

## BIOSECURITY AND BIODIVERSITY

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Northland Region with its subtropical affinities, oceanic climate and wide variety of habitat types has an unusually high diversity of plants and animals including many species found nowhere else. Although more than 80% of these habitats have been modified or lost most of the remaining natural habitats, although fragmented, still have high biodiversity values and contribute to the natural character of the region. For more information on the Regional Council's current **biodiversity monitoring** (refer to page 2). These high biodiversity values are also at risk from the large number of pest plants and animals that are present in Northland.



As the management authority for pest plant and animals the Council is responsible for locating and controlling pests targeted in the Northland Regional Pest Management Strategies under the Biosecurity Act 1993. The Council's goal is to prevent potential pests from entering the region, as well as to manage existing targeted pest infestations to levels where they no longer pose a threat to natural ecosystems, primary production, and animal and human health. In 2005-2006 the Biosecurity team worked towards the many performance targets set out in the Long Term Council Community Plan under Biosecurity Management, refer to page 11 for more information.

In 2005-2006 the Regional Council Biosecurity team responded to 992 enquiries in relation to pest management, refer to page four for more information on enquiries. Biosecurity staff also carried out monitoring and/or control of:

- **Pest invertebrates** (refer page 5), including guava moth, tropical grass webworm, gum leaf skeletoniser and pest ants;
- **Animal pests** (refer page 7), including possums, mustelids, cats and rats and,
- **Pest plants** (refer page 8), including gorse, ragwort, bridle creeper, African feathergrass, lantana, Manchurian ricegrass, nassella tussock, spartina, Bathurst bur, Californian thistle and nodding thistle.

## Biodiversity monitoring and enhancement

In 2005-2006 the regional council developed a wetland monitoring programme and was involved with many landowner and community groups that are carrying out work to enhance biodiversity in Northland. In October 2005 \$300,000 was allocated to landowners and groups through the Environment Fund for environmental and enhancement projects. Over 90 projects received funding, including general restoration, wetland protection, pest control, revegetation and dairy farm Clean Stream Accord projects.

### ***Wetlands***

The NRC has developed a wetland assessment field form which uses a scoring system to rank and describe wetland areas on private land. Data recorded during the survey will be entered into a wetlands database. Twenty high value Northland wetlands have been selected in consultation with the Department of Conservation (DOC) and District Councils for initial assessment and ongoing monitoring. The photograph below shows Lake Karaka on the Pouto Peninsula, which is one of many relatively pristine dune lake wetland systems found in Northland.



### ***Community and Landowner initiatives***

A number of landowners and community groups have received technical advice for restoration, protection or replanting programmes including projects at Poroti Springs and Lake Omapere. The NRC has also been active in advocating protection of biodiversity at field days, shows and a wetland workshop at Waimate. NRC biodiversity staff have also participated in a number of assessments for proposed QEII covenants as well as assessments of areas containing significant habitats as part of subdivision proposals. Public enquiries about biodiversity are an indicator of increasing awareness and concern about environmental issues. At least 60 enquiries related to biodiversity were responded to in 2005-2006.

### ***Forest Monitoring Assessment Kit (FORMAK)***

FORMAK is a national biodiversity monitoring method which enables landowners and communities to assess the condition and monitor the recovery of native forest and forest biota. FORMAK data can be input into an online national database and is being used in Northland to assess Community Pest Control Area Projects. Training for 14 participants was held in Northland this year. NRC is part of both a Regional Interagency Team and a

National Interagency Team exploring ways of coordinating and expanding the use of FORMAK throughout New Zealand. Potentially FORMAK can be used for State of the Environment Monitoring and if used nationally will be a very powerful monitoring tool.

### ***Threatened Species Monitoring***

Northland has one of the most extensive lists of nationally threatened species of any region in New Zealand. It is important that species on this list are monitored and records kept so that the status of each species on the list can be tracked into the future. Staff have contributed a number of threatened species site records (both new and repeat records) to a national database. This database is used by a national committee to review the status of all species every two years.

NRC along with DOC and Auckland Museum botanists have assessed and ranked every native plant species known from Northland and developed a draft list of plants which are rare or regionally significant. This includes plants both on the nationally threatened list as well as plants which may be common elsewhere but are rare in Northland. This list will be sent out for public comment and will help guide landowners and agencies especially in land protection and planning matters.

The photograph below shows the rare turf plant *Limnosella lineata*, found on the shores of Lake Omapere.



## Biosecurity enquiries and surveillance

The Council biosecurity and pest management officers responded to 992 queries during 2005-2006 financial year. A general trend has been an increase in the range of biosecurity related queries including more associated with environmental pests and invertebrates (especially ants). Biosecurity issues during this time have been highlighted frequently in the media via television programmes, through Biosecurity New Zealand's response to incursions and national promotions (e.g. weedbusters). The increased biosecurity profile may have contributed to the nature of enquiries. The number and types of enquiries helps to identify emergent issues and assess if current public knowledge needs are being resolved.

Consultants working on behalf of Biosecurity New Zealand (BNZ) surveyed the port areas of Opuia and Marsden Point and the Tutukaka marina as part of a national survey of the distribution of *Styela clava* (sea squirt). While a specimen was found at Tutukaka, both Opuia and Marsden Point were clear. BNZ contracted a consultant in June 2006 for a trial eradication programme at Tutukaka.

BNZ also advised the Council of an infestation of *Phytophthora kernoviae* (plant disease) in cherimoya trees near Broadwood. Surveys of kauri trees, another possible host, in Northland are ongoing.

## Invertebrate Monitoring

### ***Guava moth***

The guava moth (*Coscinoptycha improbana*), a native of Australia, has a voracious appetite for the fruit of many Northland trees – feijoa in particular. They were first found in Kaitaia in 1997. Since then the Council has been involved in monitoring the spread and distribution of guava moth in Northland. Pheromone traps have been placed around the region to trap the adult moth. In 2004 it was found that guava moth are quite well distributed throughout Northland, so the role of the council has been reduced to investigation of sightings outside known infestation areas. The Council has also produced a pamphlet to assist identification and management of quava moth, which is available on the Regional Council website as a pdf under publications.

### ***Tropical grass webworm***

The tropical grass webworm (*Herpetogramma licarsisalis*) has caused severe pasture damage in the Far North. In the last major outbreak in 1999, five hectares of paddocks were completely chewed out in less than 48 hours. 1500 caterpillars per square metre were recorded, equivalent to 15 million per hectare.



A monitoring programme is actioned each summer to assess number of larvae and adults in Far North properties to pre-empt a heavy infestation of webworm. This gives a window of opportunity to warn farmers of an imminent outbreak and instigate management practices to lessen the impact. Monitoring is undertaken over summer (December-April) on the Aupouri Peninsula where previous major infestations have occurred. Pheromone traps are installed to capture any adult moths. Weekly counts at four sites are undertaken of webworm larvae in 25 quadrants randomly over half a hectare to determine the number of larvae per square metre.

Detailed weather data, including rainfall and hourly temperature recordings, is collected from an electronic data logger. Reports on the potential risk of pasture damage is issued to farmers on a regular basis, recorded in the Kaitaia-based 'Northland Age' newspaper and NRC website.

Over the 2005-06 summer period 452 moths were caught in pheromone traps, mostly during March when the weather was warm, moist, and humid. A peak of 38 larvae/m<sup>2</sup> was recorded at one site during April. Fortunately, there was not a serious infestation of webworm in 2005-2006, despite favourable weather conditions later in the summer. This was probably due to dry conditions in early summer. Similar monitoring will continue next financial year.

### ***Gum leaf skeletoniser***

The gum leaf skeletoniser (*Uraba lugens*) is an Australian insect that damages, mostly gum trees (*Eucalyptus* sp.), by eating the foliage. It is now widespread in the greater Auckland region. In collaboration with HortResearch, Biosecurity NZ, and Ensis, the Council assists in monitoring the distribution and spread in Northland.

In March and April 2006 60 pheromone traps were deployed on eucalyptus trees at high risk sites throughout the region. Of the 60 traps only four had any moths which resembled the gum leaf skeletoniser; these are currently being formally identified. To date the gum leaf skeletoniser has not been identified in Northland from this programme. This monitoring is not routine but will be carried out again in the future as required.

### **Pest ants**

Pest ants, particularly the Argentine ant (*Linepithema humile*), have become a prominent pest issue throughout Northland in recent years as population densities have increased, particularly in urban areas. Existing records of pest ants were clustered around urban centres as that is where most complaints are generated. This summer the Regional Council, in conjunction with the Department of Conservation, monitored sites around significant ecological areas to determine presence/absence. The monitoring had two aims: to help direct policy development and to initiate control work if feasible in these important areas.

A total of 345 bait stations were set in the 14 sites surveyed. Argentine ants were only found on one bait station; close to the golf course in Ahipara. Survey results are summarised in the table below.

Site	Date	Number of baits stations	Argentine ants identified
1. Mimiwhangata -carpark/beachfront	20/12/05	40	0
2. Bland Bay	5/1/06	35	0
	9/1/06	35	0
3. Te Paki - DOC Field Centre	16/1/06	30	0
4. Cape Reinga	17/1/06	15	0
5. Taupotupotu Bay	17/1/06	15	0
6. Waitiki Landing	17/1/06	20	0
7. Te Hapua	18/1/06	20	0
8. Spirits Bay	18/1/06	20	0
9. Ahipara Coast	3/2/06	18	1
10. Ahipara Gumfields	3/2/06	22	0
11. Mimiwhangata - campground	7/2/06	20	0
12. Mimiwhangata - Molly's Bush	7/2/06	20	0
13. Houhora Head	10/2/06	20	0
14. Kaimaumau Village	10/2/06	15	0
<b>TOTAL</b>		<b>345</b>	<b>1</b>

The results of this survey suggest that Argentine ants were not present at most of the sites surveyed. However, the natural rate of spread of Argentine ant colonies is thought to be less than 200m/annum, therefore it is probable that very small populations may be missed. The design of the survey aimed to target known preferred habitats of Argentine ants at the survey sites and vector pathways (e.g. car parking areas, farm equipment) in an effort to pick up small incursions of ants. Despite this methodology, Argentine ants were confirmed at the settlement within the surveyed area at Bland Bay within a few weeks of the survey. Although the settlement is over 1km from the area targeted for protection, it was included in the survey as the presence of people act as a very high risk for vector ant incursion.

Future monitoring will include surveillance monitoring that targets vector points (entry points) in to Northland such as ports and marina areas and significant ecological and economic areas where the potential impacts from a pest ant incursion are high.

## Animal Pests

Over the past year the Council has moved in a new direction in terms of pest control. The 'once over' control programme for possums had been completed and now the focus is to assist groups of land occupiers committed to protecting economic, biodiversity and/or cultural values. This is site specific integrated pest management that is, targeting several pests (including pest plants and insects), recognising the ecological dynamics of an ecosystem. Some plants pests can expand following animal pest control operations, highlighting the need for integrated pest control.

Four Community Pest Control Areas (CPCA), covering a total of 6840 hectares, were set up in 2005-2006, in Oneriri, Maungaraho Rock (near Dargaville), Te Kuri (pouto) and Petley Road (near Matakoho), and stage one of their respected management plans undertaken. Species targeted include possums, mustelids, cats, rats and pest plants. As part of this programme operational and outcome monitoring is undertaken.

Operational monitoring shows that work to date has been very successful in the Oneriri CPCA. The Possum Activity Index (PAI) was very low at 4% and similarly the Rat Activity Index (RAI) was low at 1%, indicating an excellent control has been achieved. To assess the success of mustelid control 50 tracking tunnels were laid on a grid system throughout the 3748 hectare Oneriri site. No sign of mustelids was recorded during the 21 days the tunnels were deployed. Monitoring at the other CPCA projects is currently underway.

Outcome monitoring to date at the Oneriri CPCA has been limited to the establishment of photo points to capture changes in native biodiversity as pest populations diminish. Already substantial recovery of foliage has been observed indicative of a greatly reduced possum population. The photograph below shows excellent shoot regrowth on a pohutukawa tree in the Oneriri CPCA.



Using the Forest Monitoring and Assessment Kit (FORMAK) communities, with Regional Council assistance, will be implementing comprehensive outcome monitoring at all CPCA sites (where appropriate), over the next few years to document the recovery of biodiversity as a result of pest control activities. See the **Biodiversity** (refer to page two) section for more information on the Forest Monitoring and Assessment Kit.

## Pest Plants

Traditionally the Council has played a strong role in assisting and advising landowners with primary production pest plants, such as gorse and ragwort. More recently landowners are taking a greater interest in protecting and enhancing native biodiversity on their own land and that in the public domain. Council staff are increasingly being called upon to provide advice on the control of environmental plant pests such as moth plant (*Araujia sericifera*) and tradescantia (*Tradescantia fluminensis*)

Generally good progress has been made to meet performance targets but there are some areas of concern:

- Data inconsistencies or gaps in the monitoring records.
- Data deficiencies means that it is difficult to assess the success/failure of strategies and status of emerging pest plants

As part of the Biosecurity department's quality system work is being carried out to improve the gaps in data identified above.

### ***New Zealand Pest Plant Accord (NZPPA)***

As part of a national collaboration between the Nursery Association and local and central Government, biosecurity staff annually visit nurseries and other outlets which sell plants to look for plants banned from sale and distribution under the Biosecurity Act 1993. No unwanted organisms were found in any establishments this year.

Council staff also monitor for Notifiable Organisms under the Biosecurity Act. There are five pest plant species that fit into this category; water hyacinth (*Eichhornia crassipes*), cape tulip (*Homeria collina*), water lettuce (*Pistia stratiotes*), salvinia (*Salvinia molesta*) and Johnson grass (*Sorghum halepense*). Two infestations of salvinia (*Salvinia molesta*) have been found in the Whangarei area.

### ***Biological Control Monitoring***

#### **Gorse**

Strains of the English gorse thrip (*Sericothrips staphylinus*), that were released in the mid nineties in the Uretiti and Poretu areas, did not survive in Northland or thrive anywhere else in New Zealand. So four populations of the more robust Portuguese strain were released in the Far North in January 2006. Thrips are most likely to affect the growth and survival of gorse seedlings and regrowth, because they prefer the new young shoot growth.

Monitoring of the other gorse agents for example, soft shoot moth (*Agonopterix ulicetella*) and pod moth (*Cydia ulicetana*), found insects at low infestation levels at release sites. Re-release of the soft shoot moth may be considered as populations are doing very well in the South Island. The hard shoot moth (*Pempelia grandipennis*) has been deemed a failure and no further work to try to establish populations in Northland will be attempted.

#### **Ragwort**

Monitoring of the ragwort flea beetle (*Longitarsus jacobaeae*) found that reasonable populations exist throughout the region, therefore no collecting and relocating was required in 2005-2006.

**Bridle creeper**

A survey of *Asparagus asparagoides* (smilax or bridle creeper) by Landcare Research staff has found a pathogen (rust) attacking the plant, causing considerable damage. It is thought the rust may have blown over from Australia. Council Biosecurity officers have been monitoring for instances of the rust in the Northland region, with one infestation confirmed in Whatitiri. Landcare Research scientists are currently investigating the best methodology to move it around and Council Biosecurity Officers will then be charged with that responsibility.

***Pest Plant Operational Monitoring***

- 63 African feathergrass sites were inspected with density at all sites substantially reduced to three to ten plants. No plants were found at 12 sites and therefore these sites no longer require control work but remain under surveillance.
- Inspection and control of 200 lantana sites was undertaken in the Whangarei District between October 2005 and June 2006. Dargaville & Te Kopuru urban areas were also targeted and a large number of plants controlled in private gardens.
- 74 scattered infestations of Manchurian ricegrass that are outside of the main infestation area of the Northern Wairoa River are annually inspected and controlled. Two new sites have been found recently on the Kaipara harbour at Hukatere and one in Whangarei. Manchurian ricegrass is notoriously difficult to control and thus only five of the 74 sites recorded severe dieback in 2005-2006.
- 39 properties were inspected for nassella tussock and 33 plants were found on only six properties and controlled. 24 properties, which have had nassella controlled, have remained clear of the pest plant for the last three years.
- Monitoring reveals that 70 hectares of spartina exists in the Mid and Far North with 45 hectares now included in the control program. Monitoring of 32 controlled sites in the Kaipara Harbour was undertaken, 12 sites were clear with no regrowth found. The remaining infestations underwent further control works. Aerial monitoring of spartina in the Hokianga Harbour found 40 new locations totaling approximately 30 hectares; one third of this is now included in a control programme.
- No new infestations of the 12 surveillance plant species ('the dirty dozen'), listed in the table below, were found during the monitoring in 2005-06. The *Rhamnus alaternus*, evergreen buckthorn, site has been progressively reduced in size over the last 10 years. The remaining area, about one hectare, was controlled during 2005-2006.



**The Dirty Dozen**

- eelgrass (*Vallisneria gigantea*)
- senegal tea (*Gymnocoronis spilanthoides*)
- hydrilla (*Hydrilla verticillata*)
- nardoo (*Marsilea mutica*)
- water poppy (*Hydrocleys nymphoides*)
- needlegrass (*Stipa tenuissima*)
- skeleton weed (*Chondrilla juncea*)
- evergreen buckthorn (*Rhamnus alaternus*)
- old man's beard (*Clematis vitalba*)
- houttuynia (*Houttuynia cordata*)
- entire marshwort (*Nymphoides geminata*)
- fringed water lily (*Nymphoides peltata*)

**Pest Plant Compliance Monitoring**

- 123 sites of Bathurst bur and 120 sites of nodding thistle were all monitored at least once during the year to ensure that property owners achieved complete control of all plants. 24 sites of Californian thistle were identified during 2005-2006.
- All operating quarries were inspected and most sites were found to be to complying with the rules of the Regional Pest Management Strategies. Several quarries were requested to do work and are working towards compliance. No formal instructions to clear, under the Biosecurity act 1993, were issued during 2005-2006.

## Biosecurity Management performance targets

**The following performance targets for Biosecurity Management are taken from the 2004-2014 Long Term Council Community Plan for Northland:**

- Promote pest management options for quava moth and tropical grass webworm
- Undertake pest management operations in support of landholders and community groups, within defined community pest management Areas, in accordance with community pest management plans prepared for each area.
- Control a variety of pest plants around the region (Manchurian rice grass, African feathergrass, spartina, nassella tussock and lantana)
- Provide advice on the control of pest plants, animals and insects and an identification service
- Monitor infestations of Bathurst bur, nodding thistle and Californian thistle and ensure landholders are implementing agreed plant eradication programmes
- Enforce boundary clearance of gorse, broom and ragwort in response to complaints.
- Enforce quarry and roadside weed policies
- Promote the introduction of appropriate biological control agents