

Strategies for Managing Incursions of Exotic Animals to New Zealand

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Abstract—A major role of the Animal Biosecurity Group within New Zealand’s Ministry of Agriculture and Forestry Biosecurity Authority (MAF Biosecurity) is to detect and respond to ‘post-border’ incursions of exotic animals. This includes exotic animals that are detected after goods are cleared at New Zealand’s borders, and where the path of entry into New Zealand is not known. The Group develops standards which describe surveillance and response mechanisms, co-ordinates the government response when more than one government agency is involved, and may provide input into the development of pest control programs where exotic animal species have started to establish within New Zealand. Since the creation of MAF Biosecurity in 1999, the Group has initiated responses to exotic snakes, frogs, freshwater fish and numerous invertebrates including scorpions, spiders, wasps and ants. Many of these have come from the tropics. Without careful planning and management there is high potential for some of these species to establish within New Zealand. This paper discusses MAF Biosecurity’s exotic animal response and management systems. The recent incursion of the red imported fire ant (*Solenopsis invicta*) to New Zealand is used as a case study to demonstrate how these standards and procedures work in practice.

Introduction

New Zealand is a small island nation geographically isolated from the rest of the world. It is a country with unique indigenous and relatively primitive biota. Until 1,000 years ago the islands of New Zealand were free of all mammals with the exception of bats and seals. The subsequent intentional and accidental introduction of large numbers of vertebrate and invertebrate animal species has had a devastating effect on New Zealand’s native fauna, particularly on birds, a large number of which are flightless, and invertebrates.

The relatively cool temperatures experienced over much of New Zealand are likely to have prevented the establishment of a large number of exotic species. Nevertheless, many of the animals that are intercepted at the New Zealand border and some of the recently established species have originated from the tropics. With temperatures rising globally the New Zealand climate may become less

prohibitive. With the increase in tourism and trade, the risk of invasion from exotic species is higher than ever. This highlights the need for established and effective surveillance and response systems to facilitate the early detection and management of these invasive species. The New Zealand government has directed the Ministry of Agriculture and Forestry's (MAF) Biosecurity Authority to take the lead and to play a co-ordinating role for these activities in New Zealand. The Animal Biosecurity Group plays a specific role in surveillance and response for exotic animals that are not pests of plants.

Responsibility for Biosecurity in New Zealand

Biosecurity has been described (Biosecurity Council 2000) as "*protection from the risks posed by organisms to the economy, environment and people's health, through exclusion, eradication and control*". In New Zealand there are four government departments with biosecurity operational responsibility – the Ministry of Agriculture and Forestry (MAF), Department of Conservation (DOC), Ministry of Health (MOH) and Ministry of Fisheries (MFish).

These departments report to the Minister for Biosecurity and are co-ordinated through the Biosecurity Council. The Biosecurity Council has an independent chair and includes the chief executives of MAF, DOC, MOH and MFish, the Ministry for the Environment, the Ministry of Maori Development, the Ministry of Research, Science and Technology, and the Environmental Risk Management Agency. A representative of regional councils, the Group Director of MAF Biosecurity, and representatives from the primary production and environment sectors make up the remainder of the Council membership.

The Ministry of Agriculture and Forestry Biosecurity Authority (MAF Biosecurity)

MAF has undergone a number of restructures over the last ten to 15 years. The last major restructure occurred in July 1999 and resulted in the creation of MAF Biosecurity. Currently MAF is comprised of core four businesses, which are overseen by the Director General. These four businesses include MAF Biosecurity, MAF Operations, MAF Policy and the MAF Food Assurance Authority. Each business is separated into a number of sub-businesses, or groups (Fig. 1).

Until July 1999, MAF's main concern was with managing risks to the productive sector -horticulture, agriculture, forestry and (prior to 1995) fisheries. With the creation of MAF Biosecurity the scope of MAF's biosecurity responsibilities have been expanded to incorporate the management of risks to New Zealand's indigenous flora and fauna. This was reflected in the addition of biodiversity to MAF Biosecurity's mission statement: "*To protect New Zealand's unique biodiversity and facilitate exports by managing risks to plant and animal health and animal welfare*". MAF Biosecurity administers the Biosecurity Act 1993 (see below), leads the development of biosecurity policy, develops technical

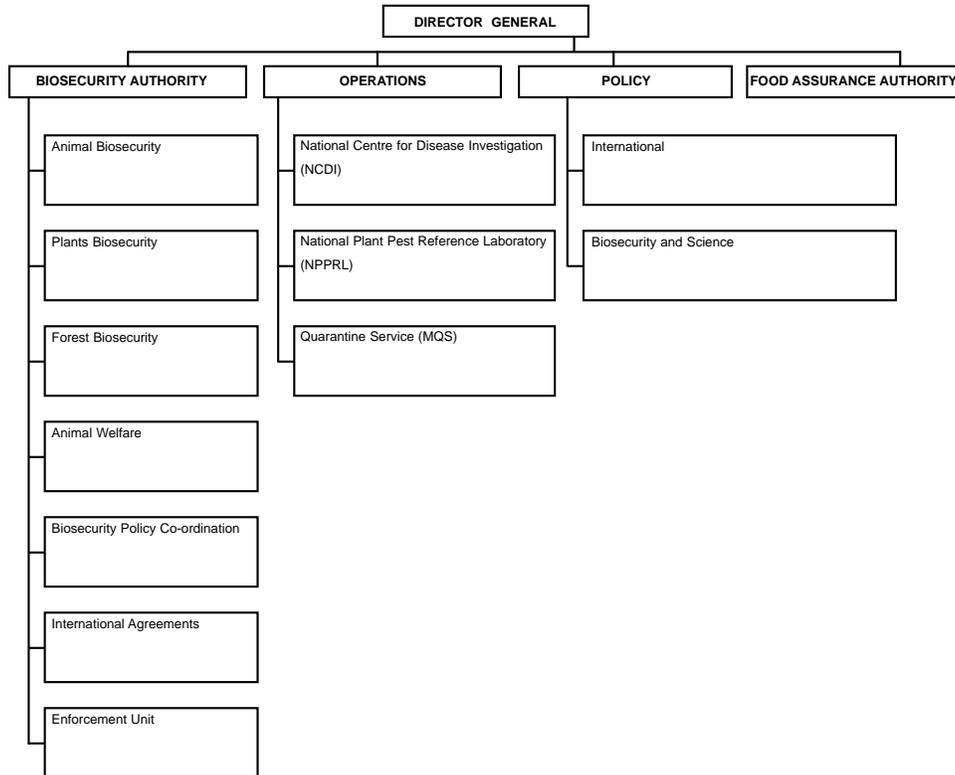


Figure 1. The Four Core MAF Businesses.

standards to translate policy into practice, and co-ordinates the implementation of Government's biosecurity programs.

Legislation, Policies and Memoranda of Understanding (MOU)

The Biosecurity Act 1993 ("the Act") is the principal piece of legislation relating to biosecurity in New Zealand. The Act is not a directive piece of legislation. Instead it provides a range of functions, powers and options for the management of harmful organisms. Whether action occurs largely depends on economic, social and environmental imperatives, as well as technical considerations (Ministry of Agriculture and Forestry 2000).

There are also a number of policies and agreements that impact on the response and management of incursions of exotic animals. Of particular relevance to this paper are the:

- MAF Biosecurity Authority Draft Policy on Responding to an Exotic Animal Incursion (February, 2001): *"The purpose of this policy is to ensure MAF Biosecurity decisions and actions about incursion responses are transparent and consistent. It sets out a generic approach to guide decision making and*

the development of response programmes for specific organisms or groups of organisms”.

- Memorandum of Understanding (MOU) on Biosecurity Matters between MAF Biosecurity, the DOC, MOH and MFish. This MOU is in development and once finalised will clarify the inter-relationship between government agencies with biosecurity responsibilities. It recognises MAF Biosecurity's leadership role in this area.

Biosecurity Controls for the Detection and Management of Exotic Animals

MAF Biosecurity uses a number of methods to prevent and manage incursions of exotic animal species to NZ:

- Pre-border risk management. The main mechanism is import health standards (IHS). IHSs define conditions that must be met in order to import risk goods to New Zealand. These conditions must be met throughout the importation process - in the country of origin, during transit, during importation and during quarantine. IHSs are based on risk analyses.
- Border programs. The Border Management team sets standards for the biosecurity clearance of international passengers, freight and cargo, the co-ordination of measures at transitional facilities (i.e., premises for holding, inspecting, storing or treating risk goods) and border surveillance programs. The Import Management team sets standards for the longer-term quarantine of animals.
- Post-border surveillance and monitoring. MAF Biosecurity oversees a number of active post-border surveillance programs to facilitate the early detection of exotic animals, plants and exotic animal and plant diseases. Some examples of specific surveillance programs currently in place include surveillance for fruit flies, mosquitoes of public health concern and general forest pest species. MAF Biosecurity also provides a toll free Exotic Pest and Disease Emergency Hotline to facilitate the reporting of suspect exotic organisms by the public (a means of passive surveillance).
- Pest management. A pest is an animal (established in New Zealand) that has been identified for management under a Pest Management Strategy (PMS). The majority of PMSs in New Zealand have been developed and are co-ordinated by Regional Councils (i.e., local as distinct from central government) and outline the strategies for managing or eradicating specified pests.
- Post-border response. The following sections discuss these post-border response programs in some detail.

Post-border Responses

Level of Response

How a response to an incursion of an exotic animal is managed depends on the scale or level of response required. This is determined by the type of animal

that is to be managed, its potential for establishment, and the environmental, economic, social and/or cultural impact that it could have on New Zealand. The level of a response could range from simply collecting and providing key organisations and individuals with information about the occurrence and circumstances of the incursion, through to commencing a full-scale containment, management or eradication program. In determining the level of response, consideration must be given to technical feasibility. In the long term the benefits of undertaking a certain action must outweigh the costs.

Response Infrastructure

For large-scale responses, three response centres are set up, all of which have a specific role to play:

1. National Co-ordinating Centre (NCC)

The NCC is based at the MAF Biosecurity Head Office in Wellington. The NCC is responsible for making the final decision on any response action to be taken. The NCC co-ordinates the different players in a response, ensures other affected government agencies and key stakeholder groups are consulted, and manages external communications e.g. media, public, government and non-government agencies, key individuals, industry, other stakeholder groups.

2. Response Centre

The Response Centre reports to the NCC and has operational responsibility for a response. MAF Operations – either the National Plant Pest Reference Laboratory (NPPRL) or the National Centre for Disease Investigation (NCDI) – is responsible for the Response Centre. NPPRL will generally take the lead for incursions of exotic invertebrates. NCDI will generally take the lead for incursions of exotic vertebrates. The Response Centre controls the technical side of a response and makes recommendations for action to the NCC.

3. Field Operations Response Team (FORT)

The FORT reports to the Response Centre. The FORT is set up close to the incursion site and carries out all field activities. Management of the FORT and FORT activities is not necessarily undertaken by MAF. MAF Biosecurity may use external contractors to supply these response services.

Key Elements of a Response

The key elements of any response are:

- Positive identification of the suspect exotic animal
- Identification of the incursion pathway
- Establishing the extent of the spread (delimiting survey)
- Eradication, containment or other management actions
- Consultation
- Communications

As part of the consultation process, a Technical Advisory Group (TAG) may be formed. The TAG provides advice, guidance and technical knowledge to assist MAF Biosecurity with decision making and in the formation of a response plan (or strategy). A TAG will generally include representatives from other affected government departments such as MOH, DOC and/or MFish, local government, specialists with expertise in the biology and control of the species, and other affected or interested parties such as industry representatives and non-government organisations.

Overseas experts are also likely to be consulted, particularly when dealing with species with which New Zealand specialists have little practical experience.

Case Study: The Red Imported Fire Ant (*Solenopsis invicta* Buren Hymenoptera: Formicidae)

The red imported fire ant (RIFA), native to South America, is a tiny, but aggressive, reddish-brown ant with a fierce sting. Outside of South America, RIFA has become a significant environmental, economic and human health pest. In early March 2001, a mature RIFA nest was discovered in a security area at Auckland International Airport in the North Island of New Zealand. The nest was reported by one of the Airport's grounds maintenance staff who was stung by ants after attempting to flatten an unusual looking mound in order to mow the lawn on which it was located. He collected ant specimens and presented them to the MAF Quarantine Service (Figure One) who forwarded them to entomologists at NPPRL. The entomologists identified the ants as RIFA (suspected *invicta*), rang MAF Biosecurity to report the suspected incursion and made recommendations for further action. MAF entomologists visited the site the following morning accompanied by a pest control operator with experience and knowledge in the area of ant control. The nest was located and treated, along with the area within approximately a 60-metre radius of the nest. Other affected government agencies with biosecurity responsibilities – in this instance DOC and MOH – were informed of the find to ensure that they were aware of the situation, of actions taken and to allow them the opportunity to input into the response.

Once the nest had been treated and the entomologists were confident that all the ants had been killed, the nest was excavated for analysis. It became apparent that the nest had been there for some time – at least nine months and up to, but no more than, two years (S. Porter, *pers.comm.*). The disastrous implications of allowing invasive ant species such as *S. invicta* to establish are well documented (Taber 2000). The response was therefore given high priority. The Response Centre was called into action and a FORT was set up. A TAG was also formed. This was to ensure that all available expertise in New Zealand was pooled, and to give other government agencies and key stakeholders the opportunity to input into the response strategy. RIFA experts from the United States were identified and contacted for more details on RIFA biology, control and management. Feedback was also requested on the response to date and advice sought as to how best to

proceed. A media statement was released. An aerial photo of the incursion site was digitised and used to monitor progress of the follow up intensive search and surveillance program.

Initially surveillance focused on the area within a 500m zone of the nest site. No new signs of RIFA were found and surveillance was extended to high-risk sites out to one kilometer. Other high-risk sites beyond the one-kilometer area were also targeted for surveillance e.g. nurseries within a five-kilometre area, and devanning centers - where air containers from the airport are unloaded.

A sub-group of the TAG formed a communications strategy team to ensure that target audiences were defined for an awareness program to increase the likelihood of identifying RIFA through 'passive' surveillance methods. An information sheet was prepared stating what to do and who to contact if suspect RIFA or symptoms of RIFA stings were found. The toll free Pest Emergency Hotline staff were given specific instructions for calls relating to suspected RIFA. A dedicated web site (now at www.maf.govt.nz/fire-ants) was set up as a source of RIFA information and for regular updates on response progress.

The information sheet was distributed to all households within a five-kilometer radius of the nest site (circulation 50,000). Nationally the information sheet was sent to groups thought most likely to either come into contact with or recognise signs of RIFA stings e.g. airports receiving international freight, airport contractors, quarantine offices, transitional facilities, doctors, veterinarians, DOC offices, and pest controllers. A second local mail drop was made based on predicted alate flight paths (circulation 45,000). Alates only fly under certain climatic conditions, so the response centre commissioned an atmospheric research agency to model wind patterns on days conducive to alate flights.

At the time of writing no further signs of this invasive ant species have been found. However, winter conditions and the onset of lower temperatures mean that any young RIFA colonies that may be developing under ground may not be detectable until spring. Monitoring will continue for at least the next two years.

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