

## Case Study 5

# Response to the Incursion of the Red Imported Fire Ant



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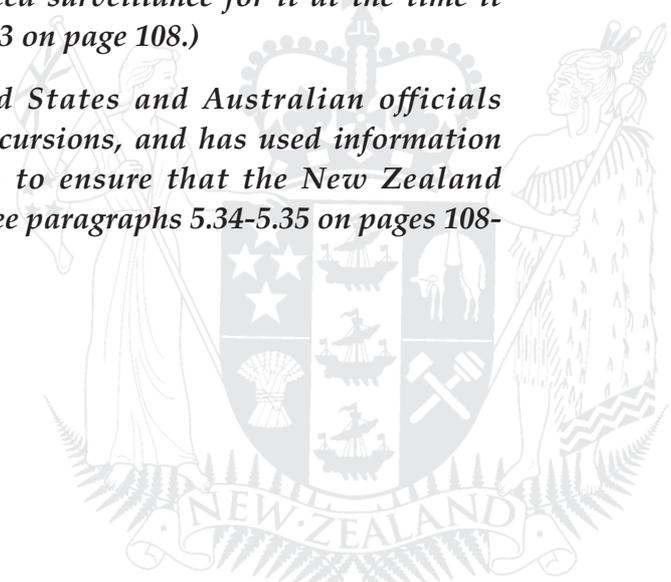
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### Why Did We Select This Case Study?

- 5.1 The Red Imported Fire Ant (the fire ant) was detected at Auckland International Airport in February 2001, at which time the proposal for this audit was being prepared. This incursion was therefore selected as a case study as it gave us the opportunity to examine MAF's response to the pest while it was under way. A week before the fire ant was detected in Auckland it was detected in Brisbane, and we were therefore able to examine MAF's response compared to that mounted by the authorities in Australia.
- 5.2 This case study enabled us to examine the work of the Animals Biosecurity Group within MAF Biosecurity.

### Key Findings

- 5.3 *MAF has managed the response to the fire ant well. The initial treatment of and surveillance around the nest was effective. People with relevant expertise and experience were identified quickly and have been involved throughout the response. (See paragraphs 5.14-5.22 on pages 101-102.)*
- 5.4 *Looking for further fire ants required careful, painstaking surveys in an extensive area around the nest site. The surveys were thorough but hampered by debris on some of the areas being searched. Targeted surveillance is continuing and no further fire ants have been found. (See paragraphs 5.23-5.31 on pages 103-108.)*
- 5.5 *The fire ant is widely acknowledged as one of the worst pests of its kind in the world, but there was no targeted surveillance for it at the time it was detected. (See paragraphs 5.32-5.33 on page 108.)*
- 5.6 *MAF has worked well with United States and Australian officials involved in responding to fire ant incursions, and has used information and experience from these officials to ensure that the New Zealand response is as effective as possible. (See paragraphs 5.34-5.35 on pages 108-109.)*





## CASE STUDY 5 – RESPONSE TO THE INCURSION OF THE RED IMPORTED FIRE ANT

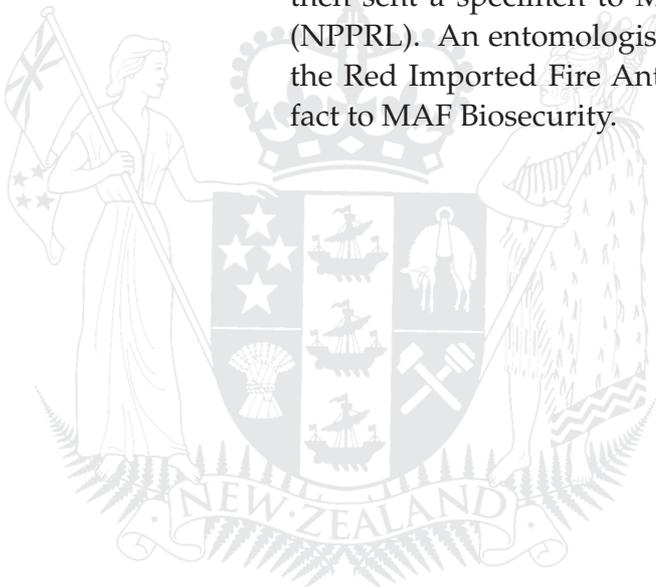
- 5.7 *Analysis of the risk of re-introduction of the fire ant into New Zealand was slow to be started. While the analysis was under way, the focus was to determine the extent of the infestation, and to raise awareness among those most likely to detect the ant, rather than to impose any additional inspection measures. (See paragraphs 5.40-5.46 on pages 110-111.)*

### Recommendations

- 5.8 *MAF's project to develop a list of high-risk invasive species to be subject to priority surveillance is an important initiative. We agree with MAF that it should be accorded high priority. (See paragraphs 5.32-5.33 on page 108.)*
- 5.9 *MAF should expedite the completion of Pest Risk Assessments or Release Assessments prepared as a result of finding unwanted pests, so that additional inspection measures can be prepared as soon as practicable. (See paragraph 5.46 on page 111.)*

### Introduction

- 5.10 On Thursday, 1 March 2001, an *Interim Post Border Interception Report* stating that a fire ant nest had been found at Auckland International Airport was received by the Programme Co-ordinator, Exotic Animal Response Team in MAF Biosecurity.
- 5.11 The fire ants were discovered when a groundsman was stung several times after he had disturbed a nest while mowing the lawn during the week of 12-18 February. The groundsman reported the presence of the ants to MAF Quarantine Service staff at the airport on 28 February, who then sent a specimen to MAF's National Plant Pest Reference Laboratory (NPPRL). An entomologist at the NPPRL identified the specimen as being the Red Imported Fire Ant (*Solenopsis invicta*) and sent notification of this fact to MAF Biosecurity.



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- 5.12 Analysis of the nest indicated that it had been there for a period of between nine months and two years. MAF suspects that the fire ant nest discovered at Auckland International Airport was most likely to have been initiated by a single queen ant imported on commercial cargo.
- 5.13 Red Imported Fire Ants were detected in Brisbane one week before the nest was discovered in Auckland (see Figure 5.1 below).

*Figure 5.1  
The Fire Ant Incursion in Queensland*

The red imported fire ant was detected in Brisbane on 22 February 2001. Two main areas of infestation were identified – at the mouth of the Brisbane River and in the south-west suburbs of the city. It was subsequently found to have spread throughout the Brisbane area.

Scientists estimate that the fire ant had been present in Brisbane for about five years before detection.

At the time the fire ant was detected in Brisbane, it was on the Queensland Department of Primary Industries' pest list but no active surveillance for the ant was under way. As happened in New Zealand, the fire ant was not detected by a formal surveillance programme but was reported to officials by individuals who had been bitten and stung by the fire ants. This demonstrates the important role played by the general public in detecting unwanted pests.



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Figure 5.2  
The Red Imported Fire Ant

The red imported fire ant is recognised as one of the most serious pests in the world. It poses a significant threat to biodiversity, human health, and the horticultural and agricultural industries.

The fire ants are active and aggressive and will attack anything that disturbs their nest. They are named after the painful burning sensation, similar to a bee or wasp sting, that is left by their venom. They damage crops by feeding directly on them, and the mounds they build interfere with farming and can turn recreational spaces into no-go areas.



The fire ants are native to South America and have spread throughout the southern part of the United States. Once established, fire ants are very difficult to control. They are associated with huge economic costs, and costs in terms of human health and native biodiversity. The total annual financial cost of the fire ant to the US has been estimated at US\$1,200 million. The annual costs associated with the fire ant in the State of Texas alone have been estimated at US\$581 million.

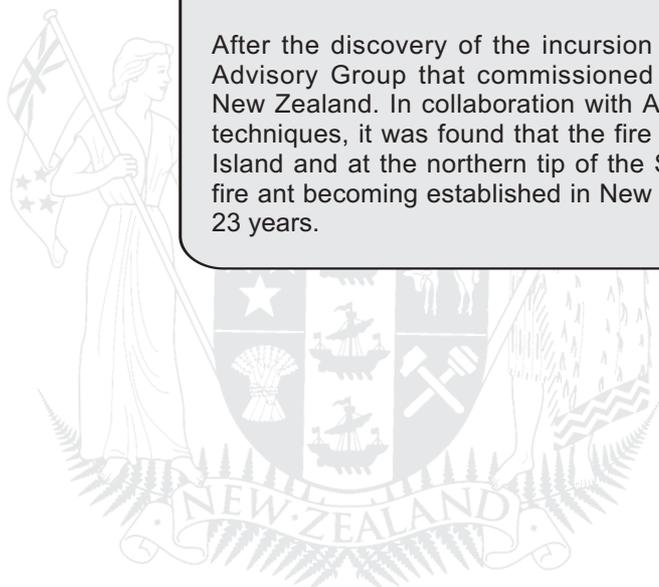
### Potential Impact of the Red Imported Fire Ant in New Zealand

One American survey reported that 89% of people living in fire ant infested areas said they, or someone in their family, had been stung by a fire ant. (Source: [www.dpi.qld.gov.au](http://www.dpi.qld.gov.au)). Stings from these fire ants have caused the death of 10 people in the US over the last 10 years.



In respect of the Brisbane incursion (see figure 5.1), the Queensland Department of Primary Industries is co-ordinating a major response to the fire ant that will involve baiting (*baiting is the repeated application of fire ant insecticide bait products*) every property in each infested area three to four times a year for the next three years. The Australian Commonwealth and state Governments are funding the response and have committed A\$144 million over the next five years.

After the discovery of the incursion at Auckland airport, MAF established a Technical Advisory Group that commissioned work to determine if the fire ant could survive in New Zealand. In collaboration with Australian scientists using detailed climate modelling techniques, it was found that the fire ant could be established in large areas of the North Island and at the northern tip of the South Island. The potential economic impact of the fire ant becoming established in New Zealand was estimated at \$665 million over the next 23 years.



### How Did MAF Respond to the Fire Ant?

**MAF has managed the response to the fire ant well. The initial treatment of and surveillance around the nest was effective.**

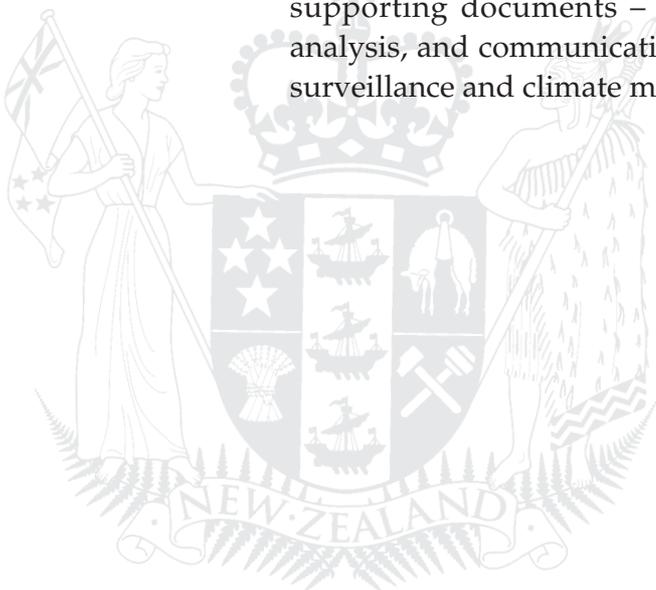
- 5.14 MAF acted quickly to treat the fire ant's nest at Auckland International Airport. NPPRL contracted Flybusters, a pest control company with extensive experience in ant control, to assist with the initial treatment and containment at and around the nest site. This involved destroying the nest by treating it with a chemical called Direct 20P (Diazanone), which took place on 2 March 2001. The area surrounding the nest was treated with chlorpyrifos granules to kill any ants that were foraging or that could have escaped from the nest during the initial treatment.
- 5.15 An intensive survey was made of the 100-metre area surrounding the nest site and no live fire ants were found. Numerous other ant species, known to be established in New Zealand, were found. This was regarded as a good sign because fire ants, once established, are known to displace other invertebrate species, including ants.
- 5.16 On 5 March, two NPPRL entomologists and a Flybusters representative visited the site to ensure that the treatment of the nest had been successful. Another search of the area surrounding the nest was conducted and no live fire ants were found. The three dug up the nest on 8 March and took it back to the NPPRL to be analysed.
- 5.17 The analysis focused on identifying the number of fire ants, and the various life stages present in the nest, in an attempt to establish how long the nest might have been there and whether or not other satellite nests might have been formed. A total of 443 head capsules were extracted and head width measured. These numbers were extrapolated to obtain an estimate of the age of the nest – based on these extrapolated numbers, the United States fire ant experts who have been consulted in the response believe that the nest was at least nine months and up to (but no more than) two years old.
- 5.18 In his report, the groundsman who had been stung stated that he recalled having seen a small mound at the nest site a month earlier. This statement was supported by comments to Flybusters from the airport employee responsible for bird control – that he had noticed the mound in early December 2000 and that it had been regularly mowed over.

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### What Did MAF Do After the Initial Treatment and Site Inspection?

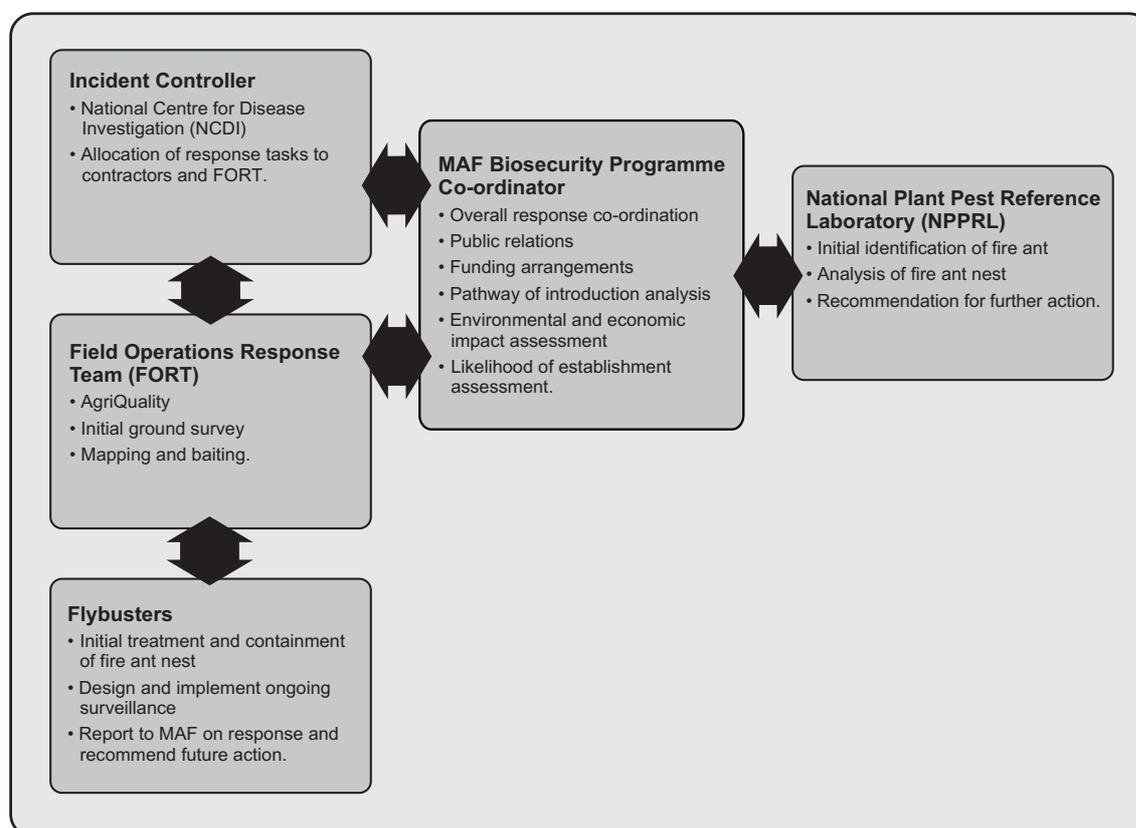
**People with relevant expertise and experience were identified quickly and have been involved throughout the response.**

- 5.19 MAF Biosecurity took lead responsibility for managing the response to the fire ants. It notified the Chief Technical Officers of the Department of Conservation (DOC) and the Ministry of Health (MoH) as soon as the initial report was received, and provided regular updates and opportunities to comment on the action being taken.
- 5.20 MAF Biosecurity quickly convened a Technical Advisory Group (TAG) to discuss the response and further action required. Representatives from MAF Biosecurity, NPPRL, MAF Quarantine Service, the National Centre for Disease Investigation (NCDI), DOC, MoH, the Auckland Regional Council and Flybusters took part in a conference call on 12 March 2001.
- 5.21 Initially, there was some confusion during the conference call over which operational group within MAF would take responsibility for leading the response. In the event it was agreed that an Incident Controller from the NCDI would manage the day-to-day running of the response, and this person worked closely with the MAF Biosecurity Programme Co-ordinator who had overall responsibility for co-ordinating all aspects of the response (See Figure 5.3 on the opposite page).
- 5.22 As well as the TAG, a Policy Development Advisory Group was established to provide non-technical input into preparing an ongoing response to the threat posed by the fire ants. This group focused on preparing a Cabinet paper for funding for the response and other supporting documents – such as an economic impact assessment, risk analysis, and communications plan. This enabled the TAG to focus on the surveillance and climate modelling aspects of the response.



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Figure 5.3  
Red Imported Fire Ant – Roles and Responsibilities



### Surveillance

Looking for further fire ants required careful, painstaking surveys in an extensive area around the nest site. The surveys were thorough but hampered by debris on some of the areas being searched. Targeted surveillance is continuing and no further fire ants have been found.

5.23 After the initial search out to 100 metres around the nest, an intensive survey was conducted in which surveyors stopped every two metres within a radius of 500 metres from the nest. This search included checking the buildings and their roofs where it was safe to do so, lawns and roads in the area, and (as far as it was possible) the container yards. See Figure 5.4 on the next page and Figure 5.5 on page 105.

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Figure 5.4  
Map Showing the Location of the Fire Ant Nest and Nests of Other Ants Detected at Auckland International Airport (23 March 2001)



- 5.24 The fire ant nest was situated on a lawn at the kerb-side of an airfield access road at Auckland International Airport. This road provides access to the area where empty air cargo containers are kept, and also to the area where animals that have been transported by air (such as race horses) are unloaded from their boxes. At the time the nest was found, both of these areas were cluttered with large amounts of rubbish, vegetable matter, packaging and debris (such as rusting skips and corrugated iron). Flybusters raised this issue in a report to MAF that recommended that these areas should be cleared of rubbish as a matter of urgency and thoroughly checked for the fire ant and other pests.

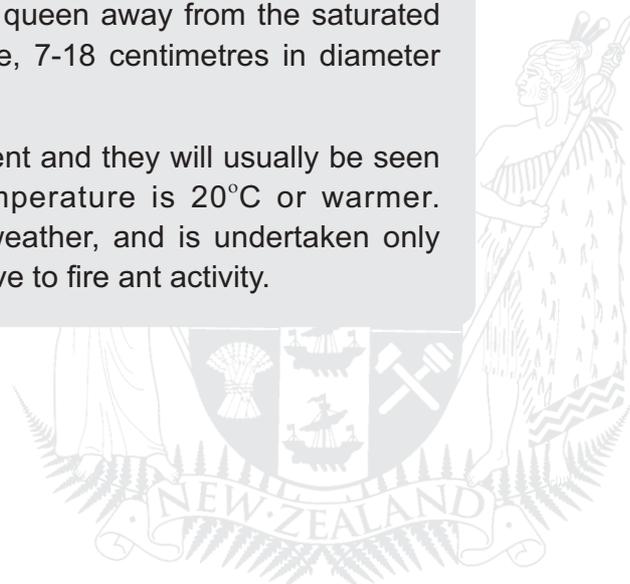
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- 5.25 In relation to biosecurity, these sites are two of the highest-risk at the airport because of their proximity to the road where air freight is transferred to and from aircraft. The risk of a pest falling from a container and becoming established at these sites is high, and those involved in the response consider that this is the likely way in which the fire ant entered New Zealand.
- 5.26 The biosecurity risk is compounded by the fact that the airport buses that transfer passengers between the domestic and international terminals park next to these two yards, thereby providing another potential method by which a pest could be spread further around the airport site and beyond.
- 5.27 MAF Quarantine Services raised this issue with the airport company and requested that these sites be cleared of unsuitable material. Some debris was removed but it was four months before the site was improved. While the debris remained at the site, it presented ideal conditions for other nest sites and prevented the thorough surveillance that was required to be sure that all fire ants had been eradicated from this area.

*Figure 5.5  
Aspects of Fire Ant Surveillance*

Fire ants are active foragers and, once a suitable food item has been located, forage in trails which can be detected without much difficulty. Their nests are more difficult to detect since they burrow underground. These burrows are one of the major economic costs of the fire ants because they can cause subsidence in roads. Potholes caused by fire ants in the US have been up to 1.4 metres long and 15 centimetres deep. After heavy rainfall, the ants build new nests forming mounds as they move the queen away from the saturated soil. Fully developed mounds are, on average, 7-18 centimetres in diameter and 12 centimetres high.

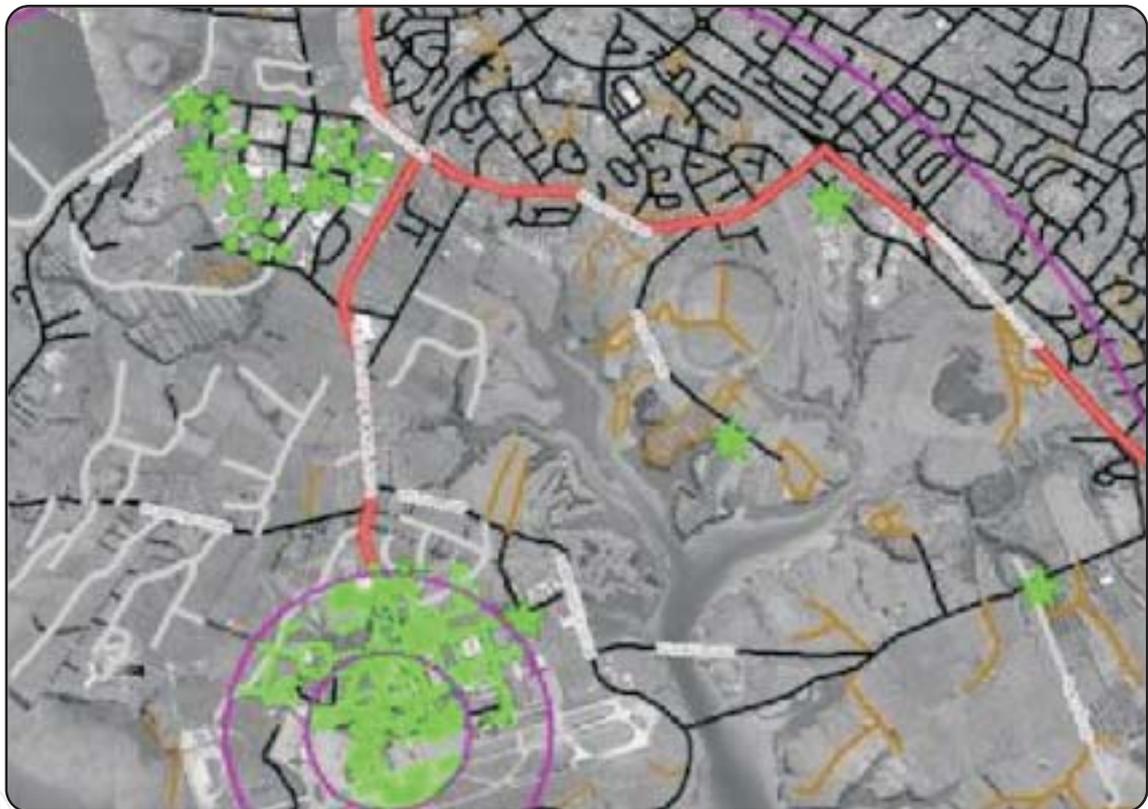
The habits of the fire ant are weather-dependent and they will usually be seen above ground only on days when the temperature is 20°C or warmer. Surveillance is therefore dependent on the weather, and is undertaken only when the temperature reaches a level conducive to fire ant activity.



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- 5.28 Winged ants were reported having been seen in the area of the nest one month prior to the nest being found. This led to the use of a bait monitoring programme<sup>1</sup> of the area within a 1km radius of the nest. This area was mapped and divided into grids of 10m x 10m in which baits were laid. Surveillance of identified high-risk sites within 5km of the nest site was also undertaken (See Figure 5.6 below), and baited traps were laid at all sites.

*Figure 5.6  
Map Showing the High-risk Sites Around the Nest  
Targeted for Surveillance (26 May 2001)*



### Legend

- 500/1000/5000 metres
- Baited Devanning Site
- ★ Baited Nursery
- Baited Cell 10m x 10m

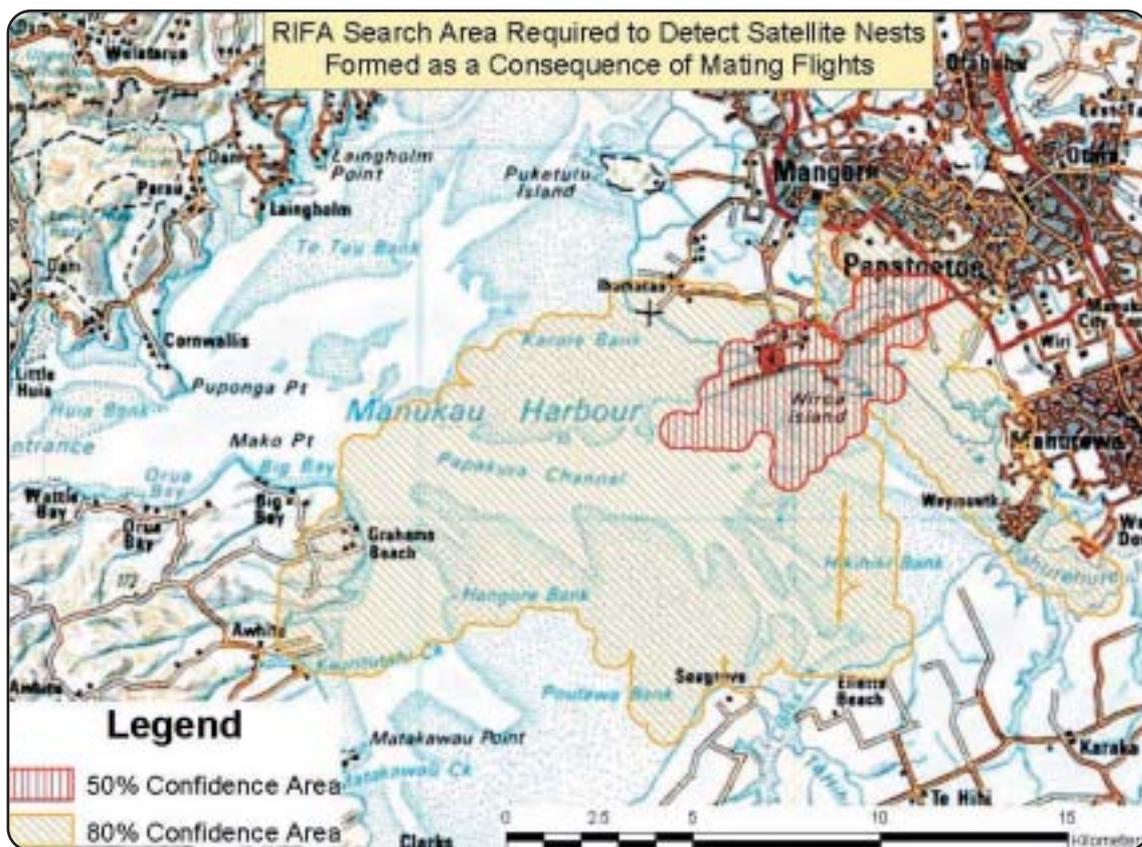
Source: MAF Biosecurity.

<sup>1</sup> Bait monitoring involved setting two bait stations per 100m<sup>2</sup> in this area to detect any other nests in the vicinity. A carbohydrate and protein mixed bait was used.

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- 5.29 Upon hearing that winged adults had been seen in the area, fire ant experts from the US informed MAF that in windy conditions it is possible for a queen fire ant to travel as much as 22km after mating. Based on this advice, National Institute of Water and Atmospheric Research Limited (NIWA) was contracted to produce wind plume models to show the strength and direction of the wind on days when the temperature was high enough for ant mating flights to have occurred. (See Figure 5.7 below.) The information from these models was then used to target areas for further surveillance, and to undertake mail drops to ask householders to keep a lookout for fire ant activity.

Figure 5.7  
Wind Plume Map Produced by NIWA



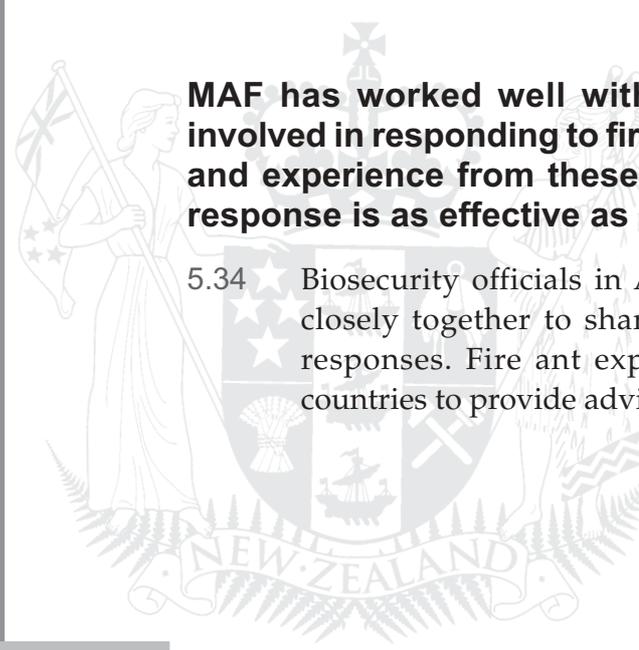


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- 5.30 In December 2001, MAF received special funding of \$1.1 million for a programme of targeted surveillance activities for fire ants. The aim of this surveillance was to confirm that fire ants at the known incursion site (Auckland International Airport) had been eradicated, and to ensure that no colonies have been established at other sites. Targeted surveillance has been undertaken at international ports of entry and surrounding land, sites where containers are unpacked, and at garden centres. The programme has included visual surveillance and the laying of pit fall and baited ground traps.
- 5.31 If the fire ant should be detected as a result of the surveillance, MAF will need to present Cabinet with response options and seek further funding to support these options. As at October 2002, no further fire ants had been found.
- 5.32 At the time the fire ant was detected, there was no targeted surveillance under way for it, despite it being widely acknowledged as one of the worst pests of its kind in the world. The Programme Co-ordinator, Exotic Animal Response in the Animal Biosecurity Group is responsible for co-ordinating the response to the fire ant. A project to identify a list of high-risk, invasive species (such as the fire ant) for which surveillance measures will be undertaken is a priority for the Active Surveillance Co-ordinator who was appointed to Animal Biosecurity in October 2002.
- 5.33 This is an important project that is designed to enhance surveillance measures for particularly high-risk pests, and should be accorded appropriate priority.

### Consultation



**MAF has worked well with United States and Australian officials involved in responding to fire ant incursions, and has used information and experience from these officials to ensure that the New Zealand response is as effective as possible.**

- 5.34 ★ Biosecurity officials in Australia and New Zealand have been working closely together to share information and ideas about their respective responses. Fire ant experts from the United States have visited both countries to provide advice to the response teams.

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5.35 MAF Biosecurity's consultation with United States' fire ant experts has continued throughout the New Zealand response. The experts have provided information and advice, and have reviewed the plans prepared and action taken. Three of these experts visited New Zealand in June 2001 to assess the situation and more closely examine the response. One of the experts, a Professor of Entomology at Texas A&M University and Texas Fire Ant Project Co-ordinator, expressed to us the view that *MAF's response to address the fire ant threat in New Zealand has been superbly managed. He stated that he was very impressed with the measures MAF has taken to survey the area around the detection site and the plans for further surveys.*

### Public Awareness

5.36 A key element in any response involving ongoing surveillance is the need to raise awareness of the pest among the general public and particular groups most likely to come into contact with the pest.

5.37 In March 2001, a fire ant fact sheet was distributed to all of the 50,000 properties within a 5km radius of the nest site. A further 45,000 copies of the fact sheet were distributed in May 2001 to properties in the area identified by the wind plume modelling as being the most likely area to which winged adult fire ants might have flown.

5.38 The fact sheet was produced in consultation with MoH, DOC and the Auckland Regional Council. In addition to being distributed to properties in the areas detailed above, the fact sheet has also been distributed nationally to:

- all Public Health Services, which have in turn communicated in a range of ways to medical practitioners to provide more detailed information on symptoms of fire ant stings, the fire ants, and their mounds;
- veterinarians;
- DOC offices;
- Forest and Bird<sup>2</sup> branches;
- district branches and other affiliates of the SPCA<sup>3</sup>;
- pest control operators, through a national pest control conference recently held in Auckland and an industry-related circular; and
- MAF Quarantine Service (MQS), including every MAF-approved transitional facility.

2 Royal Forest and Bird Protection Society of New Zealand Inc.

3 Royal New Zealand Society for the Prevention of Cruelty to Animals.



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- 5.39 MQS has also undertaken to raise awareness with non-MAF port authority and airport staff working at their respective locations.

### Fire Ant Risk Analysis

**Analysis of the risk of re-introduction of the fire ant into New Zealand was slow to be started. While the analysis was under way, the focus was to determine the extent of the infestation, and to raise awareness among those most likely to detect the ant, rather than to impose any additional inspection measures.**

- 5.40 Two weeks after the fire ant was detected at Auckland International Airport, the TAG advised MAF Biosecurity that all New Zealand international sea and airports should be alerted to the danger of the fire ant. The US expert (paragraph 5.35) also highlighted this issue and stated that *one area of concern that should continue to be addressed is the thorough inspection of cargo, particularly animal crates, from infested ports. With the presence of fire ants in South America, 11 states in the South East of the USA and Australia, the probability of more importations into New Zealand are likely.*
- 5.41 MAF's Programme Co-ordinator also raised this issue with colleagues within MAF in June 2001 and stated that *we need to be extremely careful about checking containers, goods and passengers arriving from infested sites. Incursion through sea containers was identified as one of the most likely risk pathways for the fire ant to enter New Zealand by the US experts.*
- 5.42 The fire ant was detected in February 2001. However, the Risk Analysis Working Group was not established until July 2001 and a draft release assessment<sup>4</sup> was circulated for peer review in January 2002. The assessment was finalised in August 2002, some 18 months after the initial detection.
- 5.43 We asked MAF Biosecurity what, if any, additional inspection measures had been put in place for the fire ant after it had been detected. MAF informed us that it had considered whether to impose any additional inspection measures but had decided not to do so until after a pest release assessment was completed. This, we were told, was because the highest-risk items are already subject to inspections and/or treatment at the border, and because of the inefficiency of cargo inspections for ants.

4 A release assessment considers the likelihood of entry of a pest via a particular pathway up until the point biosecurity clearance is given by MQS. This assessment, taken into account with the likelihood of establishment of the pest in New Zealand and the environmental and economic consequences were it to do so, form the full risk analysis.

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- 5.44 Issues for further consideration identified in the release assessment have now been forwarded to the Chief Technical Officers of the respective groups within MAF Biosecurity and to the Director of the Border Management Group, and are currently under consideration. The issues identified include high-risk pathways for which additional inspection measures might be required.
- 5.45 In addition, a new initiatives bid for a pest risk assessment for invasive ant species and further national surveillance is being prepared.
- 5.46 We note that the time it has taken to complete the release assessment means that some 18 months after the initial detection, no definitive decision has been made on whether additional measures should be introduced. Given the expert advice outlined in paragraph 5.40, we feel that MAF may have been justified in taking a precautionary approach and introducing additional inspection measures for high-risk pathways while the analysis was under way.
- 5.47 MAF's emphasis has been on raising the awareness among people with the greatest opportunity for observing ants as unwanted hitchhikers on imported goods. We consider that the measures to raise awareness are good and have been comprehensive.
- 5.48 MAF should expedite the completion of Pest Risk Assessments or Release Assessments prepared as a result of finding unwanted pests, so that additional inspection measures can be prepared as soon as practicable.



