

**Prioritised surveillance strategy for invasive ant species in  
Northland**

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## Summary

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### Project and Client

- Provision of advice on surveillance for invasive ant species was undertaken for Northland Regional Council by Landcare Research in September–November 2006.

### Objectives

- The aim of this report is to design a surveillance programme for targeted invasive ant species in Northland. The surveillance programme gives priority to sites of highest risk and highest ecological value.
- The outcome is to prevent the establishment and subsequent spread of targeted ant species into significant ecological areas in Northland.

### Methods

Sites were split into three classes: 1) points of entry, 2) risk of establishment and 3) ecological value.

- A list of high risk point of entry sites were obtained through discussion with Northland Regional Council and Biosecurity New Zealand. These sites are most likely where invasive ant species would arrive in the Northland region from overseas, and includes the surveillance species of concern to the Northland region.
- High risk sites were categorised on the basis of their association with the movement of high risk goods. Risk goods and sites were determined based on data from scientific literature and the experience of invasive ant species experts.
- Sites of ecological value were obtained from Northland DOC staff and were ranked on various criteria, including Protected Natural Area guidelines, a broad habitat classification, and the relative number of visitors.

### Results

- Point of entry sites: nine high risk points of entry were selected. These sites include a mix of wharves, the two major transitional facilities in Northland and several boat yards that store and refit boats.
- Establishment risk sites: seventeen sites were given a high risk ranking, and 163 sites a medium risk ranking. High risk sites are based around businesses that are most likely to supply and frequently move bark, garden material, and fresh produce (e.g. fruit, flowers, vegetables). Sites of medium risk are based around plant material (lawn turf, trees), rubbish disposal (rubbish bins, scrap metal), landscape suppliers (including orchard suppliers, garden centres), timber and wood products, and camping grounds.
- Value sites: forty five value mainland sites were ranked, and twelve were given a high priority ranking. Within the priority framework, sites were also graded on two factors. First, on the basis of habitat, where sand/gumlands and wetland had priority over forest. Second on the basis of visitor numbers, where sites with higher visitor numbers were given priority.

### Recommendations

- Sites classified as high risk or high priority rank should be visited first.
- If time and resources are available then re-visiting the same site for the same amount of time would be beneficial – to determine detection probability. However, because of resources this should apply only to high risk and high value sites.
- Direct searching for ant species should be used, as this method is highly suitable for detecting the presence or absence of invasive ant species.
- Approximately 30 minutes should be spent at each site.
- If this surveillance strategy is to be carried out over multiple years, it is recommended that high risk and high priority sites are re-visited before other sites of lower priority.
- The results of the surveillance should be briefly evaluated after the first year. This will assist in developing a longer term surveillance strategy and optimising the process of site prioritisation.

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## 1. Introduction

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### 1.1 Invasive ant species

Invasive ant species are currently receiving considerable attention around the globe. There is increasing evidence of economic and agricultural losses, health effects on humans, and disruption to natural ecosystems as a result of invasive ants (Holway et al. 2002). Although only a handful of invasive ant species are well studied, there are many other ant species with the opportunity to become invasive (McGlynn 1999, Lester 2005, Suarez et al. 2005).

Ants are the second most common family of insects intercepted by quarantine personnel at the New Zealand border (Keall 1980). A total of 115 ant species from 4355 interceptions have been detected over the last fifty years at the New Zealand border (Ward et al. 2006). Many of the species commonly intercepted are invasive species, and several have already become established in New Zealand.

To reduce the threat of invasive ants three aspects need to be identified: 1) a national priority list of invasive ant species, 2) the regions and habitats most at risk, and 3) high risk pathways, vectors, and commodities, both into and within the region of interest (Anon 2006). A recent assessment of these intercepted species shows that many pose a high risk to New Zealand and could negatively impact on economic, cultural and environmental sectors (Harris et al. 2005). This reports builds on the framework of high risk invasive ant species for New Zealand (Harris et al. 2005), specifically for Northland.

Two important factors that contribute to the establishment and subsequent spread of invasive ant species are 1) suitable climate and 2) dispersal ability.

It is well known that climatic variables, especially temperature, rainfall and humidity, play a large role in determining the distribution of ant species. Many of the invasive ant species currently established in New Zealand show restricted northern distributions which are associated with warmer temperatures (Harris et al. 2005). When invasive ant species are discovered in cooler environments, they are often closely associated with artificial heating sources (e.g. buildings, concrete, etc). The warm, and relatively mild, climate conditions in Northland predispose this region to the establishment of invasive ant species, and their rapid colony growth.

Dispersal ability is also an important aspect of biological invasions. Although most ant species disperse by flying or walking, this generally occurs on a small scale. However, many pest ant species are closely associated with humans and are accidentally transported by humans to new locations. Typically ants are transported in soil, bark, potting mix, vegetative material and within vehicles. This human-mediated dispersal (HMD) can occur over hundreds of kilometres (Suarez et al. 2001), and is primarily responsible for the range expansion of Argentine ants (*Linepithema humile*) in New Zealand (Ward et al. 2005). There is less certainty about the dispersal of other invasive ant species (because they are not well studied), although it is probable that HMD is also important in their spread and distribution (Harris et al. 2005).

Currently there are 28 invasive ant species established in New Zealand (Ward 2005, see Appendix 1). Several of these invasive ant species are widespread throughout the country, especially the North Island, and are usually conspicuous, as they often occur in residential areas and houses. This is in contrast to the small native ant fauna of 10 species, which are seldom seen and more commonly found in native ecosystems.

Of the invasive species already in the country, of most concern is the Argentine ant, whose negative impact on native biodiversity and horticulture has been well documented overseas (Harris 2002, Harris et al. 2002a). In New Zealand, the habitats most at risk of invasion by Argentine ants are open canopy environments (scrub, coastal open forest, mangroves), while forests are less susceptible (Ward & Harris 2005). Although it is possible to successfully control, and even eradicate small populations, of Argentine ants (Harris et al. 2002b, Stanley 2004), the key to this is surveillance and early detection.

## 1.2 Surveillance

To reduce the threat of invasive ants two major points of action need to be considered. First, measures to prevent their entry, and second, responses to eradicate or control incursions and limit their spread (Anon 2006). Both of these points rely heavily on surveillance strategies to detect invasive ants.

Most detection programs rely on the inspection of cargo and known pathway associations of pest species at points of entry along the border (Murphy 2004). However, border surveillance does not provide 100% detection ability. Furthermore, border inspection does little to detect and assess the movement of pests within a country, especially movement from an infected region to a non-infected region. Thus, as part of a larger biosecurity strategy, there is a need for active post-border surveillance (Anon 2006).

Risk goods should be targeted in the following order (Murphy 2004). The first targets are the points of entry into New Zealand (ships and aircraft). The second targets are goods moved to devanning sites (i.e. transitional facilities). The third targets are essentially those that fall “outside” the first two, in particular sites where requirements for the survival and reproduction of species are met (Murphy 2004). However, as it is not practical (and often impossible) to inspect all potential sites of invasive ant establishment, it is crucial that resources are allocated to maximise surveillance effort and detection.

Murphy (2004) outlined the concept of high risk site surveillance (HRSS). This is the deliberate targeting of high risk sites associated with risk goods and pathways, and are thus more likely to be sites of establishment that spread invasive species (Murphy 2004). Critical to this concept is the ability to rank sites and identify their location. Efficient surveillance methods, flexible design, and the ability to measure surveillance effort are also important (Murphy 2004).

The ability to rank risk sites is often limited by the quality of information on risk good (Murphy 2004). However, for invasive ants, several recent publications give us an excellent ability to characterise risk goods and pathways, and thus link these to specific sites (MAF 2002, Harris et al. 2005, Lester 2005, Suarez et al. 2005, Ward et al. 2006).

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## 2. Objectives

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The aim of this report is to design a surveillance programme for targeted invasive ant species in Northland, which gives priority to sites of high risk of establishment and high ecological value. The intended outcome is to prevent the establishment and subsequent spread of targeted ant species into ecologically significant areas in Northland.

### 2.1 Scope

The Northland Regional Pest Management Strategy for invasive ant species currently recognises two categories of invasive ant species: pest species and surveillance species. Pest species include the Argentine ant (*Linepithema humile*) and Darwin’s ant (*Doleromyrma darwiniana*), both of which are present in Northland. Surveillance species include four species not recorded as being present in Northland; the big headed ant (*Pheidole megacephala*), the tropical fire ant (*Solenopsis geminata*), the crazy ant (*Paratrechina longicornis*), and the ghost ant (*Tapinoma melanocephalum*).

Although these six species are the focus for this report, the proposed prioritisation of sites and sampling methodology could also be used to detect a wide range of other invasive ant species in Northland.

This report focuses on ecologically significant areas in Northland. Although not specifically addressed; some sites of significant economic and cultural value will be included. It is intended that passive surveillance opportunities such as, advocacy and stakeholder workshops are used to target areas of economic and cultural significance.

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## 3. Methods

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### 3.1 Site prioritisation

Sites were split into three classes:

#### 3.1.1 *Points of Entry*

Points of entry sites are where goods are unloaded into a site that is the first point of entry into New Zealand. These sites include seaports, airports and transitional facilities and are typically where the majority of surveillance is undertaken.

High risk points of entry and transitional facilities in the Northland region were determined through discussions with the Northland Regional Council and Biosecurity New Zealand (BNZ) staff.

#### 3.1.2 *Establishment Risk Sites*

High risk sites have a strong association with, and movement of, risk goods. As a consequence, these sites have a higher probability of acting as a source for the spread of invasive ants, and as sites of early establishment within a region.

Because invasive ants are often easily dispersed through the actions of humans, risk sites are those that will be primarily associated with humans. To determine what constitutes a high risk site, it is necessary to consider the movement (i.e. pathways) of risk goods. Information on what constitutes risk goods for invasive ant species was obtained from the hazard identification and import release assessment for the red-imported fire ant, *Solenopsis invicta* (MAF 2002); the invasive ant pest risk assessment for New Zealand (Harris et al. 2005); and the scientific publications of Lester (2005), Suarez et al. (2005), and Ward et al. (2006).

The Telecom yellow pages (for Northland 2006/2007) were searched for business categories that could be associated with risk goods. These categories were given a high-medium-low ranking (Appendix 3), and businesses (i.e. sites) from the high-medium categories were compiled into an excel spreadsheet.

#### 3.1.3 *Ecological Value Sites*

A list of natural sites which significant ecological value in the Northland conservancy was obtained from Department of Conservation (DOC) staff. To be included on this list, a site needed to fit one or more of the following criteria (based on level one guidelines from the Protected Natural Area (PNA) criteria): 1) contains or is regularly used by critical, endangered, vulnerable or declining or naturally uncommon taxa, or taxa of indeterminate threatened status nationally (Molloy et al. 2002); 2) contains the best representative examples in the Ecological District of a particular ecological unit or combination of ecological units; 3) has high diversity of taxa or habitat types for the Ecological District; 4) forms ecological buffers, linkages or corridors to other areas of significant vegetation or significant habitats of indigenous fauna; 5) contains habitat types that are rare or threatened in the Ecological District or regionally or nationally; 6) covers a large geographic area relative to other similar habitat types within the Ecological District.

These sites were then divided into a high-medium-low priority ranking on the following criteria:

- High priority sites were defined as containing the best representative examples in Northland of a particular ecological unit or combination of ecological units; and containing a high number of acutely threatened or chronically threatened taxa.
- Medium priority sites were defined as containing the best representative examples in the Ecological District of a particular ecological unit or combination of ecological units; contains or is regularly used by critical, endangered, vulnerable or declining or naturally uncommon taxa (i.e. species and subspecies), or taxa of indeterminate threatened status nationally; and contains habitat types that are rare or threatened in the Ecological District or regionally or nationally.

- Low priority sites were defined as having a high diversity of taxa or habitat types for the Ecological District; forming ecological buffers, links or corridors to other areas of significant vegetation or significant habitats of indigenous fauna; and covering a large geographic area relative to other similar habitat types within the Ecological District.

Sites within the high-medium-low priority framework were further graded on the basis of a broad habitat classification, and the relative number of people that might arrive in the site. Current knowledge of Argentine ants (and many other invasive ant species) suggests they prefer habitats that are relatively disturbed and/or have open canopy (Harris et al. 2002a, Ward & Harris 2005). Thus open canopy habitats (e.g. sand dunes, scrub, geothermal areas, etc) are at greater risk than closed canopy environments (e.g. forest). However, it should be noted that this is a generalisation of habitat use, and under certain situations this 'habitat rule' may not hold. A higher number of people generally equates to a greater risk of ants being transported to the site. DOC staff supplied estimates of visitor numbers at each site on a relative basis of high, medium or low.

Grid references of all sites (NZMG and latitude/longitude, WGS84 datum - in decimal degrees) were obtained using Topomap® software. It should be noted that grid references are approximate because Topomap® does not contain references to street numbers, but only streets/roads.

## 3.2 Surveillance strategy

### 3.2.1 Site Visits

The order of site visits is determined by the site risk/priority ranking. Sites with a high risk or a high priority are the most important to visit first. However, flexibility is also a key element in any surveillance strategy (Murphy 2004). It may be beneficial to examine a combination of high and medium risk sites at the same time within a region to save on travel time/costs. For example, a mixture of high and medium risk sites could be surveyed in the far north region of Northland. This combination strategy is useful as long as it does not jeopardise the ability to visit all of high risk and high priority sites by the end of the project. Once a site is selected, sampling for ants should be carried out as described in section 3.2.2.

If time and resources are available then re-visiting the same site for the same amount of time would be beneficial. A problem in surveillance strategies are records of "absence". Does "absence" really mean the species was absent, or it is possible that when the sampling was carried out the species was present but not detected? Repeat sampling will increase the probability of detecting a species at a site. Repeat sampling and the issue of detectability are particularly important for detecting invasive ant species. If time and resources are available, sites of highest risk/priority should be revisited first.

If this surveillance strategy is to be carried out over multiple years, it is recommended that repeat surveillance visits be made to the high risk and high priority sites before other sites of lower priority. The surveillance results should be briefly evaluated after the first year. This will assist to develop a longer-term surveillance strategy and optimise the ability of site prioritisation.

### 3.2.2 Sampling Techniques

Direct or hand searching involves searching for, and collecting, ants in different microhabitats within an area (Bestelmeyer et al. 2000). Direct sampling is particularly useful when the main objective is to determine which ant species are present or absent, and no information is required on their abundance or biology. Direct searching it is highly suitable for detecting the presence or absence of invasive ant species.

Direct searching uses a minimum of material in the field. Field materials include: an aspirator (to collect ants), vials (5mm, plastic, to store ants), ethanol (95%), a timer, and site labels. An additional advantage of direct searching is that less time is needed in the laboratory to sort and identify ant species. No time is needed to extract ants from messy baits, or from the litter or soil. The amount of time spent in the surveillance of sites is therefore maximised.

Direct searching is an easily learned technique. It basically requires good observation skills and careful examination of different microhabitats where ants are commonly found: such as curbing and



the edges of paths, garden edging, bare ground, leaf litter, twigs, under and on plants, under stones/metal, at the base of plant roots. Although the targeted ant species are quite small (1-4 mm), they are diurnal and usually very active on the ground. Therefore, they should be relatively easy to observe.

When ants are discovered, an aspirator is the best method to collect them. The aspirator (also known as a “pooter”) is used to “suck” ants into a tube, where they can then be transferred to a vial. Approximately five ant specimens should be collected if possible – having several specimens may help during identification. Every vial should be labelled with site name/code, date, and collector. Labels should be written either in pencil or with a drawing pen (e.g. Staedtler pigment liner) – otherwise the ink will run when placed into the ethanol. A biro pen is not suitable.

To standardise collecting effort, it is recommended that the time spent searching for ants at each site be recorded. Approximately 30 minutes should be spent at each site, however, this may vary depending on the size of the site, etc. However, a minimum of 15 minutes must be spent at each site. At the end of the 30 minute period all ants collected are placed into one vial of ethanol.

Ants should be identified using a binocular microscope of between 10-40x power. Any difficult or suspicious specimens can be sent to the author. To identify ants, the online key to New Zealand ants in combination with a reference collection is an excellent method. The online key can be found at: <http://www.landcareresearch.co.nz/research/biosecurity/stowaways/key/index.asp>

## 4. Results

### 4.1 High Risk Point of Entry Sites

Nine high risk points of entry were selected (Appendix 2). These sites include a mix of wharves, the two major transitional facilities in Northland and several boat yards that store and refit boats (M. Sarty *pers. comm.*). These sites are most likely where invasive ant species not already established in New Zealand would arrive in the Northland region. This includes the four surveillance species of concern to the Northland region: the big headed ant (*Pheidole megacephala*), the tropical fire ant (*Solenopsis geminata*), the crazy ant (*Paratrechina longicornis*), and the ghost ant (*Tapinoma melanocephalum*). Argentine ants have been recorded throughout the Whangarei, Whangarei Port and Marsden Point areas (Landcare Research 2006, L. Maria *pers. comm.*, D. Ward *pers. obs.*).

### 4.2 Sites of High Establishment Risk

Based on a previous risk assessment for the red imported fire ant (*Solenopsis invicta*), high risk goods were classified as untreated soil, sea containers (at both wharves and transitional facilities), packing materials, vehicles, used car parts, used machinery, used electrical equipment, bark and hay (MAF 2002). Harris et al. (2005) was used to obtain the frequency of detection of three major invasive ant species (the tropical fire ant (*Solenopsis geminata*), the crazy ant (*Paratrechina longicornis*), and the ghost ant (*Tapinoma melanocephalum*)) from different goods. The data showed fresh produce, containers, and personal effects made up 75% of detection records (Harris et al. 2005). This information is summarised in Table 1.

Thus, the subsequent prioritisation of sites is based on the information of risk goods and pathways found within MAF (2002) and Harris et al. (2005). Business categories that were most likely to be associated with these risk goods were determined (Appendix 3), and sites from the high and medium categories are compiled in Appendix 4.

Seventeen sites were given a high risk ranking, and 163 sites a medium risk ranking (Appendix 4). High risk sites are based around businesses that are most likely to supply and frequently move bark, garden material, and fresh produce (e.g. fruit, flowers, vegetables). Sites of medium risk are based around plant material (lawn turf, trees), rubbish disposal (rubbish bins, scrap metal), landscape

suppliers (including orchard suppliers, garden centres), timber and wood products, and camping grounds.

### 4.3 Sites of High Ecological Priority

Forty five sites were ranked, and twelve were given a high priority ranking (Appendix 5). Sites are ranked in an approximate order of risk within the high-medium-low priority framework, on the basis of two factors. First, sand, gumlands and wetland habitat had priority over forest. Second, sites with higher visitor numbers are given higher priority.

Many of these sites cover a large area and contain a number of locations that could be sampled. Surveillance should be focused around locations that are most associated with humans. For example, road ends, picnic grounds, rest stops, entrances to walkways, houses and holiday houses. In such situations, it is recommended to continue to use direct searching and an approximate 30 minute time period. However, in order to cover a large area, use a series of 30-minute time periods – with all ants collected in one 30-minute period placed into one vial of ethanol.

Sixteen offshore islands were also included in the initial ranking obtained from DOC staff. However, I have separated them from the mainland sites because they present additional logistical demands, and consequently are unlikely to be visited over the 2006-2007 summer period. It is suggested that the islands are either surveyed for invasive ants as part of ongoing DOC work, or as a separate project.

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## 5. Recommendations

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### 5.1 Surveillance and Monitoring Strategy

Sites with a high risk or high priority rank should be surveyed first. This includes nine sites of high risk points of entry, seventeen sites of high risk, and twelve sites of high priority. A total of thirty-eight sites. Sampling should be through direct searching for ant species, using an aspirator to collect ant specimens. Approximately 30 minutes should be spent at each site.

The two goals identified in the NRC regional pest management strategy for the long term management of invasive ants in Northland are: 1) to prevent their spread into sites of significant ecological value, and 2) to restrict their spread to other areas of human habitation.

To achieve these two goals, it is recommended that in subsequent years of surveillance, high risk/high priority sites are *always* visited before other sites of lower priority. Additionally, a mixture of medium risk and medium priority sites are then selected, depending on the amount of remaining resources.

It may be useful to split the total number of medium risk/medium priority sites, and survey a certain number of sites each year (e.g. Table 2). Such a strategy may be best determined after the first year of the surveillance program has been completed.

Argentine ants are currently the invasive ant species of most concern in Northland (and New Zealand); they are already widespread, continue to spread rapidly at several spatial scales, and have well documented ecological and economic impacts overseas. Although Argentine ants are already widespread throughout the Northland region (Appendix 6), they appear not to have spread into many areas considered of significant ecological value. Therefore, it could be argued that the long term goal (goal one) of the regional pest management strategy can be achieved. However, this may necessitate a re-focus of surveillance effort, towards sites of ecological value rather than sites of establishment risk.

Advocacy and education of businesses and residents in the Northland region will also play a key role in the continued surveillance and management of invasive ant species in Northland. Advocacy will be particularly important at medium and low priority sites because many of these medium/low sites will

not be surveyed regularly. Advocacy will be also useful for targeting a large number of industrial sites (areas of economic significance), that cannot be surveyed because of limited resources.

## 5.2 Caveats

Rankings of sites/categories have been on the basis of expert experience and what is known about invasive ant species. Unfortunately, knowledge of invasive ant species is often limited, especially concerning their movement/dispersal and association with humans.

Therefore, this prioritisation process must be put in context - all sites have the potential to have invasive ants, but the probability of this occurring depends on the site being associated with the movement of risk goods and the volume/frequency of that association. But also note that risk classifications are not static. New high risk sites can be built, and changes at a site may result change its risk status. Furthermore, there is no correct definition of a 'risk good', this may vary between species, and invasive ant species are generalists and can thus tolerate a wide range of transport mediums and conditions.

As a consequence of this uncertainty, individual expert opinions may differ in the rankings of different sites and categories. However, such differences in opinion should be satisfied in a flexible surveillance strategy that is based on a strong long-term goal, and through advocacy of businesses and residents.

To further assist in developing a longer-term surveillance strategy and optimising the process of site prioritisation, the results of this surveillance program should be briefly evaluated after the first year.

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Table 1. List of pathways and goods often associated with invasive ant species and deemed 'high risk goods', ranked in order of decreasing risk. Information from MAF (2002, *Solenopsis invicta*), and Harris et al. (2005, *Solenopsis geminata*, *Paratrechina longicornis*, *Tapinoma melanocephalum*).

| Reference            | Pathways and goods   |
|----------------------|--|
| MAF (2002)           | untreated soil<br>sea containers - wharf inspected or transitional facility inspected<br>packing materials<br>vehicles<br>used car parts<br>used machinery<br>non-wooden building materials<br>untreated and non-manufactured wooden building material<br>bark<br>hay<br>used electrical equipment<br>personal effects (unaccompanied baggage)<br>animal containers<br>packaging materials-air<br>packaging materials-sea - transitional facility inspected<br>nursery stock (dormant bulbs)<br>manufactured wooden building materials |
| Harris et al. (2005) | fresh produce<br>containers (sea + air)<br>personal effects<br>air passenger baggage<br>cut flowers<br>timber (+wood products)<br>machinery<br>plants  |

Table 2. A recommended schedule of site prioritisation over multiple years, splitting “medium” sites across time.

|                         | Year 1 | Year 2 | Year 3 | Year 4 |
|-------------------------|--------|--------|--------|--------|
| All High priority sites | √      | √      | √      | √      |
| Medium: sites 1-20      | √      |        |        | √      |
| Medium: sites 21-40     |        | √      |        |        |
| Medium: sites 41-60     |        |        | √      |        |

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## 8. Glossary

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|                       |  |
|-----------------------|--|
| High risk             | sites that have an association with, and movement of, risk goods. As a consequence of this association, these sites have a higher probability of acting as a source for the spread of invasive ants, or as a site of establishment.            |
| High value            | sites that have a significant biodiversity and conservation value to Northland.  |
| HRSS                  | high risk site surveillance. The deliberate targeting of trade pathways and high risk areas for possible incursions of invasive organisms (Murphy 2004).   |
| Invasive ant species  | an ant species that does not naturally occur in a region, and has been introduced to the region through the actions of humans. The terms of exotic, alien and non-indigenous are treated as synonymous with invasive.                          |
| Points of entry       | sites where goods are unloaded into a site which is the first point of entry into New Zealand. These sites include seaports, airports and transitional facilities. These sites are typically where the majority of surveillance is undertaken. |
| Risk goods            | any goods considered higher than average risk for the transport of invasive ants into New Zealand [and also within New Zealand] (Murphy 2004).   |
| Surveillance          | a planned process targeted to detect a particular pest.  |
| Transitional facility | any site where accredited people devan containers (Murphy 2004).   |

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## 9. Appendices

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### Appendix 1. Endemic and invasive ant species recorded from Northland and New Zealand (source Ward 2005).

| Endemic                           | Invasive                             | Invasive                           |
|-----------------------------------|--------------------------------------|------------------------------------|
| In Northland +NZ                  | In Northland + NZ                    | Not present in Northland but in NZ |
| <i>Amblyopone saundersi</i>       | <i>Amblyopone australis</i>          | <i>Cardiocondyla minutior</i>      |
| <i>Discothyrea antarctica</i>     | <i>Doleromyrma darwiniana</i>        | <i>Hypoponera punctatissima</i>    |
| <i>Heteroponera brounii</i>       | <i>Hypoponera eduardi</i>            | <i>Monomorium pharaonis</i>        |
| <i>Huberia brounii</i>            | <i>Iridomyrmex</i> sp.               | <i>Monomorium sydneyense</i>       |
| <i>Huberia striata</i>            | <i>Linepithema humile</i>            | <i>Pheidole megacephala</i>        |
| <i>Monomorium antarcticum</i>     | <i>Monomorium fieldi</i> (antipodum) | <i>Pheidole proxima</i>            |
| <i>Monomorium smithii</i>         | <i>Ochetellus glaber</i>             | <i>Rhytidoponera metallica</i>     |
| <i>Pachycondyla castanea</i>      | <i>Orectognathus antennatus</i>      | <i>Solenopsis</i> sp.              |
| <i>Pachycondyla castaneicolor</i> | <i>Paratrechina</i> sp.A             |                                    |
| <i>Prolasius advenus</i>          | <i>Paratrechina</i> sp.B             |                                    |
|                                   | <i>Pheidole rugosula</i>             |                                    |
|                                   | <i>Pheidole vigilans</i>             |                                    |
|                                   | <i>Ponera leae</i>                   |                                    |
|                                   | <i>Rhytidoponera chalybaea</i>       |                                    |
|                                   | <i>Strumigenys perplexa</i>          |                                    |
|                                   | <i>Strumigenys xenos</i>             |                                    |
|                                   | <i>Technomyrmex albipes</i>          |                                    |
|                                   | <i>Tetramorium bicarinatum</i>       |                                    |
|                                   | <i>Tetramorium grassii</i>           |                                    |

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**Appendix 2. High risk points of entry and transitional facilities in Northland. All sites are in the Whangarei area, except for the two Opua sites. Grid references of sites (NZMG and latitude/longitude, WGS84 datum - in decimal degrees) were obtained using Topomap® software. It should be noted that grid references are approximate because Topomap® does not contain references to street numbers, but only streets/roads.**

| Site                       | Address             | Site Used For         | NZMG East | NZMG North | Longitude | Latitude |
|----------------------------|---------------------|-----------------------|-----------|------------|-----------|----------|
| Marsden Point Oil Refinery | Marsden Point Rd    | Wharf                 | 2646035   | 6594775    | 174.499   | -35.838  |
| Doclands                   | 211-219 Port Rd     | Boat Yard             | 2631920   | 6605680    | 174.340   | -35.742  |
| Norsand                    | 10 Fraser Street    | Boat Yard             | 2631920   | 6605680    | 174.340   | -35.742  |
| McRae's Engineering        | 7 Hewlett St        | Wharf/Industry        | 2631920   | 6605680    | 174.340   | -35.742  |
| Ray Roberts Marine         | Riverside Drive     | Boat Yard             | 2630725   | 6607790    | 174.327   | -35.723  |
| Opua Marina                | Opua                | Wharf                 | 2612725   | 6653560    | 174.121   | -35.313  |
| Ashby's Boat Yard          | Baffin Street, Opua | Boat Yard             | 2612725   | 6653560    | 174.121   | -35.313  |
| Toll Consolidated          | Porowini Ave        | Transitional Facility | 2630035   | 6606910    | 174.319   | -35.731  |
| United Carriers            | 4 Hewlett St        | Transitional Facility | 2631920   | 6605680    | 174.340   | -35.742  |

**Appendix 3. Risk categories obtained from the Telecom Northland Yellow Pages 2006/07.  
Categories not listed are considered of negligible risk.**

| <b>Risk</b>                       | <b>Category</b>                          | <b>Page</b> |
|-----------------------------------|--|-------------|
| <b>High</b>                       | Bark products                            | 67          |
|                                   | Garden and Horticultural Suppliers       | 251         |
|                                   | Fruit and Vegetable Wholesalers          | 235         |
|                                   | Packhouse-Flowers, Fruit and Vegetables  | 354         |
| <b>Medium</b>                     | Lawn and Turf                            | 316         |
|                                   | Tree Services                            | 480         |
|                                   | Rubbish Bin Hire/Waste Disposal          | 412/499     |
|                                   | Scrap Metal Dealers                      | 419         |
|                                   | Orchardists' Suppliers                   | 351         |
|                                   | Landscape Contracting and Supplies       | 312         |
|                                   | Timber Merchants                         | 468         |
|                                   | Hire-plants                              | 279         |
|                                   | Garden Centres and Nurseries-Retail      | 249         |
| Holiday Parks and Camping Grounds | 279                                      |             |
| <b>Low</b>                        | Aero clubs                               | 44          |
|                                   | Automotive Parts, Truck Parts            | 58/483      |
|                                   | Backpackers                              | 65          |
|                                   | Boat Charter, Repairs                    | 81/83       |
|                                   | Building Suppliers                       | 103         |
|                                   | Bus Charters                             | 105         |
|                                   | Caravan Rentals                          | 117         |
|                                   | Carriers and Cartage                     | 127         |
|                                   | Earthmovers                              | 190         |
|                                   | Farm Supplies & Services, Machinery      | 212/213     |
|                                   | Fishing Trips                            | 225         |
|                                   | Forestry Equipment                       | 230         |
|                                   | Freight Forwarders                       | 234         |
|                                   | Fruit and Vegetable Growers, Wholesalers | 235         |
|                                   | Furniture Removals                       | 239         |
|                                   | Garden Maintenance                       | 251         |
|                                   | Importers                                | 288         |
|                                   | Lawn mowing Services                     | 317         |
|                                   | Machinery Importers and Dealers          | 328         |
|                                   | Motels and Lodges                        | 340         |
|                                   | Packaging Machinery                      | 354         |
|                                   | Pallet Hire, Manufacturing               | 358         |
|                                   | Port Services                            | 379         |
|                                   | Quarries, Stone and Rock Merchants       | 385/446     |
|                                   | Recycling                                | 393         |
|                                   | Rental Vehicles                          | 395         |
|                                   | Sawmills                                 | 468         |
|                                   | Second-hand Dealers                      | 421         |
|                                   | Shipping Agents                          | 433         |
|                                   | Storage                                  | 446         |
|                                   | Supermarkets and Grocers                 | 451         |
|                                   | Tours and Sightseeing                    | 471         |
|                                   | Tree and Shrub Seeds                     | 483         |

**Appendix 4. High and medium risk sites in Northland. Grid references of sites (NZMG and latitude/longitude, WGS84 datum - in decimal degrees) were obtained using Topomap® software. It should be noted that grid references are approximate because Topomap® does not contain references to street numbers, but only streets/roads.**

| Category (Yellow pg) + Site                                | Address                   | Phone       | District   | NZMG East | NZMG North | Longitude | Latitude | #  |
|--|---------------------------|-------------|------------|-----------|------------|-----------|----------|----|
| <b>High Risk</b>   |                           |             |            |           |            |           |          |    |
| <b>Bark products (p 67)</b>                                |                           |             |            |           |            |           |          |    |
| Greenfingers Growing mixes Ltd                             | 500 Kamo Rd               | 435 1488    | Whangarei  | 2628175   | 6613000    | 174.298   | -35.676  | 1  |
| Greenfingers Growing mixes Ltd                             | Kioreroa Rd               | 438 5264    | Whangarei  | 2628175   | 6613000    | 174.298   | -35.676  | 2  |
| <b>Garden and Horticultural Suppliers (p 251)</b>          |                           |             |            |           |            |           |          |    |
| Poppa's Garden Supplies                                    | 19 Rewa rewa Rd           | 438 6984    | Whangarei  | 2629110   | 6604540    | 174.310   | -35.752  | 3  |
| Kericell Nurseries   | 1589 State Hwy 10 RD3     | 407 7996    | Kerikeri   | 2597140   | 6662660    | 173.948   | -35.233  | 4  |
| Pacific Growers  |                           | 0800 777999 |            | ?         |            |           |          | 5  |
| Veg Gro Supplies Ltd                                       | 43 Porowini Ave           | 438 1045    | Whangarei  | 2630035   | 6606910    | 174.319   | -35.731  | 6  |
| Cover n Gro  | 13 Parkland Cre, Kamo     | 437 3196    | Whangarei  | 2628150   | 6613000    | 174.298   | -35.676  | 7  |
| Waipapa landscape supplies                                 | State Hwy 10, Waipap      | 407 6668    | Waipapa    | 2594650   | 6665325    | 173.921   | -35.209  | 8  |
| <b>Fruit and Vegetable Growers and Wholesalers (p 235)</b> |                           |             |            |           |            |           |          |    |
| Delta Produce co-op  | 97 Jervois St             | 439 0717    | Dargaville | 2590400   | 6585050    | 173.884   | -35.933  | 9  |
| Manna wholesalers  | 110 George St             | 027 4509472 | Hikurangi  | 2627300   | 6619950    | 174.287   | -35.614  | 10 |
| Turners & Growers  | 249 Port Rd               | 459 8500    | Whangarei  | 2630700   | 6607050    | 174.327   | -35.729  | 11 |
| Wholesale fresh, Redwood Centre                            | State Highway 10          | 407 1136    | Kerikeri   | 2597140   | 6662660    | 173.948   | -35.233  | 12 |
| <b>Packhouse-Flowers, Fruit and Vegetables (p 354)</b>     |                           |             |            |           |            |           |          |    |
| Alcom Limited  | 517 Kerikeri Rd           | 407 1354    | Kerikeri   | 2598650   | 6662950    | 173.965   | -35.230  | 13 |
| Apotu Carnation Gardens                                    | 45 Apotu Rd Kauri         | 435 3101    | Whangarei  | 2628000   | 6616250    | 174.295   | -35.647  | 14 |
| Golden Mile Fruitpackers Ltd                               | Austin Rd                 | 438 2326    | Whangarei  | 2625750   | 6605500    | 174.272   | -35.744  | 15 |
| Satara Glenbervie  | cnr Ngunguru & Maruata Rd | 437 3003    | Whangarei  | 2633350   | 6613800    | 174.355   | -35.668  | 16 |
| Satara Poroti  | cr McBeth & Mangakahia Rd | 434 6553    | Whangarei  | 2633350   | 6613800    | 174.355   | -35.668  | 17 |
| <b>Medium Risk</b>   |                           |             |            |           |            |           |          |    |
| <b>Lawn and Turf (p 316)</b>                               |                           |             |            |           |            |           |          |    |
| GreenGables Landscape                                      | 18 Rewa rewa Rd           | 459 1108    | Whangarei  | 2629110   | 6604540    | 174.310   | -35.752  | 1  |
| Recreational Services Ltd                                  | PO Box 473                | 437 3440    | Whangarei  | ?         |            |           |          | 2  |
| North Coast Turf & Lawns                                   | Ormiston Rd Waipua RD 2   | 432 1386    | Waipua     | 2636100   | 6583740    | 174.391   | -35.939  | 3  |

|  |                           |              |         |         |         |         |    |
|--|---------------------------|--------------|---------|---------|---------|---------|----|
| Rapid Lawn Northland Ltd                       | Saleyard Rd Kauri 1       | 435 3119     | 2628025 | 6612425 | 174.296 | -35.681 | 4  |
| <b>Tree Services (p 480)</b>                   |                           |              |         |         |         |         |    |
| B.Js Shelter Belt Trimmers                     | 33 Escalona St Kamo       | 435 6285     | 2627725 | 6612325 | 174.293 | -35.682 | 5  |
| Branching Out Treecare Ltd                     | PO Box 1323               | 436 4466     | ?       |         |         |         | 6  |
| Cowley's Hire Centres                          | 54 Commerce St            | 438 3613     | ?       |         |         |         | 7  |
| Far North Contracting Ltd                      | Kaitaia                   | 406 7971     | 2534400 | 6676750 | 173.258 | -35.111 | 8  |
| Hooker Contracting                             | PO Box 4131 Kamo          | 435 1310     | 2627975 | 6613025 | 174.296 | -35.675 | 9  |
| North End Tree Services                        | 160 Gt North Rd RD 1 Kamo | 435 2662     | 2627725 | 6612325 | 174.293 | -35.682 | 10 |
| Northpower Contracting                         | 28 Mt Pleasant Rd         | 430 1803     | ?       |         |         |         | 11 |
| Park Shelter Trimming Services                 | Whangarei RD 9            | 434 7215     | ?       |         |         |         | 12 |
| R & J Mulching Services Ltd                    | Johnson Rd Hukerenui RD2  | 433 9868     | 2621350 | 6632250 | 174.219 | -35.504 | 13 |
| Shelter Trim Ltd                               | Tokatoka Rd RD 2          | 439 2142     | 2597800 | 6571150 | 173.968 | -36.057 | 14 |
| Special Branch Tree Services                   | PO Box 175                | 434 3814     | ?       |         |         |         | 15 |
| Stump Chipping Ltd                             | Whangarei Heads Rd 4      | 436 3538     | 2646425 | 6599525 | 174.502 | -35.795 | 16 |
| The Branch Manager                             | State Highway 14 RD 9     | 430 8078     | ?       |         |         |         | 17 |
| The Stump Grinding Man                         | PO Box 3238 Onerahi       | 027 4903678  | ?       |         |         |         | 18 |
| Total Tree Trimming Ltd                        | Marlborough Rd Tutamoe    | 439 6482     | 2569925 | 6616325 | 173.654 | -35.653 | 19 |
| Tree Chipping Services                         | 1 Mahanga Rd Pataua       | 436 1881     | 2648575 | 6607925 | 174.524 | -35.719 | 20 |
| <b>Rubbish Bin Hire/Waste Disposal (p 412)</b> |                           |              |         |         |         |         |    |
| Dargaville Tidy Bins Ltd                       | Awakino Rd Dargaville     | 439 8768     | 2589320 | 6584625 | 173.872 | -35.937 | 21 |
| East West Waste Ltd                            | Puketona Junction RD 3    | 0800 492 783 | 2598355 | 6654875 | 173.963 | -35.303 | 22 |
| EasyWay Bins                                   | 22 Hill Crest Rd Kaitaia  | 408 2594     | 2534400 | 6676750 | 173.258 | -35.111 | 23 |
| Kiwi Bins                                      | Waipu Caves Rd Waipu      | 435 2259     | 2636100 | 6583740 | 174.391 | -35.939 | 24 |
| Northwaste Ltd                                 | PO Box 11116 Whangarei    | 438 0802     | ?       |         |         |         | 25 |
| Parkes Bins                                    | 150-154 Lower Port Rd     | 438 6984     | 2631000 | 6605150 | 174.330 | -35.747 | 26 |
| Waste Management NZ Ltd                        | PO Box 910                | 438 5585     | ?       |         |         |         | 27 |
| Waste Works Ltd                                | 51 Rankin St              | 401 1475     | 2583420 | 6642850 | 173.800 | -35.413 | 28 |
| Wastecare Ltd                                  | 150-154 Lower Port Rd     | 438 6039     | 2631000 | 6605150 | 174.330 | -35.747 | 29 |
| <b>Scrap Metal Dealers (p 419)</b>             |                           |              |         |         |         |         |    |
| Kamo Scrap Metals Ltd                          | Hiko Rd RD 6 Kamo         | 435 2488     | 2627725 | 6612325 | 174.293 | -35.682 | 30 |
| Little River Transport Ltd                     | Beach Rd Dargaville       | 021 1693564  | 2588425 | 6583775 | 173.862 | -35.944 | 31 |
| Mega Metals                                    | 34 Rewa Rewa Rd           | 438 9887     | 2629110 | 6604540 | 174.310 | -35.752 | 32 |
| Northland Scrap & Coal Ltd                     | 22 Kaka St                | 438 6489     | ?       |         |         |         | 33 |
| Quest Metals                                   | 37 Port Rd                | 438 9886     | 2632290 | 6605445 | 174.345 | -35.744 | 34 |

**Orchardists' Suppliers (p 351)**

|  |                            |          |                |         |         |         |         |    |
|--|----------------------------|----------|----------------|---------|---------|---------|---------|----|
| Lake Omapere orchards                            | Te Pua Rd RD 2             | 405 2356 | Kaikohe        | 2584520 | 6644780 | 173.812 | -35.395 | 35 |
| <b>Landscpe Contracting and Supplies (p 312)</b> |                            |          |                |         |         |         |         |    |
| Blue Nikau LTD                                   | RD3 Whangarei              | 434 3077 | Whangarei      | ?       | 6584850 | 174.427 | -35.928 | 36 |
| Central Mountfield quarry                        | Mountfield Rd              | 432 0606 | Waipu          | 2639375 |         |         |         | 37 |
| Cowleys  | 54 Commerce St             | 438 3613 | Whangarei      | ?       |         |         |         | 38 |
| Diesel & Dirt Landscape supplies                 | SH 14 Maungatapere         | 434 7777 |                | 2619850 | 6604400 | 174.207 | -35.755 | 39 |
| Garden Works                                     | 15 Weir St, Onerahi        | 434 3962 | Whangarei      | 2633350 | 6602575 | 174.357 | -35.769 | 40 |
| Garden Works                                     | Sands Rd Tikipunga         | 437 6706 |                | 2631900 | 6612475 | 174.339 | -35.680 | 41 |
| Gourmet Gardens                                  | Loop Rd                    | 432 2456 |                | 2628425 | 6600400 | 174.303 | -35.790 | 42 |
| Graham Parkes Ltd                                | 19 Rewa rewa Rd            | 438 6984 | Whangarei      | 2629110 | 6604540 | 174.310 | -35.752 | 43 |
| Groundworks landscaping                          | 6 Pine Rd, Ngunguru        | 434 3066 | Ngunguru       | 2646445 | 6617305 | 174.499 | -35.635 | 44 |
| Landscapes                                       | 1 Manawaroa Rd             | 403 8171 | Russell        | 2613025 | 6659285 | 174.123 | -35.261 | 45 |
| Landscaping rocks                                | Puhipuhi Rd                | 433 9658 |                | 2626400 | 6634775 | 174.274 | -35.480 | 46 |
| Magivers Landcare                                | 35 Apotu Rd RD 1           | 435 1935 | Kamo           | 2626550 | 6618450 | 174.279 | -35.627 | 47 |
| Manu Lanscaping                                  | Hollington Way RD 10       | 434 6689 |                | ?       |         |         |         | 48 |
| Northern subtropical landscapes                  | 1 Tree point Rd            | 432 7048 | Ruakaka        | 2640135 | 6588765 | 174.434 | -35.893 | 49 |
| Northland park care                              | Snooks Rd RD 9             | 434 6688 | Whangarei      | 2617550 | 6602525 | 174.182 | -35.772 | 50 |
| Palmo  | Wairoa Rd                  | 407 9293 | Kerikeri       | ?       |         |         |         | 51 |
| The Woodlot                                      | Waipapa Rd                 | 407 0726 | Waipapa        | 2594375 | 6665600 | 173.918 | -35.206 | 52 |
| Waipapa landscape Supplies                       | State Hwy 10               | 407 6668 | Waipapa        | 2594375 | 6665600 | 173.918 | -35.206 | 53 |
| <b>Timber Mechants (p 468)</b>                   |                            |          |                |         |         |         |         |    |
| Ancient Kauri Kingdom                            | 229 State Hwy 1 Awani      | 406 7172 | Awanui         | 2534660 | 6684115 | 173.261 | -35.044 | 54 |
| BBS Timbers Ltd                                  | 27 Kioreroa Rd Whgri       | 430 0455 | Whangarei      | 2629950 | 6604535 | 174.319 | -35.752 | 55 |
| Benchmark Building Supplies                      | Commerce St                | 438 4579 | Whangarei      | ?       |         |         |         | 56 |
| Benchmark Building Supplies                      | Mangakahia Rd              | 401 5089 | Kaikohe        | 2584530 | 6641780 | 173.812 | -35.422 | 57 |
| Benchmark Building Supplies                      | Kauri Branch Main Rd Kauri | 435 0377 |                |         |         |         |         | 58 |
| Bunnings Trade                                   | State Hwy 1, Kauri         | 435 0377 | Whangarei      | 2628000 | 6616250 | 174.295 | -35.647 | 59 |
| Cains Timber Co NZ Ltd                           | Waipanga Rd                | 435 1072 | Whangarei      | 2627975 | 6613025 | 174.296 | -35.675 | 60 |
| Croft Pole & Timber                              | SH1 Kauri Postal RD1 Kamo  | 435 5040 |                | 2628025 | 6612425 | 174.296 | -35.681 | 61 |
| Demolition Supermarket                           | 28 Kioreroa Rd             | 438 2887 | Whangarei      | 2629950 | 6604535 | 174.319 | -35.752 | 62 |
| Earth & Trees Sawmilling                         | Ryan Rd RD2                | 475 5555 | Waipu          | 2638905 | 6574140 | 174.424 | -36.025 | 63 |
| Grand Pine Enterprises NZ Ltd                    | Sir William Hale Crescent  | 404 0453 |                | ?       |         |         |         | 64 |
| Herman Pacific                                   | 110 Foundry Rd Svdle       | 426 5475 | Hibiscus Coast | ?       |         |         |         | 65 |
| Herman Timber Ltd                                | Factory Lane Hikur         | 433 8555 |                | ?       |         |         |         | 66 |
| Juken NZ Ltd                                     | Whangatane Dr              | 408 9121 |                | ?       |         |         |         | 67 |
| Just Macro                                       | 127 Ford Rd Mingto         | 431 8335 |                | 2627000 | 6561200 | 174.294 | -36.143 | 68 |
| Kaihu Valley Sawmill Ltd                         | Kaiwi Lakes Rd Maman       | 439 0833 |                | 2568815 | 6598265 | 173.644 | -35.816 | 69 |

|  |                          |             |               |         |         |         |         |     |
|--|--------------------------|-------------|---------------|---------|---------|---------|---------|-----|
| Mac Direct   | 15b Rewa rewa Rd         | 4381727     | Whangarei     | 2629110 | 6604540 | 174.310 | -35.752 | 70  |
| Michelsen Timber                                   | Huanui Rd Glenbervie     | 437 5845    | Glenbervie    | 2633100 | 6615000 | 174.352 | -35.657 | 71  |
| Mitre 10   | Whangarei Kamo Rd Regent | 4383119     |               | 2628025 | 6612425 | 174.296 | -35.681 | 72  |
| Motukiore Timber Co                                | Motukiore Rd Horek       | 401 9197    |               | ?       |         |         |         | 73  |
| Mt Pokaka Timber Products Ltd                      | Bulls Rd                 | 407 7271    |               | ?       |         |         |         | 74  |
| Northland Kauri Ltd                                | State Hwy 10 Oromahoe    | 405 9612    | Kerikeri      | 2599775 | 6652850 | 173.979 | -35.321 | 75  |
| NorthPine Ltd                                      | 34 Cove Rd               | 432 1155    | Waipu         | 2641100 | 6578550 | 174.447 | -35.985 | 76  |
| Northsawn Lumber                                   | 458 Marsden Point Rd,    | 432 7078    | Ruakaka       | 2642025 | 6590650 | 174.455 | -35.876 | 77  |
| NZ Green Pine Ltd                                  | Lot 12 Marsden Point Rd  | 433 0048    | Ruakaka       | 2642025 | 6590650 | 174.455 | -35.876 | 78  |
| Palms Timber Yard                                  | State Hwy 1F Awanui      | 021 3411229 | Awanui        | 2534660 | 6684115 | 173.261 | -35.044 | 79  |
| Pyac Timber  | Kohukohu                 | 409 5754    | Kaitiaki      | 2560000 | 6648700 | 173.542 | -35.362 | 80  |
| Rosvall ITM Building Centre                        | Kioreoro Rd              | 438 9359    | Whangarei     | 2629950 | 6604535 | 174.319 | -35.752 | 81  |
| Rosvall Sawmill Ltd                                | Whareora Rd 5            | 437 5509    | Whangarei     | 2635900 | 6610850 | 174.384 | -35.694 | 82  |
| Sheppard Sawmills Ltd                              | Ararua Rd R D 2 Matko    | 431 7108    |               | 2616300 | 6565700 | 174.174 | -36.104 | 83  |
| Timber Enterprises                                 | State Hwy 10 Oromahoe    | 408 7991    | Kerikeri      | 2599775 | 6652850 | 173.979 | -35.321 | 84  |
| Trilog Treework                                    | State Hwy 12             | 431 9181    |               | ?       |         |         |         | 85  |
| Topuni Timber Ltd                                  | Schiska Rd, Topuni, SH1  | 431 2855    |               | 2642125 | 6553025 | 174.463 | -36.215 | 86  |
| <b>Hire-plants (p 279)</b>                         |                          |             |               |         |         |         |         |     |
| Living décor                                       | 63E Great North Rd       | 435 5964    | Kamo          | 2628025 | 6612425 | 174.296 | -35.681 | 87  |
| Plans for occasions                                | 9 Aratiatia Pl           | 437 0708    | Whangarei     | ?       |         |         |         | 88  |
| <b>Garden Centres and Nurseries-Retail (p 249)</b> |                          |             |               |         |         |         |         |     |
| Alter-natives Wholesale                            | 571 Ormiston Rd          | 432 1333    | Waipu         | 2636100 | 6583740 | 174.391 | -35.939 | 89  |
| Bream Bay Landscape Centre                         | One tree point rd RD1    | 432 7048    | Ruakaka       | 2640135 | 6588765 | 174.434 | -35.893 | 90  |
| Doubtless Bay Garden Centre                        | Walters Way CoopB        | 406 0212    | Coopers Beach | 2557355 | 6689710 | 173.509 | -34.992 | 91  |
| Duck Creek Garden                                  | 29 Gladstone St Dargv    | 439 8386    | Dargaville    | 2589320 | 6584625 | 173.872 | -35.937 | 92  |
| Forest floor                                       | Mangakahia Rd            | 434 7216    |               | 2613400 | 6606425 | 174.136 | -35.737 | 93  |
| Gala's Garden                                      | Kapiro Rd Kerik          | 407 5941    | Kerikeri      | 2593850 | 6667275 | 173.912 | -35.191 | 94  |
| Greens Garden Nursery                              | Kioreoro Rd Whgri        | 438 9389    | Whangarei     | 2629950 | 6604535 | 174.319 | -35.752 | 95  |
| Harvies Plant Warehouse                            | Kerikeri Rd Kerik        | 407 6541    | Kerikeri      | 2597420 | 6663545 | 173.951 | -35.225 | 96  |
| In 2 Plants  | Puhipuhi Rd R D 2        | 433 9658    | Hikurangi     | 2625900 | 6628325 | 174.270 | -35.538 | 97  |
| Kerikeri Flora                                     | 139a Ness Rd             | 407 9066    | Waipapa       | 2592775 | 6668025 | 173.900 | -35.185 | 98  |
| Kerikeri Plant Production                          | Riddell Rd Kerik         | 407 9448    | Kerikeri      | 2598140 | 6661925 | 173.959 | -35.239 | 99  |
| Koanga Organic Garden Centre                       | RD 2 Mngto               | 431 2732    | Maungaturoto  | 2633525 | 6565175 | 174.366 | -36.106 | 100 |
| Kwan Garden Creations                              | 334 Kerikeri Rd          | 407 6845    | Kerikeri      | 2597420 | 6663545 | 173.951 | -35.225 | 101 |
| Lemonwood GardenWerx                               | Main Rd Awanui           | 406 7039    | Awanui        | 2534660 | 6684115 | 173.261 | -35.044 | 102 |
| Longreach Tree Nursery                             | Onerahi                  | 436 0997    | Whangarei     | 2633630 | 6602980 | 174.360 | -35.766 | 103 |
| Loop Road Nursery                                  | 113 Loop Rd Otaka        | 432 2456    | Otaika        | 2628410 | 6601140 | 174.302 | -35.783 | 104 |

|  |                                  |          |              |         |         |         |         |     |
|--|----------------------------------|----------|--------------|---------|---------|---------|---------|-----|
| Oakleigh Nurseries                               | State Highway 1                  | 432 2542 | Oakleigh     | 2629435 | 6595715 | 174.315 | -35.832 | 105 |
| Palmo  | Wairoa Rd Kerik                  | 407 9293 | Kerikeri     | ?       |         |         |         | 106 |
| Palmers  | Cnr Water St & Central Ave       | 430 4070 | Whangarei    | 2629925 | 6608900 | 174.318 | -35.713 | 107 |
| Rainbow @ Redwoods                               | State Highway 10 Kerik           | 407 9148 | Kerikeri     | 2597420 | 6663545 | 173.951 | -35.225 | 108 |
|  | Cnr Aurerere Beach Rd &          |          |              |         |         |         |         |     |
| River Of Life Garden Centre                      | State Hwy 10                     | 406 0813 | Taipa        | 2549315 | 6689970 | 173.421 | -34.991 | 109 |
| Sciadopitys                                      | 460 Maunu Rd                     | 438 9715 | Whangarei    | 2625875 | 6605450 | 174.274 | -35.745 | 110 |
| Smith's Garden Centre                            | 414 Kerikeri Rd Kerik            | 407 8550 | Kerikeri     | 2597420 | 6663545 | 173.951 | -35.225 | 111 |
| South Pacific Palms                              | Kerikeri Rd Kerikeri             | 407 8899 | Kerikeri     | 2597420 | 6663545 | 173.951 | -35.225 | 112 |
| Subtropica                                       | Massey Rd                        | 432 0018 | Waipu        | 2642275 | 6573250 | 174.461 | -36.032 | 113 |
| Tangihua Trees                                   | Tangihua Rd                      | 432 3800 | Tangihua     | 2617810 | 6594215 | 174.186 | -35.847 | 114 |
| Trees Company Nursery                            | Pukepoto Rd Kaita                | 408 0153 | Kaitaia      | 2533625 | 6674625 | 173.250 | -35.130 | 115 |
| Twin Palms Succulent Nursery                     | 45 Apotu Rd Kauri RD 1           | 435 1935 | Whangarei    | 2628000 | 6616250 | 174.295 | -35.647 | 116 |
|  | 461 Whangarei Heads Rd           |          |              |         |         |         |         |     |
| Waikaraka Nursery                                | Waikr RD 4                       | 436 1212 | Whangarei    | 2635800 | 6603925 | 174.384 | -35.757 | 117 |
| Waipu Plants                                     | 503 Heimsdale Rd                 | 432 1503 | Waipu        | 2638275 | 6581500 | 174.415 | -35.959 | 118 |
| West End Nursery                                 | 15 Normanby St Dargv             | 439 5996 | Dargaville   | 2589320 | 6584625 | 173.872 | -35.937 | 119 |
| Wharepuke Nursery                                | Stone Store Hill 190 Kerikeri Rd | 407 8933 | Kerikeri     | 2597420 | 6663545 | 173.951 | -35.225 | 120 |
| <b>Holiday Parks and Camping Grounds (p 279)</b> |                                  |          |              |         |         |         |         |     |
| Ahipara Motor Camp                               | Takahe Rd Ahipara                | 409 4864 | Ahipara      | 2525245 | 6670785 | 173.158 | -35.165 | 121 |
| Alpha Motel & Holiday Park                       | 34 Tarewa Rd                     | 438 6600 | Whangarei    | ?       |         |         |         | 122 |
| Bay Of Islands Holiday Park                      | Lilypond Puketona Rd             | 402 7646 | Paihia       | 2603500 | 6656190 | 174.019 | -35.290 | 123 |
| Baylys Beach Holiday Park                        | 22 Seaview Rd Baylys Bea.        | 439 6349 | Dargaville   | 2577885 | 6583125 | 173.746 | -35.951 | 124 |
| Beachside Holiday Park                           | 1290 State Highway 11            | 402 7678 | Paihia       | 2610920 | 6654880 | 174.101 | -35.301 | 125 |
| Blue Heron Holiday Park                          | Scott Rd RD 4                    | 436 2293 | Whangarei    | 2639055 | 6600905 | 174.420 | -35.784 | 126 |
| Camp Waipu Cove                                  | Waipu Cove                       | 432 0410 | Whangarei    | 2646185 | 6573520 | 174.504 | -36.029 | 127 |
| Dargaville Campervan Park                        | 16-18 Gladstone Rd               | 439 8479 | Dargaville   | 2589320 | 6584625 | 173.872 | -35.937 | 128 |
| Dargaville Holiday Park                          | 10 Onslow St Dargaville          | 439 8296 | Dargaville   | 2589320 | 6584625 | 173.872 | -35.937 | 129 |
| Gibby's Place                                    | 331 Kerikeri Rd Kerikeri         | 407 9024 | Kerikeri     | 2597420 | 6663545 | 173.951 | -35.225 | 130 |
| Haruru Falls Resort                              | Haruru Falls                     | 402 7525 | Paihia       | 2606345 | 6657370 | 174.050 | -35.279 | 131 |
| Hih Beach Holiday Camp                           | Hih Rd Mangonui                  | 406 0307 | Mangonui     | 2563130 | 6688520 | 173.572 | -35.003 | 132 |
| Houhora Heads Motor Camp                         | Houhora Hds Rd RD 4              | 409 8564 | Kaitaia      | 6707050 | 6707050 | 173.135 | -34.838 | 133 |
| Kamo Springs Holiday Park                        | 1 State Hwy, North of Kamo       | 435 1208 | Whangarei    | 2627725 | 6612325 | 174.293 | -35.682 | 134 |
| Kauri Coast Top 10 Holiday Park                  | Trounson Park Rd Kaiti           | 439 0621 | Dargaville   | 2572925 | 6603625 | 173.689 | -35.767 | 135 |
| Kerikeri Top 10 Holiday Park                     | Kerikeri Rd Kerikeri             | 407 9326 | Kerikeri     | 2597420 | 6663545 | 173.951 | -35.225 | 136 |
| Matakohe Holiday Park                            | Church Rd Matakohe               | 431 6431 | Maungaturoto | 2617175 | 6562875 | 174.184 | -36.129 | 137 |
| Matauri Bay Holiday Park Ltd                     | Matauri Bay Rd                   | 405 0525 | Kaero        | 2593025 | 6683650 | 173.900 | -35.044 | 138 |

|                                |             |              |         |         |         |         |     |
|--------------------------------|-------------|--------------|---------|---------|---------|---------|-----|
| Oakura Motels & Holiday Park   | 433 6803    | Whangarei    | 2632810 | 6644705 | 174.343 | -35.390 | 139 |
| Opononi Beach Holiday Park     | 405 8791    | Kaikohe      | 2546400 | 6632750 | 173.393 | -35.506 | 140 |
| Orongo Bay Holiday Park        | 403 7704    | Russell      | 2615210 | 6657025 | 174.148 | -35.281 | 141 |
| Otaika Motel & Holiday Park    | 438 1459    | Whangarei    | 2619900 | 6604350 | 174.208 | -35.755 | 142 |
| Pagoda Lodge                   | 407 8617    | Kerikeri     | 2599050 | 6663295 | 173.969 | -35.227 | 143 |
| Pahi Beach Motor Camp          | 431 7322    | Maungaturoto | 2621075 | 6565375 | 174.227 | -36.106 | 144 |
| Paparoa Motor Camp             | 431 6515    | Paparoa      | 2621005 | 6560055 | 174.227 | -36.154 | 145 |
| Pukenui Holiday Park           | 409 8803    | Kaitaia      | 2523300 | 6707050 | 173.135 | -34.838 | 146 |
| Rawene Motor Camp              | 405 7720    | Rawene       | 2556365 | 6644230 | 173.502 | -35.402 | 147 |
| Ruakaka Reserve Motor Camp     | 432 7590    | Whangarei    | 2641935 | 6587400 | 174.455 | -35.905 | 148 |
| Russell Top 10 Holiday Park    | 403 7826    | Russell      | 2613980 | 6659425 | 174.134 | -35.260 | 149 |
| Taupo Bay Camping Ground Ltd   | 406 0315    | Mangonui     | 2575575 | 6689550 | 173.709 | -34.992 | 150 |
| Tokerau Beach Motor Camp       | 408 7150    | Kaitaia      | 2544500 | 6701025 | 173.367 | -34.891 | 151 |
| Treasure Island Trailer Park   | 436 2390    | Whangarei    | 2648125 | 6607675 | 174.519 | -35.721 | 152 |
| Tutukaka Holiday Park          | 434 3938    | Whangarei    | 2648765 | 6620415 | 174.524 | -35.606 | 153 |
| Twin Pines Tourist Park        | 402 7322    | Paihia       | 2610475 | 6656375 | 174.096 | -35.288 | 154 |
| Wagener Holiday Park           | 409 8564    | Kaitaia      | 2523300 | 6707050 | 173.135 | -34.838 | 155 |
| Wagon Train R.V. Park          | 407 7889    | Kerikeri     | 2595640 | 6660360 | 173.932 | -35.254 | 156 |
| Waitangi Motor Camp            | 402 7866    | Paihia       | 2609010 | 6657770 | 174.079 | -35.275 | 157 |
| Whananaki North Motel          | 433 8896    | Whangarei    | 2643830 | 6631390 | 174.467 | -35.508 | 158 |
| Whangarei Falls Holiday Park   | 437 0609    | Whangarei    | 2633340 | 6613835 | 174.355 | -35.668 | 159 |
| Whangarei Top 10 Holiday Park  | 0800 455488 | Whangarei    | 2629425 | 6609175 | 174.312 | -35.711 | 160 |
| Whangaroa Harbour Holiday Park | 405 0306    | Kaero        | 2578725 | 6681670 | 173.744 | -35.063 | 161 |
| Whangaruru Beachfront Camp     | 433 6806    | Hikurangi    | 2631215 | 6649150 | 174.325 | -35.350 | 162 |
| Whatuwhiwi Holiday Park        | 408 7202    | Kaitaia      | 2548350 | 6702425 | 173.409 | -34.878 | 163 |



**Appendix 5. Ranking of sites of ecological value in Northland. Visitor numbers are based on a relative grade of H = high, M = medium, L = low. Grid references of sites (NZMG and latitude/longitude, WGS84 datum - in decimal degrees) were obtained using Topomap® software.**

| Ranking                | Site                                  | Habitat        | Visitors | NZMG East | NZMG North | Longitude | Latitude |
|------------------------|---------------------------------------|----------------|----------|-----------|------------|-----------|----------|
| <b>High priority</b>   |                                       |                |          |           |            |           |          |
| 1                      | Pouito Peninsula                      | Wetland        | H        | 2615900   | 6537175    | 174.174   | -36.361  |
| 2                      | Te Pahi/North Cape                    | Sand/Forest    | H        | 2492800   | 6744325    | 172.801   | -34.503  |
| 3                      | Ngunguru Sandspit/Whakariora          | Sand           | M        | 2647350   | 6617075    | 174.509   | -35.637  |
| 4                      | Ahipara Massif                        | Gumlands       | M        | 2522200   | 6668675    | 173.125   | -35.184  |
| 5                      | Kaimaumau/Motutangi Wetlands          | Wetland        | M        | 2510000   | 6715000    | 172.990   | -34.767  |
| 6                      | Kokota Sandspit                       | Sand           | L        | 2509000   | 6739500    | 172.978   | -34.546  |
| 7                      | Manganui River                        | Wetland        | L        | 2608425   | 6584600    | 174.084   | -35.935  |
| 8                      | Maitahi Wetland                       | Wetland        | L        | 2578300   | 6592600    | 173.749   | -35.866  |
| 9                      | Waipoua/Mataraua/Waima Forest complex | Forest         | H        | 2564450   | 6626600    | 173.593   | -35.561  |
| 10                     | Bream Head                            | Forest         | H        | 2654225   | 6592850    | 174.590   | -35.854  |
| 11                     | Puketi/Omahuta Forest                 | Forest         | H        | 2569225   | 6662400    | 173.642   | -35.238  |
| 12                     | Utakura/Pukewharariki Forest          | Forest         | L        | 2575450   | 6645750    | 173.712   | -35.387  |
| <b>Medium priority</b> |                                       |                |          |           |            |           |          |
| 13                     | Ngawha Geothermal Field               | Geothermal     | H        | 2589500   | 6642800    | 173.867   | -35.412  |
| 14                     | Waipu sandspit                        | Sand           | H        | 2645050   | 6575800    | 174.491   | -36.009  |
| 15                     | Mangawhai Sandspit                    | Sand           | H        | 2654585   | 6566290    | 174.599   | -36.093  |
| 16                     | Hikurangi Swamp                       | Wetland        | H        | 2624680   | 6623505    | 174.257   | -35.582  |
| 17                     | Mimiwhangata                          | Wetland/Forest | H        | 2638450   | 6638550    | 174.407   | -35.444  |
| 18                     | Lake Ohia                             | Wetland        | M        | 2543995   | 6692450    | 173.363   | -34.969  |
| 19                     | Maunganui Bluff                       | Forest         | H        | 2561400   | 6604800    | 173.561   | -35.757  |
| 20                     | Trounson Forest                       | Forest         | H        | 2569465   | 6608725    | 173.650   | -35.721  |
| 21                     | Cape Brett                            | Forest         | H        | 2625600   | 6662350    | 174.261   | -35.232  |
| 22                     | Whangaruru                            | Forest         | H        | 2634505   | 6647945    | 174.361   | -35.360  |
| 23                     | Mt Manaia Forest                      | Forest         | H        | 2647575   | 6596550    | 174.515   | -35.822  |
| 24                     | Waipu Gorge Forest                    | Forest         | H        | 2635590   | 6570730    | 174.387   | -36.056  |
| 25                     | Brynderwyn Forest                     | Forest         | H        | 2638915   | 6568810    | 174.425   | -36.073  |
| 26                     | Herekino Forest                       | Forest         | M        | 2533500   | 6667000    | 173.249   | -35.199  |
| 27                     | Warawara Forest                       | Forest         | M        | 2539000   | 6647000    | 173.311   | -35.378  |
| 28                     | Raetea/Maungataniwha Forest           | Forest         | M        | 2551500   | 6667500    | 173.447   | -35.193  |
| 29                     | Marlborough Forest                    | Forest         | M        | 2576000   | 6613000    | 173.722   | -35.682  |
| 30                     | Kaihu Forest                          | Forest         | M        | 2574575   | 6604175    | 173.707   | -35.762  |

|   |                               |         |   |         |         |         |         |
|---|-------------------------------|---------|---|---------|---------|---------|---------|
| 31  | Maungatapere Mountain         | Forest  | M | 2618205 | 6601865 | 174,189 | -35,778 |
| 32  | Mareteu Forest                | Forest  | M | 2633230 | 6578105 | 174,360 | -35,990 |
| 33  | Puketotara Peninsula remnants | Forest  | L | 2627525 | 6547075 | 174,302 | -36,270 |
| <b>Low priority</b>                       |                               |         |   |         |         |         |         |
| 34  | Otokairangi                   | Wetland | L | 2617050 | 6620775 | 174,174 | -35,608 |
| 35  | Maitai Bay Remnants           | Forest  | H | 2548475 | 6706100 | 173,411 | -34,845 |
| 36  | Tangihua Forest               | Forest  | H | 2610175 | 6595800 | 174,102 | -35,834 |
| 37  | Pukenui Forest                | Forest  | H | 2627765 | 6607000 | 174,294 | -35,730 |
| 38  | Berghan Point/Whakaangi       | Forest  | M | 2561500 | 6694500 | 173,554 | -34,949 |
| 39  | Mangonui Forest               | Forest  | M | 2575000 | 6687000 | 173,703 | -35,015 |
| 40  | Motatau                       | Forest  | M | 2607500 | 6623000 | 174,068 | -35,589 |
| 41  | Mangakahia Forest             | Forest  | M | 2597300 | 6614125 | 173,957 | -35,670 |
| 42  | Russell Forest                | Forest  | M | 2622725 | 6648700 | 174,232 | -35,355 |
| 43  | Pukekaroro Forest             | Forest  | M | 2640325 | 6562250 | 174,442 | -36,132 |
| 44  | Berghan's Bush                | Forest  | M | 2598000 | 6572700 | 173,970 | -36,043 |
| 45  | Bream Tail                    | Forest  | M | 2653590 | 6571540 | 174,587 | -36,046 |
| <b>High priority - Offshore Islands</b>   |                               |         |   |         |         |         |         |
|   | Motuopao Island               |         |   | 2477800 | 6748000 | 172,638 | -34,470 |
|   | Matapia Island                |         |   | 2492500 | 6732900 | 172,798 | -34,606 |
|   | Simmonds Islands              |         |   | 2525200 | 6716200 | 173,156 | -34,755 |
|   | Cavalli Islands Group         |         |   | 2596700 | 6688400 | 173,940 | -35,001 |
|   | Motukokako Island             |         |   | 2632800 | 6669675 | 174,339 | -35,165 |
|   | Bream Islands                 |         |   | 2654550 | 6594400 | 174,593 | -35,840 |
|   | Poor Knights Islands          |         |   | 2667500 | 6635600 | 174,727 | -35,466 |
|   | Hen and Chickens Islands      |         |   | 2665500 | 6580100 | 174,717 | -35,967 |
|   | Three Kings Islands           |         |   | 2432300 | 6781100 | 172,145 | -34,170 |
| <b>Medium priority - Offshore Islands</b> |                               |         |   |         |         |         |         |
|   | Stephenson Island             |         |   | 2582400 | 6692800 | 173,783 | -34,963 |
|   | Motuaroia Island              |         |   | 2616775 | 6662400 | 174,164 | -35,233 |
|   | Moturu Island                 |         |   | 2619200 | 6663500 | 174,191 | -35,222 |
|   | Motukiekie Island             |         |   | 2620350 | 6664150 | 174,203 | -35,216 |
|   | Okahu Island                  |         |   | 2620925 | 6666150 | 174,209 | -35,198 |
|   | Waewaetorea Island            |         |   | 2621375 | 6665625 | 174,214 | -35,203 |
|   | Urupukapuka Island            |         |   | 2623200 | 6664250 | 174,234 | -35,215 |

## Appendix 6. Records of Argentine ants in Northland (Landcare Research database 2006).

| Site                                 | Year detected | NZMG Map | NZMG East | NZMG North |
|--------------------------------------|---------------|----------|-----------|------------|
| 114 Reotahi Rd, Whangarei Heads      | 2001          | Q07      | 26460     | 65966      |
| 52 Sherwood Rd., Whangarei           | 2001          |          |           |            |
| Ahipara Beach, Northland             | 2002          | N04      | 25250     | 66710      |
| Awakino Rd., Dargaville              | 2001          | P07      | 25897     | 65850      |
| Bank St outside building, Whangarei  | 2001          | Q07      | 26303     | 66084      |
| Bay View Rd, Paihia                  | 2002          | P05      | 26101     | 66570      |
| Bayleys Beach, Bayleys Beach         | 2000          | P07      | 25776     | 65834      |
| Brooker Bay, Whananaki North         | 2002          | Q06      | 26424     | 66349      |
| Dent St., Whangarei                  | 2001          | Q07      | 26302     | 66078      |
| DOC field centre, Whangarei          | 2001          | Q07      | 26301     | 66067      |
| Dutch Point Rd, Norfolk Ave, Reotahi | 2001          | Q07      | 26475     | 65966      |
| end of Seacrest Rd, Langs Beach      | 2002          |          | 26495     | 65711      |
| Fraser St, Port, Whangarei           | 2000          | Q07      | 26324     | 66058      |
| George Point Rd, Whangarei           | 2002          |          | 26332     | 66049      |
| Goodwin St., Whangarei               | 2001          |          |           |            |
| Gordon St, Dargaville                | 2001          | P07      | 25897     | 65850      |
| Grey St East, Mangonui               | 2002          | Q05      | 25592     | 66905      |
| Handforth St., Whangarei             | 2001          |          |           |            |
| Hatea Drive, Whangarei               | 2002          |          |           |            |
| Hewlet St., Whangarei                | 2001          | Q07      | 26323     | 66057      |
| Hewlett St, Whangarei Port           | 2000          | Q07      | 26324     | 66056      |
| Hillcrest Rd, Kaikohe                | 2002          | P05      | 25821     | 66436      |
| Islington St, Dargaville             | 2001          | P07      | 25897     | 65850      |
| Jacaranda Place, Kerikeri            | 2002          | P05      | 25973     | 66634      |
| Kaitaia                              | 2001          | O04      | 25346     | 66766      |
| Kauika Rd West, Whangarei,           | 2002          |          | 26290     | 66077      |
| Kerikeri                             | 2000          | P05      | 25938     | 66674      |
| Langs Beach, Langs Beach             | 2001          | Q08      | 26491     | 65715      |
| Long Bay (Long Beach?), Russell      | 2002          | Q05      | 26137     | 66596      |
| Mangawhai Heads, Mangawhai           | 2002          | R08      | 26532     | 65670      |
| Mangonui                             | 2000          | O04      | 25592     | 66905      |
| Marsden Point oil refinery,          | 2002          | Q07      | 26456     | 65944      |
| Matauhi Road, Russell                | 2002          | Q05      | 26136     | 66586      |
| Maungatapere, Whangarei              | 2004          | Q07      |           |            |
| Maungaturoto - Bickerstaff Rd        | 2002          | Q08      | 26335     | 65641      |
| McLeods Bay, McLeods Bay             | 2002          | S11      | 26998     | 64821      |
| Mill Bay, Mangonui                   | 2002          | Q05      | 25590     | 66901      |
| Ngunguru, Northland                  | 2002          | Q06      | 26468     | 66177      |
| Onerahi, in house, Whangarei         | 2001          | Q07      | 26341     | 66039      |
| Onerahi, Whangarei                   | 2002          | Q07      | 26336     | 66029      |
| outside Astral Marine, Whangarei     | 2000          | Q07      | 26318     | 66058      |
| Paroa Bay, Russell                   | 2002          | Q05      | 26171     | 66575      |
| Parore St, Dargaville                | 2001          | P07      | 25897     | 65850      |
| Plunket/Ranfurlly St, Dargaville     | 2001          | P07      | 25897     | 65850      |
| Port Rd, Whangarei                   | 2001          | Q07      | 26318     | 66058      |
| Puckey Ave, Pak 'n' Sav, Kaitaia     | 2001          | O04      | 25346     | 66766      |
| Reyburn House, Whangarei             | 2000          | Q07      | 26306     | 66077      |
| Rimu St, Dargaville                  | 2001          | P07      | 25897     | 65850      |
| Riverside Drive, Whangarei           | 2001          |          |           |            |
| Rockells Bay, Whananaki              | 2002          | Q06      | 26422     | 66352      |
| Ruakaka, beach and dunes             | 2002          | Q07      | 26416     | 65867      |
| Russell Heights Road, Russell        | 2002          | Q05      | 26126     | 66597      |
| Russell, 46 Oneroa Rd, Russell       | 2002          | Q05      | 26132     | 66590      |
| SH1 Awanui, Kaitaia                  | 2002          | O04      | 25343     | 66837      |
| Station Rd., Whangarei               | 2001          |          |           |            |

|                             |      |     |       |       |
|-----------------------------|------|-----|-------|-------|
| The Heights Rd, Reotahi Bay | 2002 | Q07 | 26461 | 65964 |
| Tirarau St, Dargaville      | 2001 | P07 | 25897 | 65850 |
| Tokerau Beach               | 2004 | O03 | 25449 | 67022 |
| Tutukaka                    | 2002 | Q06 | 26488 | 66201 |
| Urquharts Bay               | 2002 | Q07 | 26493 | 65937 |
| Victoria St, Dargaville     | 2001 | P07 | 25897 | 65850 |
| Waipu township, Waipu       | 2002 | Q08 | 26413 | 65785 |
| Whananaki, Northland        | 2001 | Q06 | 26436 | 66314 |
| Whangaparaoa, Whangaparaoa  | 2001 | R10 | 26665 | 65058 |
| Worth St, Kaitaia           | 2002 | O04 | 25346 | 66766 |

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