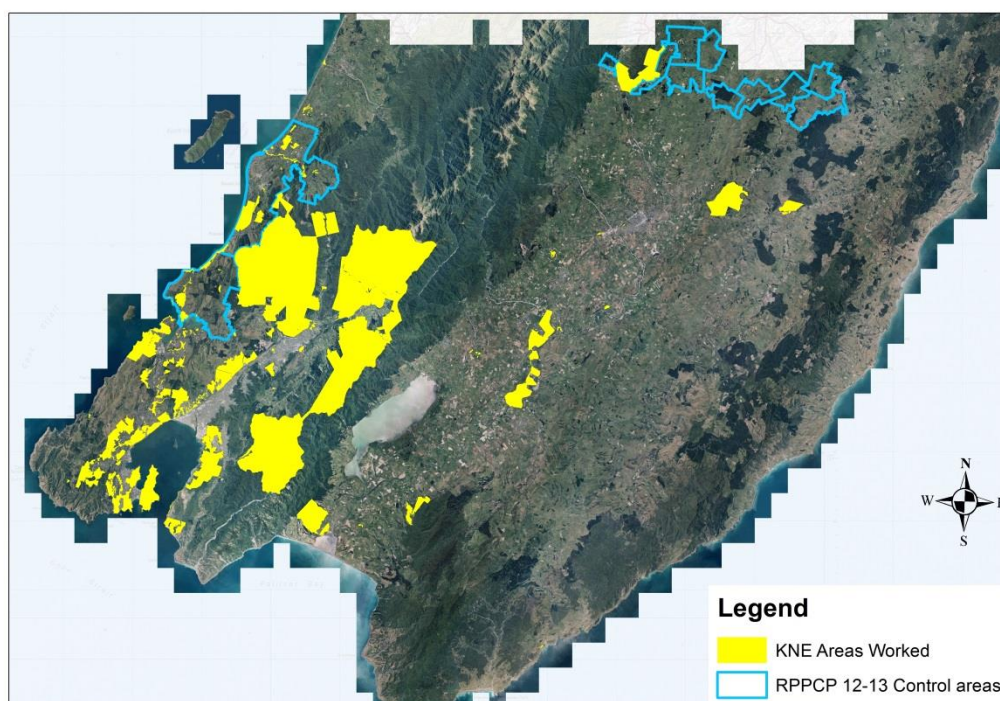


Figure 7. Possum and pest animal control in Wellington Region – KNE and RPPCP

### **Means of achievement**

Facilitate the involvement of community groups, where appropriate.

#### Actual performance

GWRC has been involved with community groups undertaking pest control for many years. This involvement continued this year with groups participating at 31 different sites and a further 17 private landowners doing their own control.

### **Means of achievement**

Coordinate site management with other biodiversity initiatives, where possible.

#### Actual performance

Pest animal and plant control is undertaken with Care and Friends group volunteers to assist them to achieve a range of biodiversity based objectives. This continues in a wide range of TA reserves and KNEs across the region.

### **Means of achievement**

Monitor site recovery using a range of ecological indicators.

#### Actual performance

Methods for the effective monitoring of site recovery are the subject of national research efforts. Regional councils, DOC, Ministry for the Environment and



science providers are developing a model that will enable nationally consistent and affordable reporting on biodiversity and ecosystem services and condition.

Monitoring will be conducted and reported by the GWRC Environmental Science department in the State of Environment reports.

### 11.1 Rodent monitoring in Key Native Ecosystems

Rodent monitoring has been completed in nine Key Native Ecosystems (KNE's) this year (Figure 8). This on-going monitoring is carried out twice a year, in February and August. The monitoring is undertaken to inform pest control managers of the efficacy of the multi-species pest control regime for rats.

The baiting regime in the KNE sites continues to maintain the rat population below 5% in most of the reserves. Five of the reserves did not show any rat activity in the August monitor. Johnsonville Park was the only site where the rat tracking index exceeded 5%, with the tracking index recorded at 15%.

Long Gully was the only KNE site where possums were detected during monitoring. This is expected due to the large residual possum population outside the control area.

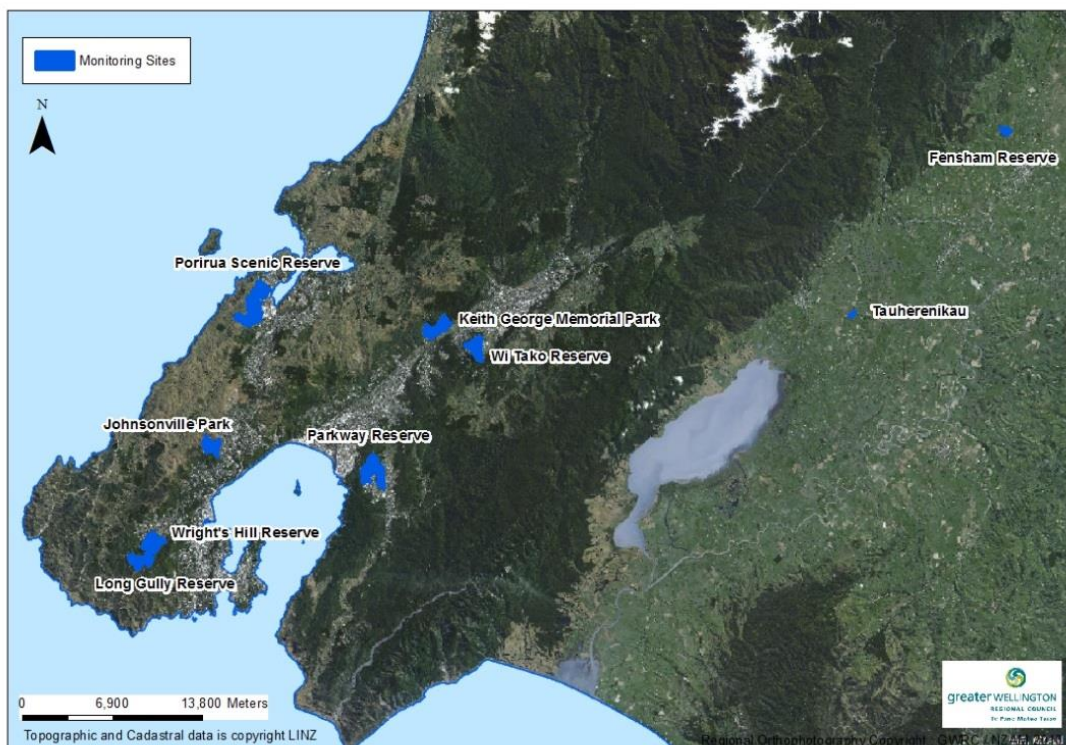


Figure 8. Rodent Monitoring Sites in the Wellington Region

**Means of achievement**

Provide public education and advice to foster biodiversity management outside formal KNE programme areas.

Actual performance

During the year Biosecurity staff worked with groups and individuals interested in preserving native biodiversity and provided information and advice on pest animal management.

**Means of achievement**

Maintain holistic management in existing KNE areas.

Actual performance

Integrated pest management targeting possums, rodents and/or other predators were maintained in all KNE sites and some other high biodiversity value areas. With available resources, priority was given to maintaining existing programmes, rather than taking on new works. Most areas were maintained on a three monthly cycle by GWRC staff or service providers.

**Means of achievement**

Where KNEs are identified on TA land, seek funding from the relevant authority to form financial partnerships.

Actual performance

GWRC maintains a good working relationship with all of the regional TAs, including a number of shared funding agreements for pest management. Memorandum of Understanding (MOU) provides a formal platform for this relationship. The MOU is prepared and agreed annually between GWRC and the Western Zone TA's. The parties agree to support biodiversity and optimise ecological health within the relevant territories.

The MOU programme is facilitated by the Biodiversity Department. Formal pest management programmes with Wellington, Lower Hutt, Upper Hutt and Porirua City Councils and with the Kapiti Coast District Council continued during the 2012/13 year. The direct costs for work undertaken on their land are generally equally shared between GW and the local authority.

## **12. Site-Led – Regional Possum and Predator Control Programme**

**Aim:** To minimise the adverse impacts of possums in areas declared Bovine Tb free or in areas which are outside of the Tb Free New Zealand programme at a cost of \$431,400

**Annual cost:** The cost for minimising the adverse impacts of possums in areas declared bovine Tb free or in areas outside of the Tb Free New Zealand programme in the Wellington region was \$458,900

### **Means of achievement**

- (i) Address the adverse impacts of possums in bovine Tb free areas for catchment functions, biodiversity and economic prosperity.
- (ii) Maintain a possum residual trap catch (RTC) of 5% or lower across the 15,500 ha of the Wellington region which has been declared bovine Tb free.
- (iii) Commence possum control in areas not included within the Tb Free New Zealand programme.

### Actual performance

The Regional Possum and Predator Control Programme (RPPCP) for the Wellington region commenced in the northern Wairarapa in 2010/11 and moved into the Kapiti District during 2012/13 (Figure 7).

Control was undertaken within 15,500 hectares of northern Wairarapa and included maintenance and re-baiting of all permanent bait stations.

Initial control began in 11,500 hectares of the Kapiti district. Setting up this operation was complex and time consuming due to the smaller property sizes and large number of landowners to liaise with.

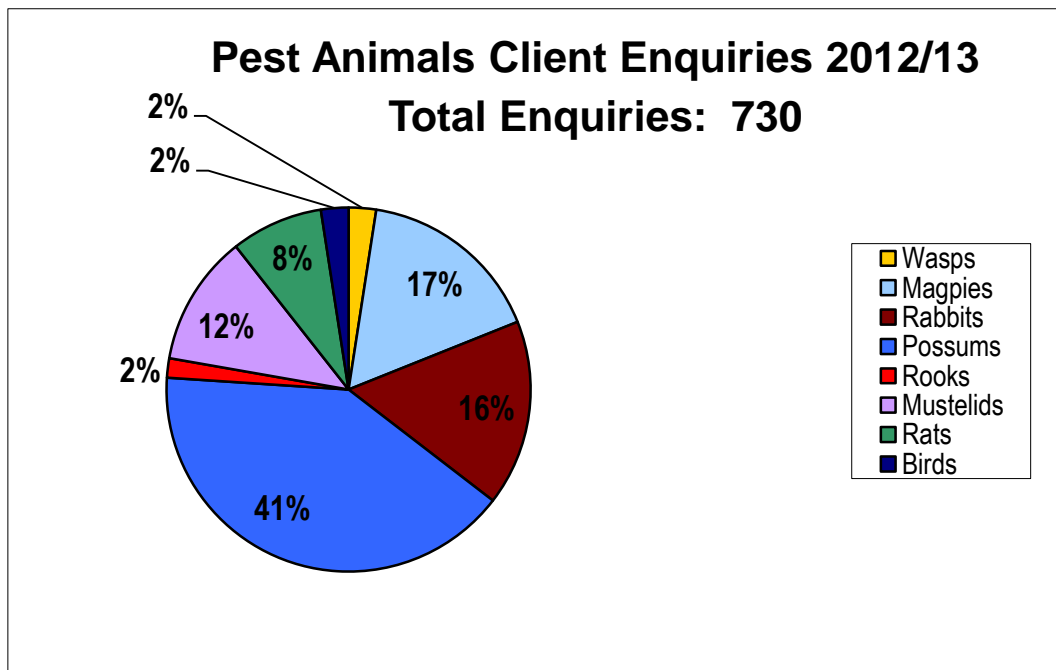
Pre-operation planning and works commenced within the Porirua City boundary over 7,700 hectares.

### 13. Client enquiries 2012/13

**Total enquiries: 730**

The proficient servicing of clients is a significant focus of the Operational Plan. To ensure effective and timely action a client response database is maintained. The database holds historical information on an area or pest and enables GWRC to manage responses efficiently, to plan the level of control required, and to assess the effectiveness of control methods.

730 public pest animal related enquires were processed during the year. More possum enquires were received than in recent years, with many prompted by changes to the Tb Free possum control programme in the region.



### 14. Financial summary

The year end result for pest animal management under the RPMS was an operating surplus of \$67,900.

	\$ (000's)
Rates and Levies	1,287.2
External Revenue	50.4
Internal Revenue	1,287.1
<b>Total Operating Revenue</b>	<b>2,624.7</b>
<b>Total Direct Expenditure</b>	<b>2,023.4</b>
Overheads	533.3
<b>Total Operating Expenditure</b>	<b>2,556.7</b>
Surplus	68.0

## Part Two

### Pest Plants

#### 15. Species led programmes

##### 15.1 Surveillance species

**Aim:** To determine the distribution and means of control for Regional Surveillance pest plants within the Wellington region at a cost of \$210,917

**Annual cost:** The cost of managing Surveillance plants throughout the region during 2012/13 was \$264,241

##### Means of achievement

Identify new sites of Surveillance pest plants by Biosecurity staff, the public, or through the Surveillance pest plant programme.

##### Actual performance

Total Control surveys and passive surveillance registered six new Surveillance species sites this year. Delimiting surveys around current known sites will be necessary to establish the full extent of Surveillance species distribution in the region.

Table 2. Surveillance species records for the Wellington region

Surveillance species records		
Plant Type Name	TA	No. of Infested Sites
African fountain grass	Kapiti Coast	1
	South Wairarapa	1
		<b>2</b>
Asiatic knotweed	Lower Hutt	1
	South Wairarapa	1
	Upper Hutt	1
	Wellington	27
		<b>30</b>
Australian sedge	Kapiti Coast	1
		<b>1</b>
Bomarea	Lower Hutt	23
	Kapiti Coast	6
	Wellington City	21
	Upper Hutt	1
		<b>51</b>
Chilean flame creeper	Carterton	2
	Masterton	1
	Upper Hutt City	4
		<b>7</b>

Surveillance species records		
Plant Type Name	TA	No. of Infested Sites
Chocolate vine	Carterton	25
	Lower Hutt	23
	Kapiti	28
	Masterton	29
	Porirua	4
	South Wairarapa	18
	Upper Hutt	29
	Wellington	33
	<b>189</b>	
Nassella tussock	Kapiti Coast	2
	Porirua	1
		<b>3</b>
Purple loosestrife	Carterton	1
	Kapiti Coast	11
	Masterton	2
		<b>14</b>
Senegal tea	Kapiti Coast	9
	Upper Hutt	1
		<b>10</b>
Spartina	Lower Hutt	2
	South Wairarapa	1
		<b>3</b>
White edged nightshade	Carterton	2
	Masterton	1
		<b>3</b>
<b>Total:</b>		<b>313</b>

One new species for the Wellington region, viscid nightshade (Image 2), was discovered following a public enquiry. A vigilant landowner noticed an unusual plant in a freshly sown grass paddock on his property and contacted GWRC. Landcare Research identified the plant as viscid nightshade (*Solanum sisymbriifolium*).



Image 2. Viscid nightshade - *Solanum sisymbriifolium*

### **Means of achievement**

Undertake a control trial programme on selected Regional Surveillance pest plants within the region.

#### Actual performance

Control trials were undertaken on a number of Surveillance species within the region including Asiatic knot weed, bomarea, arum lily, purple loosestrife, Senegal tea, hieracium species, Himalayan balsam, gazania and field horsetail. The results of these trials will assist with making informed decisions on future management of the targeted species.

Trials to control field horsetail (*Equisetum arvense*) showed that there are no control options that would not cause substantial collateral damage to cropping, pasture or indigenous species at the control site. This species is now targeted for biological control assessment and education work that will aim to raise public awareness of the ease at which this species is spread on agricultural and earth works machinery and by moving infested gravel.

### **Means of achievement**

Use biological control agents where appropriate, and support relevant biological control research initiatives.

#### Actual performance

GWRC, as part of the National Biocontrol Collective, is currently funding research into biocontrol agents for nassella tussock, Chilean needle grass and alligator weed. There is a strong interest among the Lower North Island partnership agencies to include field horsetail on the list of priority species for biocontrol research.



Image 3. Field horsetail dominance in sown pasture

### **Means of achievement**

Provide information and publicity to enhance public awareness of the threat posed by Surveillance species to the region.

#### Actual performance

Biosecurity staff produced regular media releases and articles in the GWRC publication 'Our Region' and local media on a number of Surveillance species, including Himalayan balsam and white edged nightshade, and information on the 'Check Clean Dry' programme.

MPI continued funding of the Check Clean Dry summer programme for the fifth consecutive year. The aim of the programme is to raise public awareness of didymo and other freshwater pest species. The work was coordinated with DOC to ensure the most efficient use of resources in the region. Staff engaged with the public by targeting high use areas of our rivers, attending specialist outdoor events, distributing information to relevant outdoor sports and recreational businesses, organisations and clubs, and by releasing information to the media.

## **15.2 Total Control species**

**Aim:** To control all Total Control species within the Wellington region at a cost of \$318,556

**Annual cost:** The cost of managing Total Control plants throughout the region during 2012/13 was \$219,480

### **Means of achievement**

- (i) Identify new sites of Total Control species through incidental reports by GWRC staff, the public, or through the Regional Surveillance pest plant programme.

#### Actual performance

Delimiting survey activity for Total Control species was limited in 2012/13 to 780 properties. Letterbox drops were undertaken in areas that were not surveyed to raise the awareness of the targeted species. Surveys and public reports resulted in 35 new Total Control sites; two African feather grass, two Bathurst bur, 10 blue passion flower, two climbing spindleberry, five moth plant, four perennial nettle and 15 woolly nightshade.

### **Means of achievement**

- (ii) Undertake direct control by service delivery of all Total Control species at all known sites with the region on an annual basis.

#### Actual performance

The Total Control programme has made significant progress on the majority of species with the exception of Madeira vine and Bathurst bur. This year, across



all 11 Total Control species, 29 sites were free from the targeted species for sufficient time to warrant a change of status from ‘monitored’ to ‘eradicated’ and 64 sites were changed from ‘active’ to ‘monitored’ (Figures 9 and 10). The results for the individual species are presented in Appendix 1.

All 1,347 known Total Control sites were inspected and controlled during the year. Some sites are required to be visited up to five times annually depending on the reproductive ability of the targeted species and seasonal weather (e.g. Bathurst bur and saffron thistle). Others were only visited once prior to seed set (e.g. blue passion flower and moth plant).

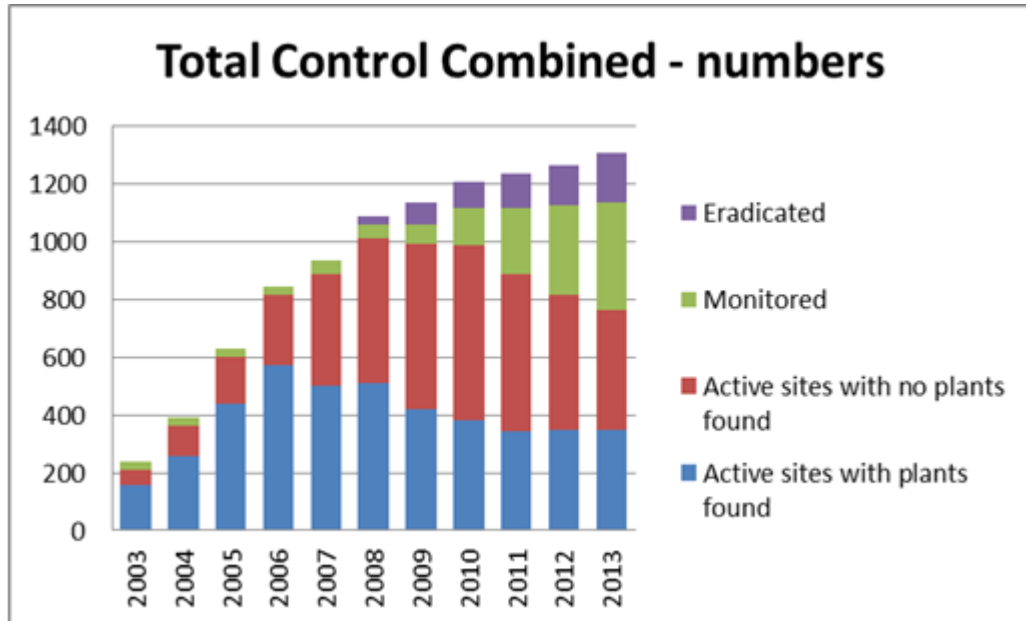


Figure 9. Total Control species sites combined (number of sites)

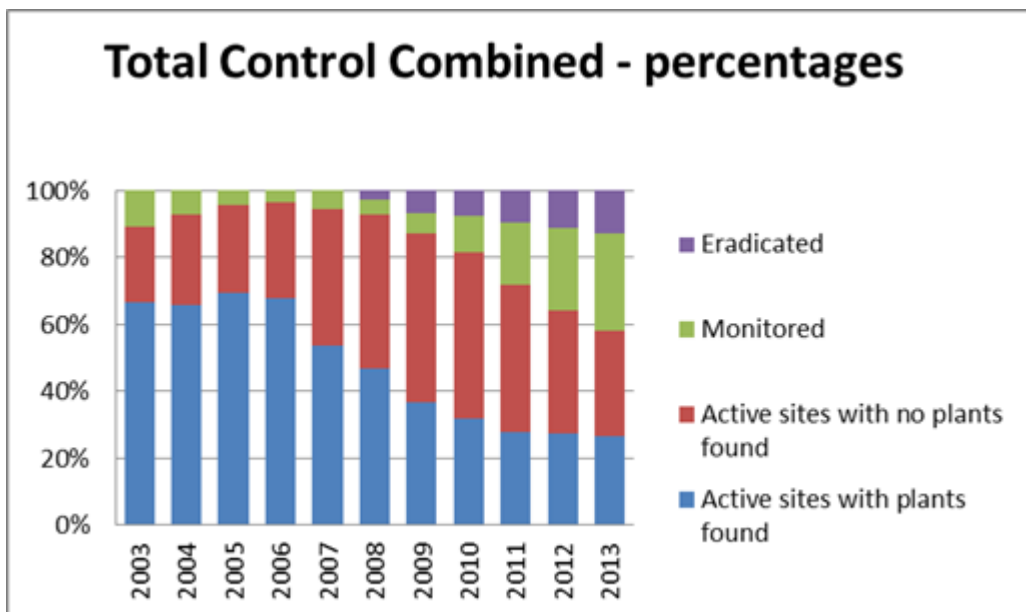


Figure 10. Total Control species combined sites (%)

Madeira vine control and site inspections were abandoned due to a lack of effective control options. The sites are located on steep inaccessible areas predominantly in urban locations. The vines produce masses of buried corns

which are difficult to locate beneath the vines. These plants are also grown for cultural and medicinal values and a number of property owners were not supportive of control.

Bathurst bur is a serious economic risk to pastoral properties. Two new incursions were located on rural properties where changed land use from pastoral dry stock to cropping released a dormant seed bank and encouraged mass germination. One new property near Martinborough was used in the past to wash down waste from stock trucks. This is an indication that stock carrying seed have moved from infested properties to other sites in the region.

### **MPI National Interest Pest Response Programme (NIPR)**

GWRC is part of the MPI led national initiative to eradicate Manchurian wild rice (MWR) and cape tulip from New Zealand. GWRC staff deliver plant control management under MPI funding.

There is a single MWR infested site in the region at Waikanae. The MWR control program has been underway for 15 years and part of NIPR since 2006. Following good progress for several years MPI agreed to intensify the eradication effort and increase funding.



Image 4. Stakes showing scattered Manchurian Wild Rice infestations throughout the infestation site.

Biosecurity staff inspected all known cape tulip sites and found plants at only two of the five sites. In collaboration with MPI, staff are looking to remove the entire soil profile and shrub areas from the two infested properties to eradicate this species from the region.

### **Means of achievement**

Annually inspect all plant outlets and markets within the region for the sale and/or propagation of Total Control species.

### Actual performance

Please refer to Section 20 National Pest Plant Accord.

### **Means of achievement**

Use biological control agents where appropriate, and support relevant biological control research initiatives.

### Actual performance

GWRC, as part of the National Biocontrol Collective, is currently funding research on biocontrol agents for woolly nightshade and moth plant, which are on the list of priorities for biocontrol research nationally. The woolly nightshade lace bug was released in 2010, and research is continuing on other agents.

Attempts are being made to collect and culture a rust for moth plant. If host testing is successful an application will be put forward to the Environmental Protection Authority (EPA) for approval to mass rear and release the rust into the wild. A moth plant seed fruit fly is also being investigated.

A feasibility study has been conducted on biocontrol for Manchurian wild rice and results were very favourable. The natural enemies of rice species are well known due to the plants commercial value and several host specific insect agents appear promising.

## **15.3 Containment species**

**Aim: To control all Containment species outside the Containment zones within the Wellington region at a cost of \$253,172**

**Annual cost: The cost of managing Containment plants throughout the region during 2012/13 was \$227,497**

### **Means of achievement**

Undertake direct control by service delivery of Containment species outside the Containment zone within the region on an annual basis.

### Actual Performance

Biosecurity staff inspected and controlled all known Boneseed sites outside of the containment zone. Staff have made considerable progress in containing this significant pest of coastal escarpments (Figure 11), working in difficult terrain and under demanding conditions (Image 5). Control sites were located in coastal Wairarapa, Titahi Bay and the Wellington south coast.





Image 5. Helicopter Boneseed control at Ngawi.

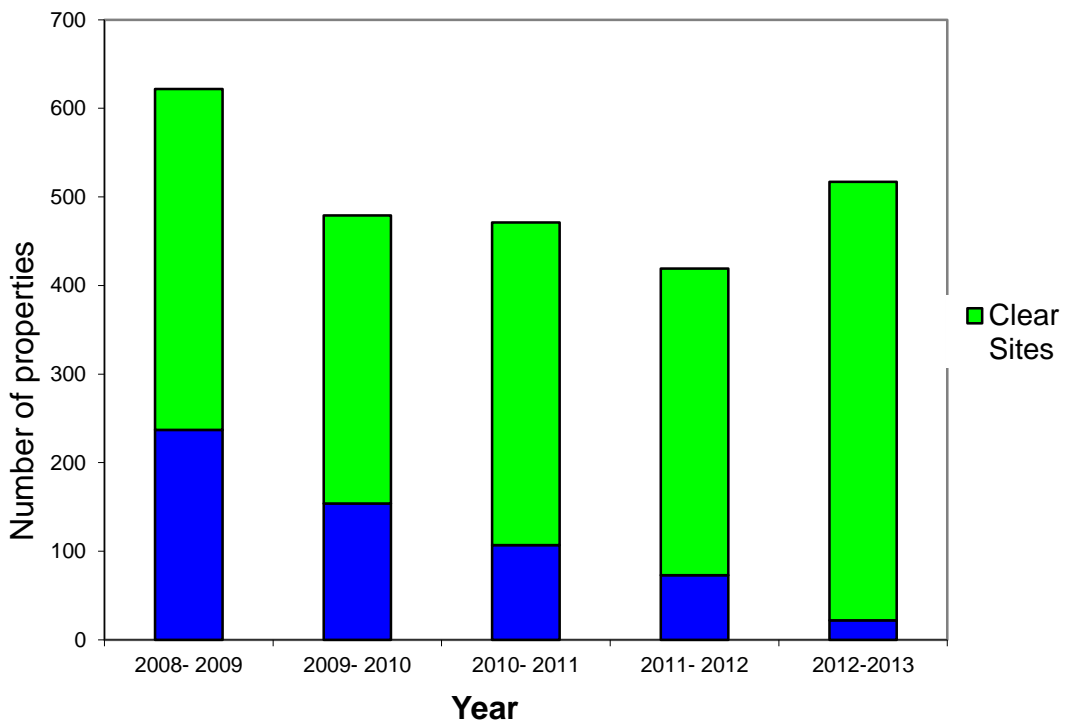


Figure 11. Boneseed sites (active sites in blue)

All known sites infested with sweet pea shrub and evergreen buckthorn were controlled outside the containment areas.

**Means of achievement**

Provide information and publicity to enhance public awareness of the threat posed by the Containment species to the region.

### Actual performance

As part of the Wairarapa Moana Wetland Project, Biosecurity have developed the 'Aquatic Pest Plant Identification and Control Guide' in collaboration with NIWA to help the landowners around the lake manage nuisance aquatic pest plant species such as hornwort.

### **Means of achievement**

- (iii) Identify new sites of Containment species outside the Containment zones through incidental reports by Biosecurity staff, the public, or through the Regional Surveillance pest plant programme.

### Actual performance

Evergreen buckthorn plants were identified and controlled on a number of Kapiti dune restoration sites.

### **Means of achievement**

- (iv) Annually inspect all plant, animal outlets and markets in the region for the sale and/or propagation of the Containment species.

### Actual performance

Aquariums in pet shops are inspected for aquatic pest species annually. Please refer to Section 20 NPPA inspections for more information.

### **Means of achievement**

- (v) Use biological control agents where appropriate, and support relevant biological control research initiatives.

### Actual performance

The National Biocontrol Collective formed a working group to focus on aquatic pest plant species. Hornwort was ranked as one of the top five priority species for biological control. GWRC contributed funding towards the feasibility study for hornwort, egeria and lagarosiphon control completed by NIWA during the year.

The boneseed leafroller caterpillar has been released in previous years within the Wellington and Porirua coastal escarpments but failed to establish due to predation by ants and wasps. The National Biocontrol Collective continues the search for other biological control agents against Boneseed. Seed weevils and rust pathogens are the current focus of the research.

#### **15.4 Site-Led boundary control, suppression and human health species**

**Aim:** To minimise the adverse impacts of Site-led boundary control species and the risk to human health of species in specific situations throughout the Wellington region at a cost of \$276,462

**Annual cost:** The cost of managing Site-led boundary control plants throughout the region during 2012/13 was \$212,727

##### **Means of achievement**

Action complaints received to comply with the RPMS rules.

##### Actual performance

Staff responded to all 186 complaints and public requests for inspections this year. Direct compliance action by GWRC staff is the most cost effective way to deal with the majority of these complaints.

##### **Means of achievement**

Use biological control agents where appropriate, and support relevant biological control research initiatives.

##### Actual performance

The National Biocontrol Collective is supporting research on a number of Site-Led species including banana passionfruit, wild ginger and nodding thistle.

Landcare Research trials are underway on host specificity of a foliage-feeding moth (*Pyrausta perelegans*) and a stem-boring moth (*Odonna passiflorae*) for banana passionfruit. Host testing is progressing for the wild ginger weevil and fruit fly biocontrol agents.

#### **15.5 Site-Led – Key Native Ecosystems, Reserves and Forest Health**

**Aim:** To protect indigenous biodiversity in a comprehensive selection of Key Native Ecosystems and Reserves at a cost of \$857,393

**Annual cost:** The cost to GW to manage KNE species was \$960,650

##### **Means of achievement**

Ensure KNEs are legally protected into perpetuity.

##### Actual performance

All sites currently receiving restoration activity by Biosecurity are either covenants registered with QEII or are Reserves owned by TAs'.

##### **Means of achievement**

Establish and implement integrated pest management plans for all KNEs and selected Reserves.

### Actual performance

Integrated management plans for KNE areas and reserves are currently being reviewed by the Biodiversity Department, in conjunction with Biosecurity staff.

### **Means of achievement**

Undertake direct control by service delivery of pests identified in the management plan for KNEs and Reserves.

### Actual Performance

Pest plant control work was undertaken in 85 KNE sites for a range of pest plants. Work was carried out collaboratively with TAs' and DOC as agreed in the annual Memorandum of Understanding agreements.

### **Means of achievement**

Co-ordinate site management with other biodiversity initiatives where possible.

### Actual performance

Biosecurity pest plant team assisted DOC with hornwort control at Boggy Pond adjacent to Lake Wairarapa.

### **Means of achievement**

Monitor site recovery using a range of ecological indicators.

### Actual performance

Methods for the effective monitoring of control site recovery are the subject of national research efforts. Regional councils, DOC, Ministry for the Environment and science providers are developing a model that will enable nationally consistent and affordable reporting on biodiversity and ecosystem services and condition.

Monitoring will be conducted and reported by the GWRC Environmental Science department in the State of Environment reports.

### **Means of achievement**

Manage external pressures that are inconsistent with KNE and reserve management objectives.

### Actual performance

GWRC made all reasonable efforts to mitigate threats to restoration areas such as livestock access, rubbish and garden waste dumping, boundary encroachment and pest animal incursions. Efforts are made to raise awareness on such issues and referrals are made to relevant external parties when necessary.



### **Means of achievement**

Provide public education and advice to foster biodiversity management outside formal KNE and reserve areas. Provide information and publicity to enhance public awareness of the threat posed by Regional Surveillance, Total Control, Containment, Site-Led and Environmental pest plants to the region.

#### Actual performance

GWRC maintains a published and web based resource on effective pest management and restoration activities. Staff readily provide advice to individuals, groups and organisation with an interest in pest management and biodiversity activities.

### **Means of achievement**

Where KNEs are identified on TA land, seek funding from the relevant authority to form financial partnerships.

#### Actual performance

Funding agreements were maintained with all Territorial Authorities.

## **16. Biological control**

Staff worked with 14 different species of biocontrol agents during the year. The work included releasing and transferring agents, and monitoring their establishment and spread.

GWRC was the lead agency in seeking approval to import biocontrol agents for Japanese honeysuckle on behalf of the National Biocontrol Collective. The application was successful and EPA granted approval for the release of Honshu white admiral butterfly (*Limenitis glorifica*) as a biological control agent for Japanese honeysuckle. The first release is scheduled for the Wellington region in late 2014.

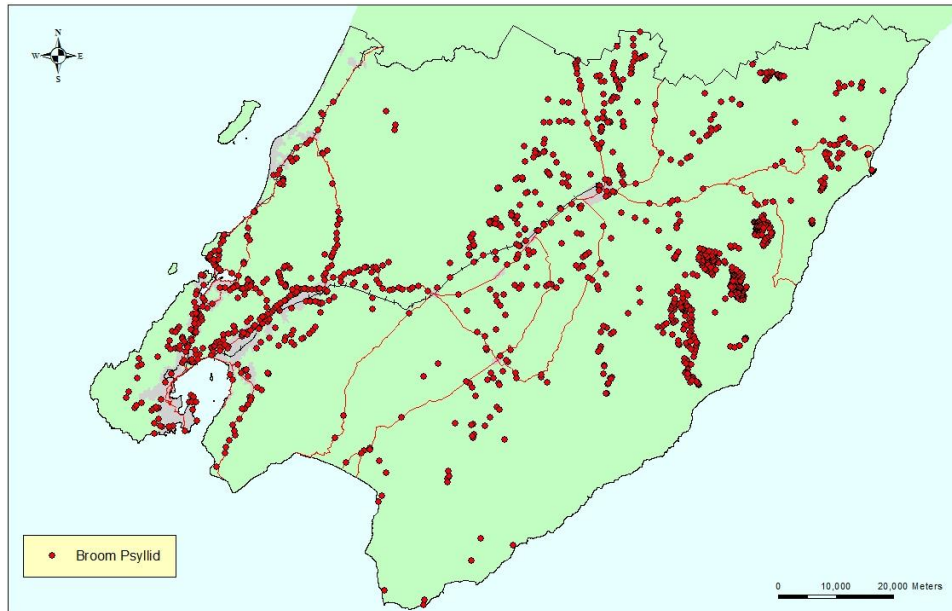
A total of 1,231 biocontrol agent releases have been completed within the Wellington region since the start of the biocontrol programme in 1988. Most of the agents are well established and widespread across the region (see Appendix 2).

### **16.1 Releases**

A number of sites were targeted with the release of biocontrol agents supplied by LCR during the year. These consisted of 10 broom gall mite, two broom leaf beetle, one tradescantia leaf beetle, four tradescantia tip beetle and one tradescantia stem beetle release. Wellington City Council also purchased and managed two releases of the tradescantia stem beetle. There is now a full complement of tradescantia beetles in the region which attack different parts of the plant.

## 16.2 Transfers

In 2012/2013 an intensive effort was made to transfer broom psyllid (*Arytainilla spartiophila*) throughout the Western zone of the region (Figure 12). 345 broom sites were inspected throughout the region, with transfers made to 293 which did not have broom psyllid present. Broom psyllid is now distributed throughout the Wellington region.



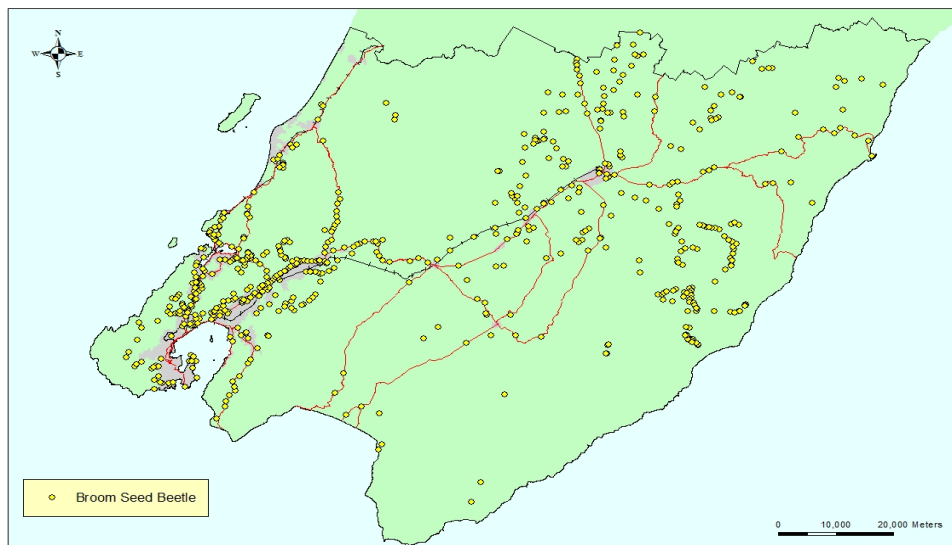
Total broom psyllid (*Arytainilla spartiophila*) coverage 2013

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Figure 12. Broom psyllid distribution in the Wellington region

While transfers were being made on broom psyllid, presence/absence monitoring was also undertaken for the broom seed beetle (*Bruchidius villosus*) and most, if not all, psyllid releases also contained broom seed beetle. This agent is confirmed to have spread throughout the region and no further transfer work is required (Figure 13).



Total broom seed beetle (*Bruchidius villosus*) coverage 2013

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Figure 13. Broom seed beetle distribution in the Wellington region

Eleven transfers of the buddleia leaf weevil (*Cleopus japonicus*) were made and buddleia sites were recorded throughout the region for further future transfers.

Trials were undertaken to establish how many broom mite galls are needed for a successful transfer. This information will assist with future establishment programmes.



Image 6. Galls on broom (Source: The Biocontrol of Weeds Book, Landcare Research)

### 16.3 Monitoring

Monitoring of the impacts of biocontrol agents is seen as a significant factor for determining the effectiveness of control, and gathering public support for future biocontrol activity.

Biosecurity staff continued to monitor the impacts of the buddleia leaf weevil at three different sites. It is too soon for the data to reveal any trends but damage has been obvious at all of the study sites. Reports from around the country are consistently positive. The buddleia leaf weevil is considered a promising and successful agent.

Base line monitoring (or pre-impact) measurements were conducted for the tradescantia tip and leaf beetles in the 2011-2012 year and establishment has been confirmed. Further impact monitoring was not conducted this year as the numbers of the beetles are not yet considered sufficient enough.

Monitoring of the new ragwort plume moth (*Platyptilia isodactyla*) released in March 2012 confirmed establishment in the eastern zone of the region. Samples were sent to Landcare Research for positive identification. In the

western zone only the native blue stem borer moth was found. Monitoring will continue at both sites.

Distribution monitoring was conducted on gorse thrips (*Sericothrips staphylinus*) in the western zone and it was found to be widely distributed throughout the area (Figure 14).

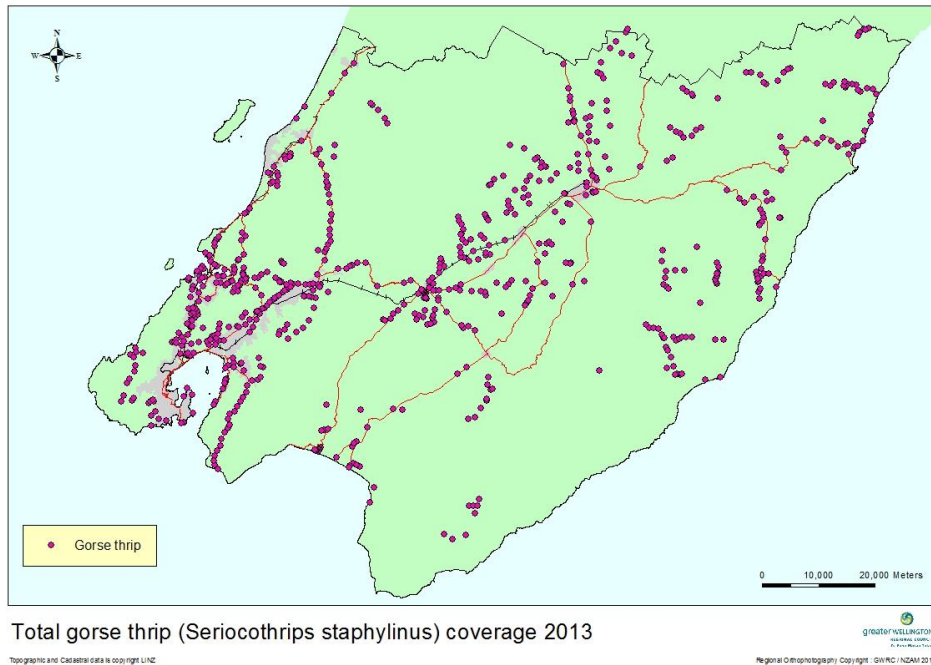


Figure 14. Gorse thrip distribution in the Wellington region

#### 16.4 Dung beetles

GWRC contributed towards field trials on several species of dung beetles completed by Landcare Research and the Dung Beetle Release Strategy Group (DBRSG). The trials showed that dung beetles are likely to provide significant benefits to New Zealand pastoral systems. A field release of two species was made on an organic sheep and beef property in the Wairarapa in October 2013. The owners of the property are part of a collective group of 12 landowners in the Wairarapa who are prepared to contribute financially towards releases on their properties.

#### 17. 'Plant Me Instead' Booklet

GWRC worked with Weedbusters, DoC and Wellington City Council to produce a regional *Plant Me Instead* booklet. Booklets had previously been produced for many of the regions in New Zealand and are aimed at raising awareness about the weeds of greatest concern in a particular area of the country and what native plant alternatives are available for home gardens.

Copies of the booklet will be available to the public through GWRC.

## **18. Reassessment of selected agrichemical for use over water**

A consortium of regional councils including GWRC, DOC, MPI and several power companies worked collectively on a project to review the use of a suite of agrichemicals on emergent aquatic pest plant species. The group applied for the reassessment of their use with EPA. Permission was granted to use Escort, Galant, Grazon and Garlon herbicides. This will enable more effective control of pest plant species emerging from or adjacent to water. Future control of spartina, Manchurian wild rice and many other aquatic pest plants will benefit from the use of these chemicals.

The National Group is now collaborating on monitoring outcomes and developing a set of national templates to ensure uniform compliance to the conditions EPA imposed. A set of best practice guidelines for the approved chemicals will be developed as part of the collaboration.

## **19. Land Resources Support System**

GWRC staff completed a project with Bay of Plenty Regional Council developing user requirements and processes for an integrated catchment data management system. The requirements cover all land and enquiry based activity for Biosecurity, Biodiversity, Land Management and Environmental Science. The project can now move towards the development stage.

## **20. National Pest Plant Accord (NPPA)**

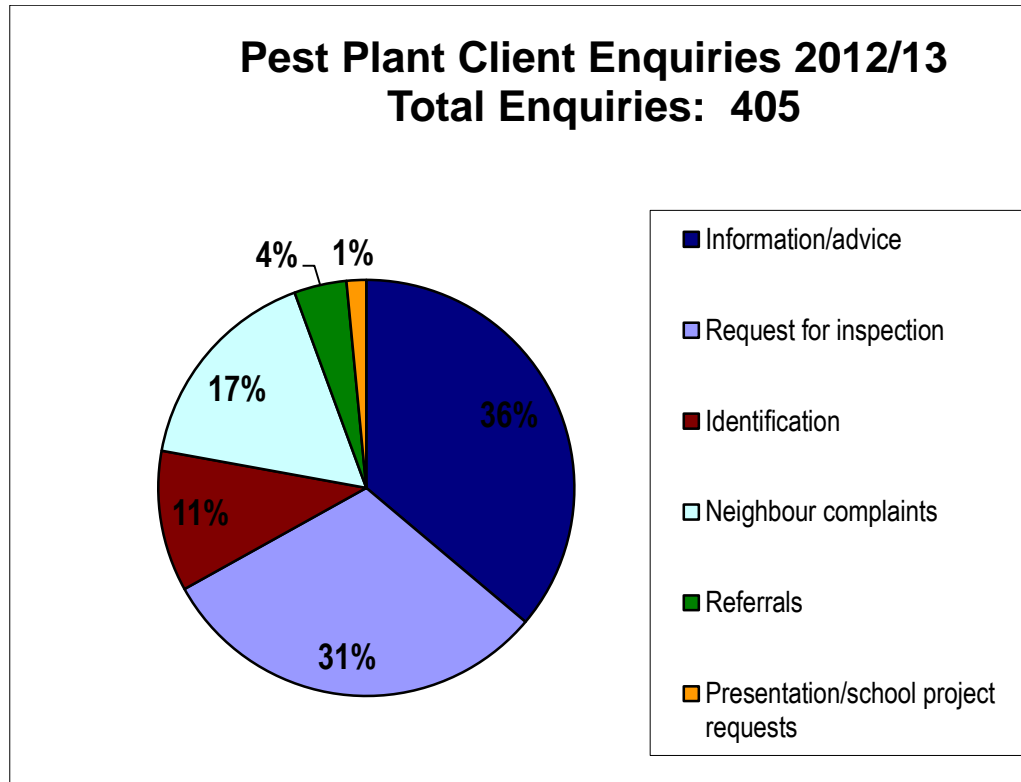
The Ministry for Primary Industries, regional councils, DOC and the Nursery and Growers Industry Association of New Zealand (NGINZ) reviewed and signed the new NPPA agreement.

All plant retailers in the region were visited to inform them of NPPA changes and supply updated booklets. Sites were also inspected for banned species. From these inspections it was evident that the NGINZ had not informed growers and retailers of these changes. Some of the new banned plants were found and removed from sale at one site. In total 186 outlets were visited within the region.

Staff inspected select markets in the region to inform stallholders about the NPPA. Inspections occurred prior to the stalls being open to minimise disruption to stallholders. No banned plants were discovered.

## 21. Client enquiries

A total of 405 enquiries were received during 2012/13.



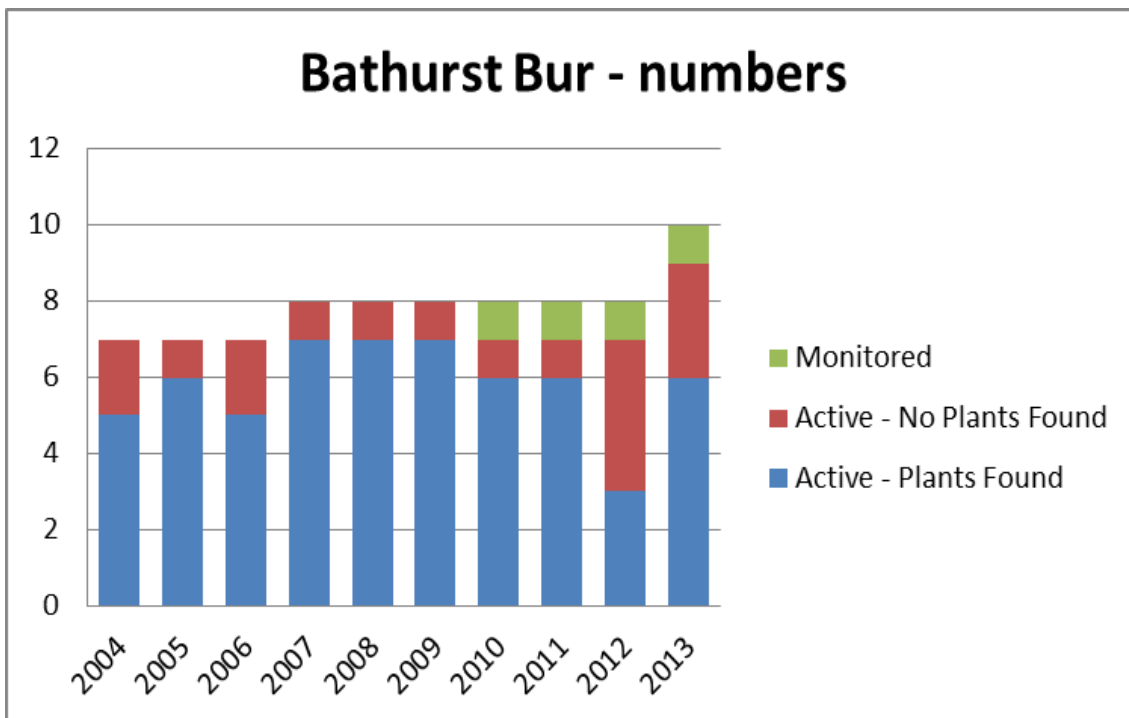
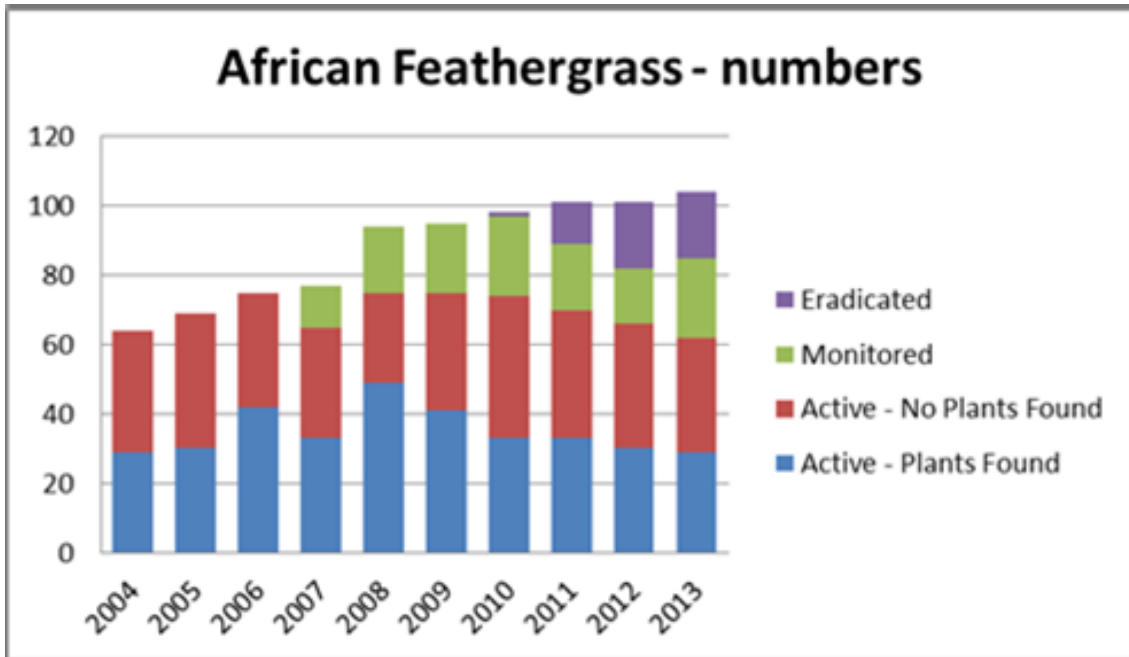
## 22. Financial summary

In 2012/13 we completed all pest plant management activities under the RPMS with an operating surplus of \$215,902

	\$ (000's)
Rates and Levies	1,256.1
External Revenue	88.4
Internal Revenue	755.5
<b>Total Operating Revenue</b>	<b>2,099.9</b>
<b>Total Direct Expenditure</b>	<b>1,391.3</b>
Group Overheads	493.3
<b>Total Operating Expenditure</b>	<b>1,884.6</b>
Surplus	215.3

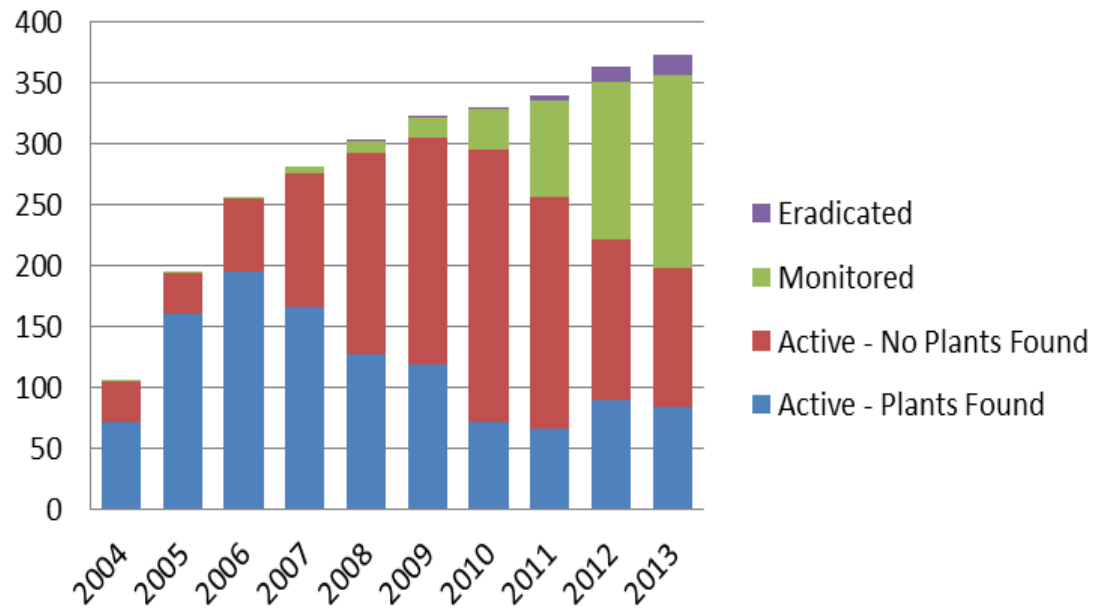


**Appendix 1. Total Control programme – results for individual species**

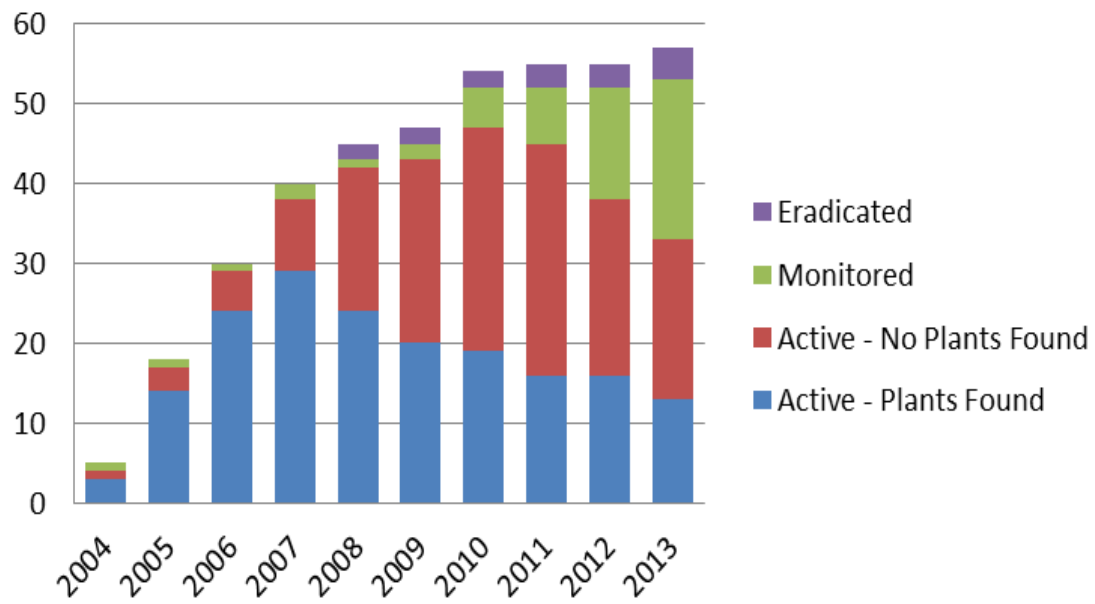




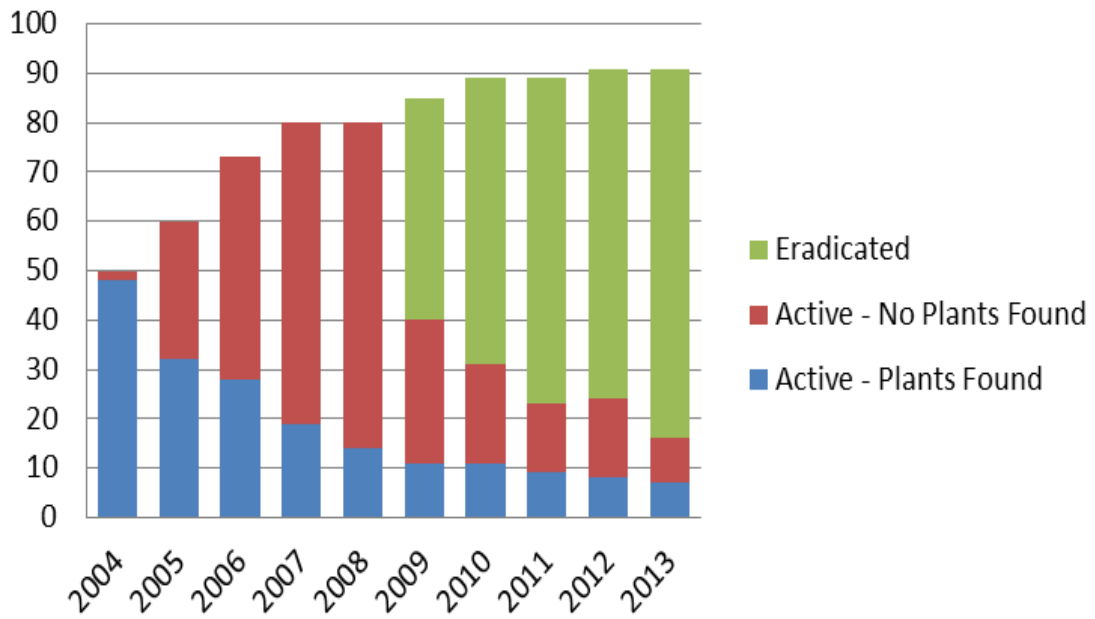
## Blue Passion Flower - numbers



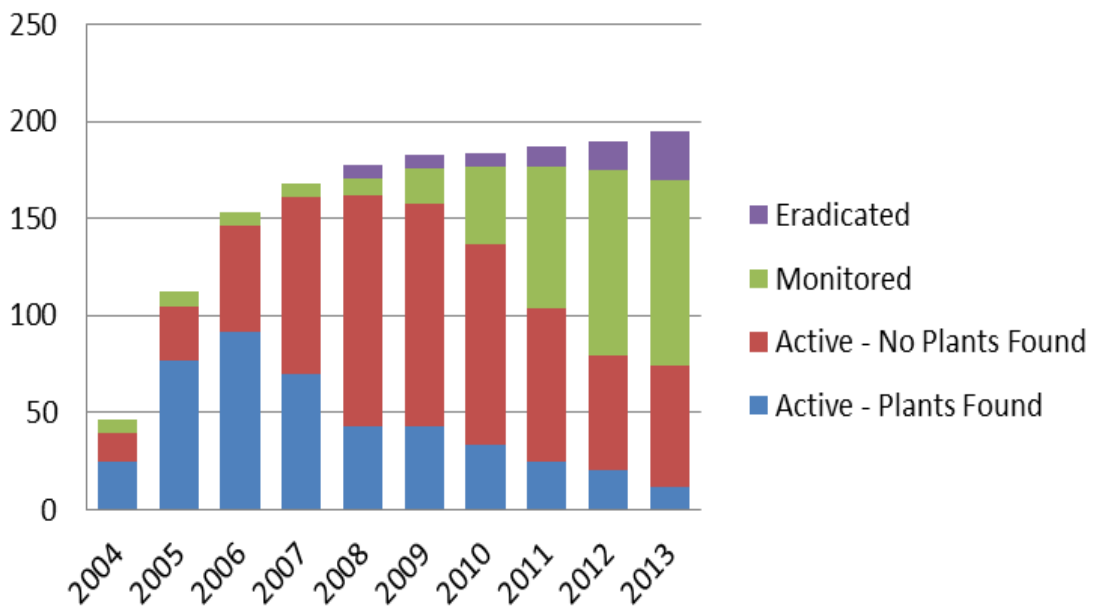
## Climbing Spindleberry - numbers



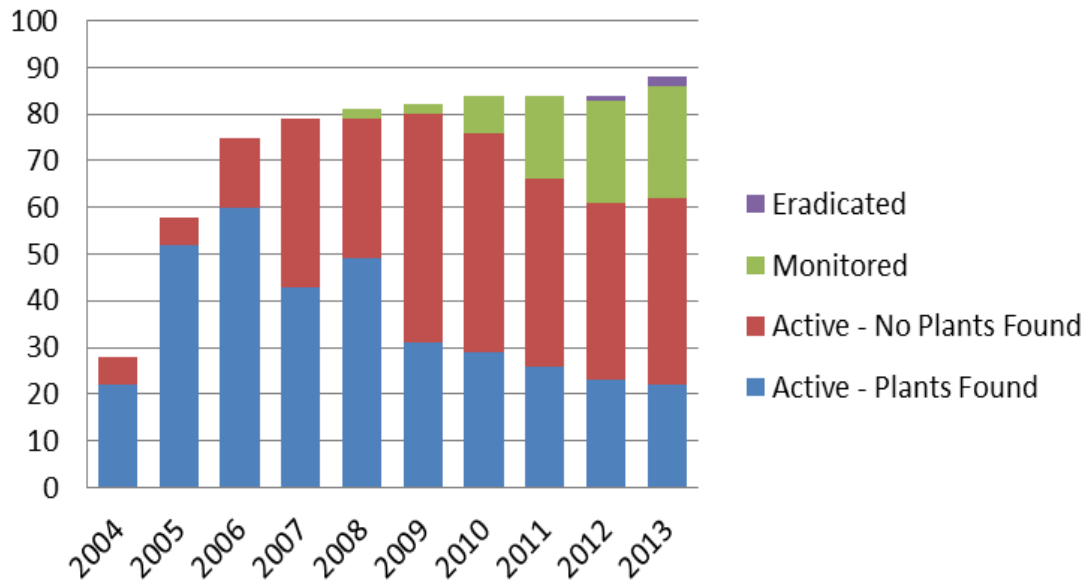
## Eelgrass - numbers



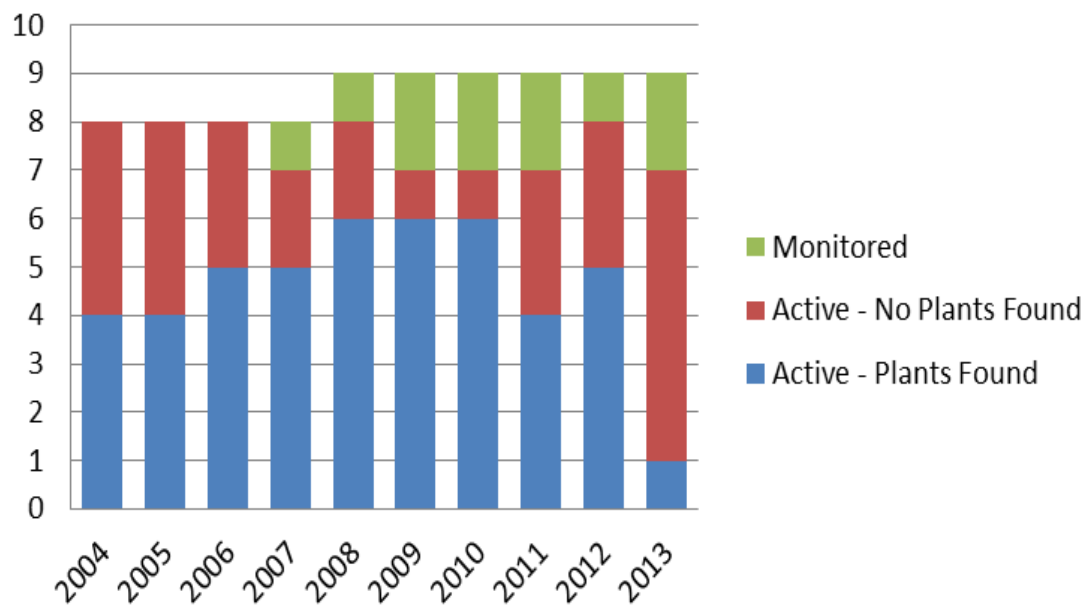
## Moth Plant - numbers



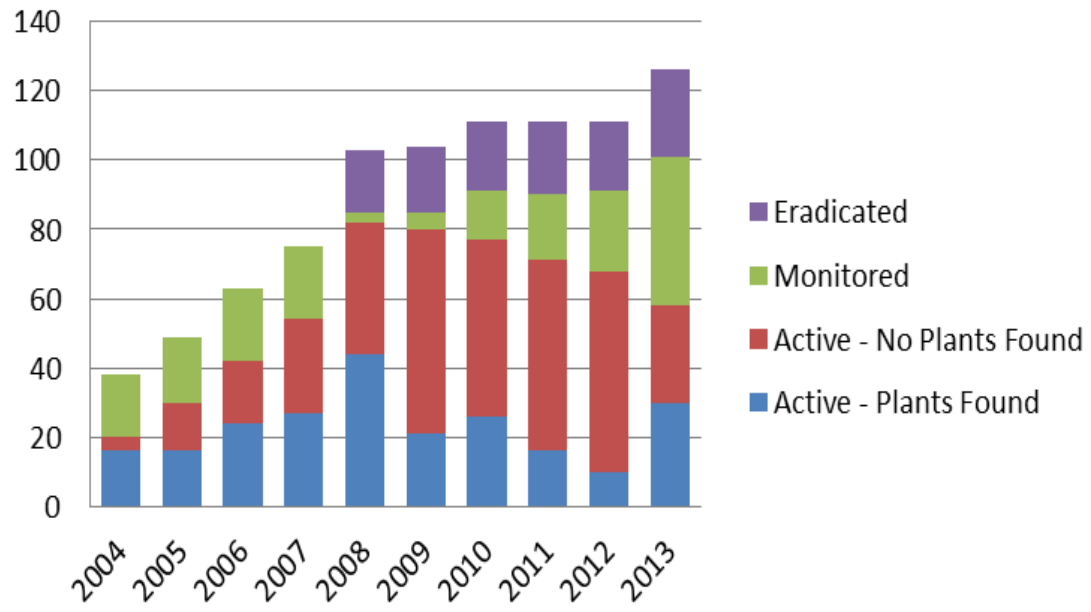
## Perennial Nettle - numbers



## Saffron Thistle - numbers



## Woolly Nightshade - numbers



## Appendix 2 – 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	12	established
Broom leaf beetle	2009	3	uncertain (1 beetle has been found 12 months after release)
Broom psyllid	1995	345	widespread
Broom seed beetle	1994	200+	widespread
Broom shoot moth	2008	3	uncertain
<b>Buddleia agents</b>			
Buddleia leaf weevil	2007	42	Established
<b>Gorse agents</b>			
Gorse colonial hard shoot moth	2002	4	failed
Gorse pod moth	1997	11	widespread
Gorse soft shoot moth	2007	4	uncertain
Gorse spider mite	1989	8	widespread
Gorse seed weevil	1930's	?	widespread
Gorse thrips	1990	478	widespread
<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	4	failed
Old man's beard leaf miner	1995	5	widespread
Old man's beard sawfly	2002	2	failed
<b>Ragwort agents</b>			
Cinnabar moth	2006	3	widespread
Ragwort plume moth	2012	3	established
Ragwort flea beetle	1988	43	widespread
<b>Thistle agents</b>			
Californian thistle flea beetle	1994	2	suspect failure
Californian thistle gall fly	2006	1	failed
Californian thistle leaf beetle	1993	3	failed
Californian thistle stem miner	2010	2	uncertain
Green thistle beetle	2008	13	established
Nodding thistle receptacle weevil	1972		established
Nodding thistle crown weevil	1990	4	established
Nodding thistle gall fly	2005	2	established
Scotch thistle gall fly	2005	12	established
<b>Tradescantia agents</b>			
Tradescantia leaf beetle	2011	6	established
Tradescantia stem beetle	2012	5	too early to determine
Tradescantia tip beetle	2013	5	too early to determine
<b>TOTALS:</b>		<b>1236</b>	

The Greater Wellington Regional Council promotes **Quality for Life** by ensuring our environment is protected while meeting the economic, social and cultural needs of the community

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