Controller and Auditor-General
Tumuaki o te Mana Arotake

Performance audit report

Ministry for Primary Industries: Preparing for and responding to biosecurity incursions

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This is an independent assurance report about a performance audit carried out under section 16 of the Public Audit Act 2001.

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Auditor-General's overview

Biosecurity helps prevent the establishment of pests or diseases that would damage our primary production industries, native flora and fauna, or our health. Our country is more dependent on biosecurity than any other developed country. Biosecurity is fundamental to New Zealand's economic health and natural heritage.

The system to ensure biosecurity is complex. Since 2004, a number of mergers and restructures have changed the responsibilities for managing biosecurity. The new Ministry for Primary Industries (MPI) has provided biosecurity leadership since 30 April 2012.

This year, the theme for my office's work programme is *Our future needs – is the public sector ready?* The focus is on how public entities prioritise work, develop necessary capabilities and skills, and use information to identify and address future needs.

In this context, we carried out a performance audit that looked at how effectively the biosecurity system works in preparing for and responding to the arrival in New Zealand of foreign pests and organisms – biosecurity incursions.

MPI and its predecessor organisations responsible for biosecurity have been, by and large, successful at responding to incursions, dealing with between 30 and 40 incursions a year. They have developed generally high-trust relationships with partners by working together on responses and have improved biosecurity by sharing knowledge and fostering innovative practice.

No border control is 100% effective, so it is important that New Zealand is prepared to deal with incursions effectively. However, it is my view that MPI is under-prepared for potential incursions from some high-risk organisms. Responding to incursions has taken precedence over preparing for the potential arrival of other pests and diseases. Not enough priority has been given to planning. Many response partners who have worked with MPI and its predecessors believe that stronger response capability is also needed.

Improvements are being made, including trying to detect threats earlier by better targeting of surveillance activities, updating existing plans for dealing with specific pests and diseases, and more regular testing to ensure that plans and preparations will work if needed. A new response system has brought more consistency and efficiency to how incursions are dealt with. Some improvements to information systems and how information is used have begun. There is more openness about acknowledging mistakes and treating these as learning opportunities.

However, there is still a lot to do and some serious weaknesses remain. Plans for responding to potential incursions from some high-risk organisms are not yet complete. For example, the plan for dealing with a foot and mouth disease outbreak is inadequate.

Workforce planning and capability development needs to be stronger, so that MPI has the appropriate people, with the right skills, in the right place. Staff are not using the new response system to its full potential, so a better approach is needed to managing staff experience, development, and training. Contracting with partners during responses needs to be more efficient and there is potential for better value for money. Some information systems do not yet link together and information is not used as effectively and efficiently as it could be.

Performance reporting also needs to improve. Stronger outcome-based measures and performance measurement tools are needed to identify how effectively and efficiently incursions are responded to and to ensure continuous improvement.

The recently merged and restructured MPI has an opportunity to achieve lasting improvements in biosecurity preparedness and response. However, the previous track record of delivering sustained improvements is not good. There are many instances where initiatives either have not been completed or have been delivered but not embedded.

There is a desire for improvement, but this requires continued strong leadership from the new management and commitment throughout MPI. I have made some recommendations for improvements to biosecurity preparedness and response that will need to be implemented if MPI is to bring about the changes required.

I thank the staff of MPI and its response partners for their assistance and co-operation in the course of our audit.

Lyn Provost
Controller and Auditor-General

22 February 2013

Our recommendations

Being better prepared

We recommend that the Ministry for Primary Industries:

1. Make all biosecurity planning more realistic by ensuring that plans reflect likely constraints on resources and reflect more accurately the capacity available to deliver them.

2. Complete response plans for high-risk organisms, including foot and mouth disease, and review them at regular intervals to provide assurance that they are fit for purpose.

3. Prepare better for a potential outbreak of foot and mouth disease by:
   - building on Exercise Taurus 2012 and developing and delivering a regular programme of foot and mouth disease testing and simulation;
   - completing an early simulation to test the Animal Health Laboratory's foot and mouth disease readiness, which is a potential bottleneck but remains largely untested;
   - reducing the risk of a breakdown in the enhanced bio-containment laboratory by replacing it at the earliest possible date;
   - creating a plan to undertake carcass disposal across a range of outbreak sizes; and
   - creating a plan of how the vaccine could be used, demonstrating that it is practical to do so, and the potential value for money that would be provided from investing in the vaccine.

4. Improve its:
   - staff capability by preparing a plan to deliver better response experience, training, and induction;
   - workforce planning so that it has the appropriate number of staff, with the required skills; and
   - creation, use, and storage of information by preparing a formal approach to information governance.

Responding better

We recommend that the Ministry for Primary Industries:

5. Make contracting simpler, faster, and more efficient for response partners, and consider the use of a panel contract arrangement for procuring response services from Crown research institutes.

6. Make changes to the Biosecurity Response Services contract and the National Biosecurity Capability Network to reflect its new organisational structure and operating environment.

Ensuring improvement

We recommend that the Ministry for Primary Industries:

7. Prepare a suite of performance measures to:
   - include operational activity, effectiveness and efficiency of response, and individual staff performance;
   - inform continuous improvements to the effectiveness and efficiency of its preparedness and response activities; and
   - report publicly on its effectiveness and efficiency.

Our earlier recommendations

Our 2002 report, *Ministry of Agriculture and Forestry: Management of Biosecurity Risks,* and our 2006 report, *Ministry of Agriculture and Forestry: Managing biosecurity risks associated with high-risk sea containers,* included recommendations about improving how the Ministry works with other public entities to manage biosecurity, more consistent prioritising, and reviewing capability.

Part 1
Introduction

1.1 In this Part, we discuss:

- why biosecurity is important;
- responsibility for biosecurity;
- our audit;
- what we did not cover;
- how we did our audit; and
- the structure of our report.

Why biosecurity is important

1.2 Biosecurity helps prevent the establishment of pests or diseases that would have detrimental effects on our primary production industries, native flora and fauna, and human health. All New Zealanders benefit from a biosecurity system that functions effectively.

1.3 We carried out a performance audit that looked at how effectively the biosecurity system works in preparing for and responding to the arrival and spread in New Zealand of pests and diseases – biosecurity incursions.

1.4 The foreword to the 2003 biosecurity strategy *Tiakina Aotearoa Protect New Zealand* (the 2003 biosecurity strategy) says that "New Zealand is more dependent on biosecurity than any other developed country". It is fundamental to the economic health of the country.

1.5 New Zealand's biosecurity system is underpinned by the Biosecurity Act 1993 and the Hazardous Substances and New Organisms Act 1996 (in relation to new organisms).

1.6 Biosecurity is complex and involves many more entities than just central government agencies. Interested parties are varied and diverse. The Ministry for Primary Industries (the Ministry)[1] provides leadership, but all interested parties – including the public – need to take part and take responsibility, where necessary.

1.7 The first priority is to prevent invasive pests and diseases from entering the country. An attempt is made to do this first by working with other countries to ensure that the pest or disease does not leave the exporting country overseas. There are strict biosecurity procedures at New Zealand airports and ports to prevent incoming goods and passengers from inadvertently introducing pests and diseases. However, no border control is 100% effective and it is sensible to plan for the arrival of pests and diseases.

1 The biosecurity responsibilities of the Ministry for Primary Industries were held by the Ministry of Agriculture and Forestry until 29 April 2012. "the Ministry" as used in this report may refer to either or both of these, depending on the context.

Responsibility for biosecurity

1.8 Since 2004, a number of mergers and restructures have affected biosecurity responsibilities. Figure 1 shows the mergers and restructures.

Figure 1
Timeline of mergers and restructures affecting biosecurity responsibilities 2004–2012

Date	Action
July 2004	Biosecurity New Zealand is established as a business group in Ministry of Agriculture and Forestry (MAF)
July 2007	New Zealand Food Safety Authority (NZFSA) separates from MAF to become a public service department
July 2008	MAF Biosecurity Services and MAF Quarantine Services merge to become MAF Biosecurity New Zealand (MAFBNZ)
July 2010	NZFSA merges back with MAF MAFBNZ ceases to exist as a separate branch within MAF MAFBNZ brand is retained
July 2011	MAF and Ministry of Fisheries merge to create a new ministry covering the primary sector
April 2012	The new ministry becomes Ministry for Primary Industries MAFBNZ brand is retired

Note: Before 2004, biosecurity responsibility rested with several ministries, including MAF.
Source: Ministry for Primary Industries.

Ministry for Primary Industries and management of biosecurity

1.9 On 30 April 2012, the Ministry for Primary Industries (MPI) was created. This is a new organisation formed by merging the previous Ministry of Agriculture and Forestry (MAF), the New Zealand Food Safety Authority (NZFSA), and the Ministry of Fisheries.

1.10 Again, one public entity focuses on increasing export opportunities and improving productivity while protecting New Zealand from biological risks. In 2012/13, the Ministry intends to reduce duplication and costs to save almost $20 million.

1.11 In 2011/12, the Ministry spent $54.6 million in total managing biosecurity risks. Figure 2 shows the Ministry's relevant spending during the last five years on items within the scope of our audit. Between 2007/08 and 2011/12, annual spending (after adjusting for inflation) on:

- laboratories decreased by about 13%;
- surveillance and investigation increased by about 35%;

- core response capability increased by about 13%; and
- preparedness and pest management increased by about 5%.[2]

Figure 2
Ministry for Primary Industry's spending on biosecurity (within the scope of our audit), 2007/08 to 2011/12 (using 2011 Quarter 1 prices)

	Appropriation for financial year ($million)				
Cost area	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2011/12**
Laboratories	4.3	4.2	3.6	3.9	3.7
Surveillance and Investigation	8.0	8.8	8.8	10.4	10.8
Core response capability	5.3	5.2	5.0	6.6	6.0
Cost of responding to incursions	13.0	8.5	2.6	3.3	2.3
Preparedness and Pest Management / National Co-ordination	1.1	1.3	1.6	1.3	1.1
Long-term management of incursions	1.4	2.2	2.8	4.0	2.1
Systems and support	3.9	4.5	3.6	3.5	4.1
Management staff	3.1	6.8	8.9	10.8	2.1
Major projects	0.0	0.9	2.5	5.8	6.2
Totals	**40.1**	**42.3**	**39.5**	**49.7**	**38.5**

Notes: Spending figures have been rounded and may not add up exactly to the totals. We have not audited the spending figures.
For "Management staff" costs, the Ministry reports that, between 2007/08 and 2010/11, this budget category represented the cost of Level 4 managers. From 2011/12, there was a different cost allocation, which is the reason for the apparent reduction rather than major reductions in staff numbers.
Source: Ministry for Primary Industries.

The 2003 biosecurity strategy

1.12 The 2003 biosecurity strategy set out clear expectations of the biosecurity system and took a whole-system view of biosecurity. It also set a clear expectation that a single agency, the Ministry, was accountable for ensuring that biosecurity work met the strategy's intended outcomes.

2 This increase was less than $100,000 and so is too small to appear in Figure 2.

1.13 Introducing the 2003 biosecurity strategy, the Biosecurity Council[3] foresaw that it:

> *... will still be a useful benchmark ten years from now, providing evidence that biosecurity is evolving and delivering the outcomes expected.*

1.14 Nearly ten years on from then, our work shows that some of these expectations have not been fulfilled. The original strategy scheduled an overall review in 2010 to assess long-term progress. This has not been done, which means that there has been no reliable overall assessment of whether the biosecurity strategy's expectations have been met.

Our audit

1.15 This year, the theme of our office's work programme is *Our future needs – is the public sector ready?* The focus is on how public entities prioritise work, develop necessary capabilities and skills, and use information to identify and address future needs.

1.16 In this audit, we looked at what MAF did until 30 April 2012 and what MPI has done since then. We also focused on the opportunities and challenges that MPI faces in maximising its capability and achieving lasting improvements in biosecurity.

AsureQuality

1.17 AsureQuality is a state-owned enterprise. It was formed in 2007 from the merger of ASURE New Zealand Limited and AgriQuality Limited. These companies were formed in 1998 from MAF Quality Management, an arm of the Ministry of Agriculture and Forestry.

1.18 We did not specifically review AsureQuality because it was outside the scope of our audit. However, AsureQuality is one of the Ministry's major contractors and is integral to responding to biosecurity incursions, so we have commented on AsureQuality's service when its effects are within the scope of our audit.

What we did not cover

1.19 New Zealand's biosecurity is more than border protection. The Ministry groups biosecurity work as:

- Offshore – this includes the rest of the world, outside New Zealand's borders, where biosecurity risks emerge and information on intelligence and surveillance is gathered and exchanged.
- Pathways and borders – the ways in which biosecurity-risk goods and

3 In 1997, the Biosecurity Council was established by the then Minister for Biosecurity to advise on biosecurity. The Council comprised chief executives of relevant government departments, and industry and other stakeholder representatives. In 2005, the Council was superseded by the Biosecurity Ministerial Advisory Committee.

organisms arrive and enter New Zealand, the final point at which people, goods, and craft are given approval to enter into or depart from New Zealand.

- Within New Zealand – the management of risks and impacts of pests and diseases that have crossed the border and diseases that have already established in New Zealand.

1.20 We recognise that these three groups are linked. A failure offshore or at the border increases the risk of an incursion. However, we did not examine the offshore or border biosecurity arrangements, such as the adequacy of border controls. Our audit considered biosecurity work within New Zealand only, because this is where most preparedness and response work takes place.

Government Industry Agreement on Biosecurity Readiness and Response

1.21 The Government Industry Agreement on Biosecurity Readiness and Response (GIA) forms an important part of the Ministry's plans to improve biosecurity preparedness and response. Although we consider aspects of the GIA, we did not specifically review it because it will not formally come into effect until 1 July 2013. We provide further details of the GIA in Appendix 1.

How we did our audit

1.22 We interviewed 32 Ministry staff, covering risk assessment, surveillance, laboratory work, preparedness, statistical modelling, information systems, Māori issues, investigation, and responses to incursions.

1.23 We interviewed 54 people from outside the Ministry who were part of the responses in the examples we examined, including the Ministry of Health, Department of Conservation, local government, Crown research institutes (CRIs), AsureQuality, iwi, industry groups, and contractors. We also interviewed a representative of the Biosecurity Ministerial Advisory Committee. We analysed the results of our structured interviews with these response partners and then selected the issues most often mentioned. These are highlighted in Figures 10, 12-14, and 16-18. Although this analysis is not statistically valid, it provides insight into response partners' views of interacting with the Ministry.

1.24 We read and analysed many significant documents with information about the Ministry's preparatory and response work.

1.25 We visited the Ministry's head office in Wellington, the Animal Health Laboratory (AHL) at Wallaceville in Upper Hutt, and the Plant Health and Environment Laboratory at Tamaki in Auckland to learn about what happens during a response.

We observed Exercise Taurus 2012, a foot and mouth disease outbreak simulation that the Ministry held in March 2012.

Examining examples of responses to incursions

1.26 To help us assess the Ministry's performance and effectiveness over time, we reviewed the responses to six incursions in more detail. We looked at examples of how the Ministry has actually responded to pests and diseases.

1.27 The Ministry has between 30 and 40 responses a year, so six is a reasonable sample. Figure 3 describes these six incursions in more detail.

1.28 We chose examples that included:

- primary risks to each of the four values (economic, environmental, human health, and socio-cultural) (see paragraph 4.37 and Figure 15);
- different response environments and types of organisms;
- a selection over time, to observe whether there were improvements in biosecurity practice;
- other agencies and/or response partners taking part;
- significant costs, public profile, or noteworthiness; and
- different stages of response.

Figure 3
Six examples of responses to incursions

Incursion	Detail
Gum leaf skeletoniser	*Uraba lugens* is an Australian moth that damages eucalyptus. The caterpillars have poisonous stinging spines. Found in 2001 in Auckland, where it is now widespread. Could potentially spread through much of the country. The response is notable for using a parasitic wasp, *Cotesia urabae*, to target and control the gum leaf skeletoniser caterpillar.
Didymo	*Didymosphenia geminata* (also known as rock snot or didymo) is a freshwater alga. Didymo sticks to stream, river, and lake beds. It forms a thick brown layer that smothers rocks, submerged plants, and other materials. The response is notable for using human behaviour change as a response tool, provided through social marketing campaigns.
Southern saltmarsh mosquito	*Ochlerotatus camptorhyncus* can carry the debilitating human illness Ross River virus. First detected in 1998 and declared eradicated from New Zealand in July 2010. The response is notable because it is the only recorded eradication of this pest worldwide.
Kauri dieback	*Phytophthora taxon Agathis* (PTA), commonly known as kauri dieback, is a microscopic fungus-like organism that can kill kauri trees. Reported in 2008, PTA is believed to be a soil-borne species spread in a variety of ways, including by humans and animals. The response is notable because it is the first example of a joint biosecurity response between the Ministry, other agencies, and partners. Also the first example of a joint response with iwi.
Psa	*Pseudomonas syringae pv actinidiae* (Psa) is a bacterial canker of kiwifruit. Psa has devastated kiwifruit production in the Bay of Plenty and has spread to other areas. First discovered in 2010. The response is notable because it is the biggest biosecurity response for some years and an example of a joint response with industry.
Juvenile oyster mortality	Ostreid herpes virus-1 kills young oysters. It is not a risk to human health, food safety, or international trade. In late 2010, upper North Island marine farms lost many juvenile oysters. The response is notable because the incursion is due to a combination of factors in the marine environment.

Source: Ministry for Primary Industries.

1.29 During the audit, we also considered two other responses in less detail:

- Queensland fruit fly – *Bactrocera tryoni*, is among the most devastating of more than 4500 members of the Tephritidae family. Queensland fruit fly is known to infest more than 100 species of fruit, including commercial crops such as avocado, citrus, and grape. It is of national significance. In May 2012, a single male Queensland fruit fly was found in Auckland. Intensive checks by the Ministry found no further sign of Queensland fruit fly in New Zealand. The Ministry has confirmed that New Zealand is free of this pest, but that it remains a significant risk.
- Great white cabbage butterfly – *Pieris brassicae*, a pest of brassica crops, was found in Nelson in 2010. This exotic pest looks like the common small white butterfly. Following completion of additional cost-benefit analysis that

included environmental risks, the Department of Conservation has taken over managing and funding the operational arm of this response. The Ministry continues to manage some research work.

Structure of our report

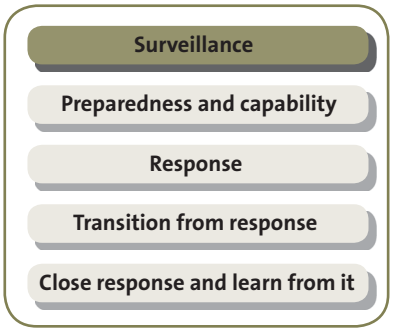
1.30 This report on our performance audit covers the following aspects of biosecurity within New Zealand:

- surveillance – activities that actively or passively try to detect the arrival of new pests and diseases (Part 2);
- preparedness and capability – activities that plan and prepare for dealing with the arrival of pests and diseases, developing and maintaining capability to deal with them, and testing that capability to ensure that it works well (Part 3);
- response – the process from receiving notification of a suspect organism, through investigating it and, if necessary, initiating a response to it (Part 4); and
- transition from, and close down of, response – when response objectives have been met, the activities required to ensure a smooth close down of the Ministry's operations and, where appropriate, the seamless handover to response partners (Parts 5 and 6).

Part 2
Surveillance

2.1 In this Part, we discuss the Ministry's work on surveillance. We set out:

- the Ministry's surveillance programmes;
- the surveillance strategy;
- our views on keeping New Zealanders aware of biosecurity;
- our views about measuring the effect of surveillance; and
- the Ministry's progress with external parties and improving surveillance procurement.



Summary

2.2 The surveillance strategy has not been effectively implemented because it was too ambitious and investment in it has resulted in poor value for money. This has led to response partners' poor perception of the Ministry's ability to deliver. A review in 2002 also identified that the Ministry needed to measure the effectiveness of its surveillance activities, but this has not been achieved.

2.3 Despite a poor strategic approach, the surveillance team has made some progress. It has delivered several discrete and focused pieces of work that are useful and add to the Ministry's capability.[4] A new approach to surveillance procurement is starting to show benefits. Because there are not enough resources available to do all that is required, the Ministry has created a simple way of prioritising surveillance activities, which should help make decision-making more consistent.

2.4 The expectations of the 2003 biosecurity strategy, that the public would be aware of and take part in biosecurity, remain relevant. Public awareness of biosecurity needs constant reinforcing and some work is under way to improve public reporting. However, there is a risk that the benefits of significant investment in previous branding will be lost, reducing public awareness.

The Ministry's surveillance programmes

2.5 Surveillance is an essential part of biosecurity. Protecting New Zealand from pests and diseases depends on effective surveillance. The overall purpose of biosecurity surveillance is:

- detecting pests or diseases early enough to allow for optimal management to occur, including eradication, and to inform choices about other appropriate management strategies;
- providing evidence to support the demonstration of freedom from risk organisms (for example, to facilitate international trade or support pest-free

4 See paragraph 3.50 onwards for our views on capability.

areas within New Zealand);

- helping with the detection and monitoring of new and emerging risks and threats to New Zealand; and
- describing the distribution and prevalence of pests and diseases already present within New Zealand, and the animals and plants they affect, to inform choices about appropriate actions.

2.6 The Ministry's biosecurity surveillance programmes fall into three main groups:

- targeted surveillance – looking for a particular organism. This can include once-only surveys or surveying over several years;
- pathway surveillance – targeting high-risk sites, such as airports and ports, checking for the presence of any new pests or diseases; and
- passive surveillance – receiving information about pests and diseases from the public (using the 0800 biosecurity telephone number, for example), the scientific community, and industry.

2.7 All surveillance must be co-ordinated to ensure that it is planned and carried out in the most effective way.

The surveillance strategy

2.8 In 2005, the Ministry created the Biosecurity Surveillance Strategy 2020 project. This was to fulfil the needs of a 2002 review of biosecurity surveillance systems (the Prime Review)[5] and some of the expectations outlined in the 2003 biosecurity strategy. The objective was to deliver the Biosecurity Surveillance Strategy 2020 (the surveillance strategy) and an implementation plan. The surveillance strategy was endorsed by Cabinet in September 2009. The implementation plan was delivered in draft and needing further work.

The surveillance strategy was too ambitious

2.9 The project to prepare a surveillance strategy was ambitious. It was the first attempt world-wide to write a consistent strategy for developing surveillance programmes covering the marine, animal, plant, and environment sectors. The Ministry resourced the project with staff with limited experience in strategic work. As well as being committed to the surveillance strategy project, these staff also kept their routine workload. The original scoping of the strategy did not properly identify the extent of the consultation required and the complexity of the task.

2.10 Surveillance is heavily dependent on participation from many groups and organisations. Therefore, it was important that improvements focused on the biosecurity system as a whole, not only on activities conducted directly by the

5 Prime Consulting International Limited (2002), *Review of New Zealand's biosecurity surveillance systems*, Waikanae.

Ministry. Preparing the surveillance strategy needed extensive consultation with industry, research and science providers, iwi, and central and regional government.

2.11 The Ministry's report at the end of the project states that the surveillance strategy was delivered nearly two years after the planned completion date of November 2007, which represents a doubling of the original time frame. The total cost for the project was about $160,000 plus 4600 hours of staff time.

2.12 Since 2009, progress on the surveillance strategy's original implementation plan has been poor. Of the 27 workstreams, 20 were supposed to be completed by the second quarter of 2012 and a further four were to have started. By October 2012, only two had finished their work. The Ministry believes that the surveillance strategy is still too ambitious for the resources available, which means that it is unlikely ever to be put into effect as originally planned.

2.13 In our view, the surveillance strategy has failed to achieve its original intentions, was unrealistically ambitious, and paid little attention to the amount of resources likely to be available to implement it. The surveillance strategy, together with the Ministry's 2030 organisational strategy, will now act as a boundary – or vision – within which a more realistic set of surveillance objectives will be prepared.

2.14 The lack of realism in preparing the surveillance strategy means that investing in it has been poor value for money. It also leaves the Ministry in a position where substantial progress is still needed to address the recommendations of the Prime Review and the 2003 biosecurity strategy. The GIA and the increased focus on preparedness will provide opportunities to do some of this, but it is too early to see any results.

2.15 There is a risk that failing to implement the surveillance strategy has damaged the Ministry's reputation among potential surveillance partners (such as local government). Early on in the surveillance strategy project, the Ministry's risk assessment identified that not meeting stakeholders' high expectations of the surveillance strategy was a significant risk to its reputation. Failing to fully put into effect the surveillance strategy is likely to have affected how these stakeholders now view the Ministry.

2.16 Despite the difficult working environment, the surveillance team has made some progress. Since 2009, the surveillance team has carried out several discrete and focused pieces of work that are useful and add to the Ministry's capability. These include:

- the enhanced notification project, which aims to improve notifications through the 0800 telephone number;
- a method for targeting surveillance sites based on risk;

- the biosecurity surveillance atlas; and
- the biosecurity surveillance panel for procurement of services.

Although these projects have value, they are not strategic in scope or scale and are unlikely to significantly help to fulfil the surveillance strategy as intended.

Some progress in prioritising surveillance activity

2.17 There are not enough resources to do all that the Ministry's strategies have required. The Ministry told us that it has created a simple way of prioritising biosecurity surveillance that should make decisions more consistent. Work is under way to better target surveillance activity. The Ministry hopes that the GIA will also help with this. The Ministry is also working to agree a list of specific organism priorities across the whole biosecurity team, which should help with prioritising.

New Zealanders need to be kept aware of biosecurity

2.18 The expectations of the 2003 biosecurity strategy, that the public would be aware of and take part in biosecurity, remain relevant. Public vigilance and information from outside the Ministry about pests and diseases help significantly in passive surveillance. High awareness of what to report and how to report are critical to success. The Ministry has little direct control of this, so seeks to influence behaviour by communicating effectively.

2.19 Public awareness of biosecurity needs constant reinforcing. The Ministry recognises the need to improve reporting, not just in the quantity, but also the quality of reports. It has carried out research to better target effort to improve notifications, and is preparing improvement plans, such as the enhanced notifications project.

2.20 One way that the Ministry has raised awareness in the past is through dedicated biosecurity branding, which it introduced in 2004. The original objective was to present a co-ordinated visual identity to grab the public's attention and highlight the fact that all New Zealanders need to be vigilant in their efforts to protect biosecurity.

2.21 The main benefit of using a brand is the awareness it generates in the minds of the target audience. The private sector is adept at branding, and building a brand is regarded as a long-term investment. Significant investment has been made into the biosecurity brand over many years. For example, during the didymo response, the Ministry invested more than $2 million in the "Check, Clean, Dry" campaign

and research shows that public awareness of this is high. This represents only one part of the total past investment in the "Biosecurity New Zealand" brand.

2.22 Biosecurity New Zealand no longer exists as an entity, but we consider that there is more to be gained from modifying and integrating the old brand (or its essence) into something appropriate for the new Ministry rather than discarding it. Some response partners agree.

2.23 At a time when public engagement needs constant reinforcing, a complete change of brand will mean that the benefit of much of the previous investment will be lost. For public-facing biosecurity activities, retaining the basic elements of the old brand (colour scheme and the word "biosecurity"), while incorporating it into something more appropriate to the new Ministry's aspirations, would enable the Ministry to take advantage of the previous investment.

Measuring the effect of surveillance could be improved

2.24 There is no cost-benefit analysis of surveillance programmes. The Ministry recognises the value of cost-benefit analysis, but reports that it finds this challenging. Investing in long-term surveillance programmes for potential incursions may be difficult to justify when there are no detections. For example, the Queensland fruit fly surveillance programme costs about $1 million a year. Between 1996 and 2012, there were no detections and there had been no incursions. The ability to detect one male fruit fly in May 2012 demonstrated that the investment in the surveillance programme was worthwhile because it enabled a rapid and effective response. This allowed New Zealand to maintain its status of being free of Queensland fruit fly .

2.25 Like insurance, evaluating the cost-benefit of surveillance can be difficult until it finds something, because it relies on projecting potential harm and calculating the costs and benefits. But, without robust cost-benefit analysis, there is a risk that surveillance is not given proper priority.

2.26 The Ministry reports that it has struggled to come up with good outcome-based measures and claims that surveillance is a technically difficult area to prepare outcome-based measures for. However, this is not a valid reason for not attempting it.

2.27 In 2002, the Prime Review reported that it:

> *... was not able, during its interview programme, to identify many performance indicators that are applied to measuring the effectiveness of surveillance objectives ... in our view this is a significant deficiency in biosecurity surveillance;*

it is essential that, as far as possible, output KPIs [key performance indicators] be set for critical objectives and it is desirable to have them for the total programme.

2.28 The Ministry's current performance measures reflect what can be measured easily. At present, the Ministry measures success on the achievement of survey objectives. These simple measures include budget achievement, timely reporting, and delivery of innovative practice. The absence of more meaningful performance measurement tools means that the Ministry will find it difficult to determine the effectiveness and efficiency of its surveillance programmes.

Progress on surveillance

2.29 The Ministry recognises that it needs to improve surveillance and has made some progress.

Joint working on surveillance with external parties is good

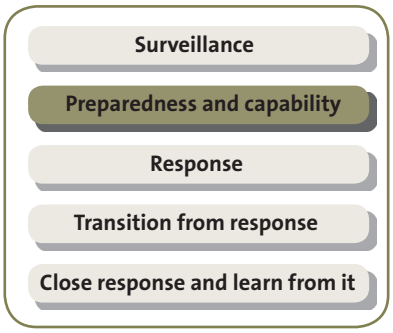
2.30 The Ministry has demonstrated that it can work well with external parties in surveillance. For example, the Ministry helped to design the New Zealand Forestry Owners' Association's surveillance system. The Ministry also collaborates and shares information with others about high-risk surveillance sites. There are other examples of joint surveillance with industry, such as work on avian influenza and on detecting brain and nervous system diseases known as transmissible spongiform encephalopathies (TSEs). Joint working and collaboration provides a wider knowledge base, which allows interested parties to contribute to biosecurity.

Surveillance procurement has improved

2.31 The Ministry has set up a surveillance panel, increasing understanding of the surveillance market's capability. All surveillance work is now dealt with through the biosecurity surveillance panel, which has streamlined the tender process. Another aim is to provide contractors with longer contracts and more security, to promote innovation. Some contractors are now working jointly, which is good for building capability. The surveillance panel includes some Ministry scientific staff, so this is also an opportunity for greater interaction and communication. The surveillance panel is an opportunity to produce benefits for the Ministry.

Part 3
Preparedness and capability

3.1 In this Part, we discuss preparing for incursions, including foot and mouth disease, and opportunities to strengthen capability.



Summary

3.2 The latest restructure provides an opportunity for a fresh look at biosecurity readiness and response. However, biosecurity's long-term track record of delivering change is not good and the new management team have inherited some big challenges.

3.3 The Ministry's plan for dealing with an outbreak of foot and mouth disease is weak. The Ministry is aware of this and preparing for foot and mouth disease is now a higher priority. Work is under way and some improvements have been made, but there is a lot to do. We found a lack of preparedness in several areas. More than $8 million has been invested in foot and mouth disease vaccine without a plan for deployment.

3.4 The Ministry has lacked a strategic approach to capability. This includes workforce planning and, with some exceptions, its approach to information and information technology. Both of these areas represent serious risks for the Ministry.

3.5 Exercise Taurus 2012 was the first foot and mouth disease simulation since 2005. The Ministry is proposing more regular testing of a range of diseases, which is a significant improvement. Not enough simulation and testing of systems means a lack of assurance about whether plans and preparations are fit for purpose.

3.6 Contracting practice was criticised in 2007 by Audit New Zealand, and by 2011 performance had improved considerably. But the Ministry was advised that maintaining this performance was unlikely, unless action was taken. In 2012, response partners report that contracting with the Ministry is inefficient and frustrating.

3.7 The National Biosecurity Capability Network is a sound idea but, after three years, has not yet delivered what was envisaged. There are opportunities to reconsider how this, and the Ministry's arrangements with AsureQuality, should work in future.

Preparing for incursions

In the past not enough priority was given to being prepared

3.8 For some time before the recent restructuring, the frequency of responses and a lack of priority for preparing for threats meant that responding to current threats took precedence over being proactive and preparing for potential threats.

3.9 The Ministry defines this proactive non-response work as business as usual (BAU). As a response is activated, Ministry staff join the response team and leave behind their BAU work. Many staff report an uncomfortable, improperly managed, tension between working on responses and working on preparing proactive plans and tools that would help mitigate risks from future incursions. In the past, this has been the main reason BAU work was often delayed or did not take place. Without clear leadership and direction about priorities, staff have found it difficult to prepare for possible threats.

Business planning has not always reflected the effect of responses on preparedness

3.10 Responding to incursions often means BAU work stops or is delayed. The potential for staff to be diverted from BAU work onto response teams is effectively a reduction in overall capacity. However, this reduction has not always been reflected in business planning. When BAU is stopped or delayed, a large backlog of work can build up. For example, during the Psa response, the Plant Health Environment Laboratory had to re-prioritise its BAU work to release resources to work on the response. This resulted in an eight-month backlog of BAU work.

3.11 The lack of realistic business planning also affected the preparation of new response plans and the testing of existing response plans. On paper, the Ministry has 18 plans for high-risk organisms in various states of completion. Insufficient resources have meant that many of the plans have not been completed or tested to ensure that they are fit for purpose.

3.12 Plans need to be reviewed regularly to reflect wider changes in technology and society. For example, the 2012 Queensland fruit fly response highlighted that the Ministry was unaware of the availability of 24-hour, seven-day translation services, which delayed the response's communication with some sections of the public. It is unrealistic to expect the tension between response and BAU work to disappear. Managing it will require acknowledging the effective reduction in capacity and reflecting this in ambitions and work plans.

Recommendation 1

We recommend that the Ministry for Primary Industries make all biosecurity planning more realistic by ensuring that plans reflect likely constraints on resources and reflect more accurately the capacity available to deliver them.

Recommendation 2

We recommend that the Ministry for Primary Industries complete response plans for high-risk organisms, including foot and mouth disease, and review them at regular intervals to provide assurance that they are fit for purpose.

Preparatory work did not always consider practical and operational matters

3.13 The Ministry's Psa response in 2010 highlighted the lack of preparation for large responses, including the necessary capacity for the volume of work required. Reserve capacity does not need to be in-house, where it might inefficiently sit idle for long periods – it could be sourced externally when needed. However, as demonstrated in the Psa response (see paragraph 3.14), without careful preparation and planning, extra capacity of the appropriate quality standard is unlikely to be available when required at short notice.

3.14 In the Psa response, we found that:

- Laboratory capacity is sometimes a bottleneck that could be better prepared for. Kiwifruit producers perceived the length of time taken to determine whether their property was infected to be the biggest hindrance to an effective response. One of the first tasks in an incursion is to discover how far the pest or disease has spread so that the response can be targeted. At first, it took an average of 10 days to sample, test, and report back. Without quick testing, it was difficult to measure how widespread Psa was. The response team quickly identified the need for a quicker test and extra laboratory capacity. A quicker test was prepared, but finding extra laboratory capacity outside the Ministry was more difficult because it needed to meet the right quality standard. This concept was not well understood by all parties and it took more than two months to get this in place. It is critical that the Ministry investigates and prepares for making best use of external laboratory capacity and capability so that it is ready to be deployed at short notice.
- Large amounts of waste plant material needed to be destroyed. The first attempt was to burn the waste material, but this method could not cope with the volume of waste generated and a decision was made to bury it.

The Ministry had no plans for dealing with this, so the Ministry and the local council collaborated to quickly identify a site. However, in the high-pressure environment of the response, the Ministry and local council did not consult local iwi, which caused problems and introduced delay and tension.

There have been some recent improvements to preparedness

3.15 The Ministry has recognised the need for more plan reviews and testing of systems. A review of the Queensland fruit fly response plan is under way. This and Exercise Taurus 2012 are both signs of a new attitude to testing. The Ministry has prepared a plan for consolidating and acting on recommendations from the Exercise Taurus 2012 simulation and other recent reports. The recommendations from these reviews have been grouped under themes, and each has been established as a programme of work with defined governance arrangements.

3.16 The restructure should also improve preparedness. Preparatory work and partnerships are now in one directorate, which is in the same branch as the response directorate (see paragraph 3.51). This grouping of directorates should allow better prioritisation through a single Deputy Director-General. We consider that this goes some way to resolving the balance between prioritising response and preparedness. However, the new preparatory work and partnerships directorate has few staff and focuses on co-ordinating preparations, not on preparedness work. And, although the restructuring is a positive move, without proper prioritisation, performance management, and accountability, the new structure will not completely resolve the difficulties of balancing the demands of response and preparedness.

Preparing for foot and mouth disease

3.17 The Ministry has made some recent progress, but we consider that, overall, it is under-prepared for foot and mouth disease. We reviewed aspects of the Ministry's preparedness, limiting our analysis to modelling, laboratories, carcass disposal, and vaccination – all tangible preparedness matters that caused problems during the outbreak of foot and mouth disease in the United Kingdom in 2001.

Foot and mouth disease is a significant biosecurity threat to New Zealand

3.18 In 2002, the Reserve Bank of New Zealand estimated that an outbreak of foot and mouth disease would reduce gross domestic product (GDP) by $8 billion after one year and $13 billion after two years (in 2012 prices). In 2012, New Zealand's GDP was $207 billion, which means an outbreak could devastate the country's economy.

3.19 Foot and mouth disease is an infectious viral animal disease and spreads quickly among closely confined susceptible animals. It is easily recognised in cattle and pigs, but sheep often do not display symptoms so the disease can go unnoticed. There is a risk that an outbreak might not be detected quickly.

Foot and mouth disease is a complex disease

3.20 There are seven different forms, or serotypes, of the foot and mouth disease virus. Each serotype behaves slightly differently and produces a distinct response in an animal's immune system. Infection with one serotype does not give immunity to another serotype. The disease continues to spread around the world. This means that the Ministry's preparations for an outbreak should be sophisticated enough to deal with the disease's complexity and variability.

3.21 The Ministry is aware of the risk of an outbreak. In 2002, the Ministry made an assessment of the risks that foot and mouth disease poses to New Zealand.[6] The Ministry concluded there was a low likelihood of the virus entering the country in legally imported animals and animal products because of the risk management measures in place. In addition, strict border controls are designed to minimise the risk of illegal meat importation.

Preparing for foot and mouth disease is now a higher priority but there is much to do

3.22 In late 2010, the Ministry identified that there were many ways in which preparations for a foot and mouth disease incursion needed strengthening. Since 2005, some structural limitations had built up and the Ministry identified that it needed to:

- set up better overall governance for foot and mouth disease preparedness to reduce the risk of duplication or gaps;
- clarify decision-making responsibilities – that is, who is responsible for deciding what;
- define accountability for approving policies and their underpinning work;
- create an agreed foot and mouth disease scenario for all partners to prepare against; and
- update the foot and mouth disease response plan to ensure that it was up to date, comprehensive, formally approved, and widely discussed with industry and other affected parties.

3.23 The Ministry has begun to address these weaknesses, but there is still much to do. Recent work has delivered a joint Ministry-industry review of foot and mouth

6 Pharo, HJ (2002), "Foot-and-mouth disease: an assessment of the risks facing New Zealand", *New Zealand Veterinary Journal*, Vol. 50, No. 2, pages 46-55.

disease preparedness in September 2011, the *Whole-of-Government Biosecurity Response Guide* in June 2011,[7] and Exercise Taurus 2012, the first large-scale simulation for seven years.

3.24 Exercise Taurus 2012 was a successful learning opportunity. One effect of the exercise was to highlight that the restructuring and staff turnover had reduced the Ministry's familiarity with foot and mouth disease and that this needs rebuilding.

3.25 The Ministry's plan for dealing with foot and mouth disease (FMD) is weak. We found that the Ministry's *FMD Biosecurity Response Plan version 12.0* (the FMD plan) is more a collection of policy statements than a comprehensive plan. The Ministry considers its FMD plan to be a working document and the basis for discussion and review. However, Appendix 10 in the FMD plan, which refers to carcass disposal guidelines and foot and mouth disease modelling, is empty. The plan leaves the Ministry under-prepared to deal with some practical matters.

The Ministry has the tools to model a foot and mouth disease outbreak but needs to take this work further

3.26 Disease simulation models can be valuable in preparing for an incursion. They are useful for answering questions about the effects of outbreaks and control actions before an outbreak happens. In partnership with Massey University and AsureQuality, the Ministry prepared the New Zealand Standard Model, which has been tailored to fit the known characteristics of foot and mouth disease and New Zealand's industry structure, patterns of animal movement, and other important criteria. The New Zealand Standard Model is significant step forward because this means the Ministry can experiment with outbreak scenarios using different control and surveillance strategies.

3.27 The Ministry has introduced more consistency to its preparations by creating a standard foot and mouth disease outbreak scenario (the "standard scenario"). A scenario is a set of assumptions about the patterns and behaviour of a future outbreak. The standard scenario has been chosen because it is seen as being the "most likely" and is an improvement over the previous scenario known as the "20-10-10". The standard scenario is a significant step forward in ensuring that the Ministry, AsureQuality, and other interested parties plan for an outbreak in a consistent manner. The Ministry can compare how all parties prepare and ensure that any further work is consistent.

3.28 However, there are substantial lessons still to be learnt from the United Kingdom's experience in 2001. We reviewed how the Ministry's scenario modelling helped preparedness planning and compared it with the United Kingdom's experience. Figure 4 shows this comparison. The idea of interested parties planning

7 Available at http://brkb.biosecurity.govt.nz.

consistently using the standard scenario is sound, but the Ministry needs to go further if it is to maximise the value of the United Kingdom's experience.

Figure 4
New Zealand's 2012 preparedness for foot and mouth disease compared with the United Kingdom's preparedness and experience in 2001

United Kingdom preparedness	United Kingdom experience	New Zealand preparedness
Plans were based on the most likely scenario.	The outbreak was far worse than the most likely scenario.	Preparedness is based on the most likely scenario.
Plans assumed that no more than 10 premises would be infected at any one time.	By the time of first detection, at least 57 premises were infected.	The standard scenario* assumes 21 infected premises at the time of first detection.
Plans did not consider a worse case scenario.	The United Kingdom authorities did not stress-test their response plan and found it difficult to scale up. More than 200 emergency instructions during the outbreak reflected policy changes being made "on the fly" and led to making decisions haphazardly, poor outcomes, and a loss of public confidence.	Plans do not consider a worst-case scenario.

* The standard scenario assumes a "silent spread" of 9 days (see Figure 5). Silent spread significantly influences the size of an outbreak.
Sources: Columns 1 and 2: United Kingdom Cabinet Office (2002) *Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report* (*Anderson Inquiry*, available at http://webarchive.nationalarchives.gov.uk; National Audit Office (2002) *The 2001 Outbreak of Foot and Mouth Disease*, available at www.nao.org.uk. Column 3: Ministry for Primary Industries.

3.29 Good practice suggests that one way to achieve a stronger position is to prepare a worst-case scenario. We found no evidence of worst-case scenario planning. The Ministry's modelling team have prepared two other scenarios. These were prepared for another purpose and use some different assumptions from the standard scenario. Recognising these limitations, we have compared them with the standard scenario in the absence of anything else. Figure 5 shows that the medium and large outbreak forecasts are much bigger than the standard scenario.

Figure 5
Modelled scenarios for foot and mouth disease outbreaks

Outbreak criteria	Size of modelled outbreak				
	Standard	Medium		Large	
	Number	Number	Times bigger than standard scenario	Number	Times bigger than standard scenario
"Silent spread" period chosen (days)*	9	21	*2.3*	21	*2.3*
Average length of outbreak (days)	71	105	*1.5*	225	*2.4*
Maximum length of outbreak (days)	92	281	*3.1*	293	*3.2*
Maximum number of infected premises	280	2650	*9.5*	3362	*12.0*
Total number of animals killed (see footnote 9)	33,429	313,714	*9.4*	982,602	*29.4*

*"Silent spread" is the time between the first infection and diagnosis. It is a significant influence on the size of an outbreak. This is a user-selected input to the model. A 21-day silent spread was a significant factor in the eventual size of the 2001 outbreak in the United Kingdom.
Source: Ministry for Primary Industries.

Despite some good progress, the Animal Health Laboratory's preparations for foot and mouth disease are not yet fit for purpose

3.30 Given the highly infectious nature of the foot and mouth disease virus and its ability to spread rapidly among susceptible animal populations, accurate and rapid diagnosis of both the initial incursion and subsequent cases from infected properties are crucial to managing an incursion. For many years, New Zealand relied on sending samples to a specialist centre in the United Kingdom. However, this reduced control and could delay the diagnostic process. In 1996, the Ministry helped to design the current enhanced PC3 bio-containment laboratory (see paragraph 3.32) which is part of the Animal Health Laboratory (AHL).

3.31 During the last five years, the AHL has worked on preparing for a foot and mouth disease outbreak. Our evaluation of these preparations shows that there is still much to be done to make these fit for purpose, especially to work out the practicalities of support and logistics. Appendix 2 lists the comparative strengths and weaknesses of these preparations.

The Ministry has been slow in planning for laboratory replacement

3.32 The AHL is accredited to the competence standard ISO:17025 and is audited regularly. For foot and mouth disease and other infectious diseases, containment in the laboratory is important to stop a disease spreading. One part of the AHL is classed as a PC3+ or enhanced PC3 level laboratory (the enhanced PC3 bio-containment laboratory) and meets the necessary standard.[8] This means that it has the second-highest possible level of micro-organism containment, with elements of the highest level. It is the country's only laboratory of this type.

3.33 Designed in 1996, the enhanced PC3 bio-containment laboratory has a design life of 15 to 20 years. Because of its age, it is starting to show wear and tear, maintenance needs are growing, and the risk of a breakdown is increasing. If a breakdown happened during a foot and mouth disease response, it is likely that the enhanced PC3 bio-containment laboratory would be shut down, rather than risk an escape of the virus. This would be a major barrier to dealing effectively with an outbreak.

3.34 The AHL's managers have thought through some of the work flow implications of a larger outbreak. However, they have not yet recorded these thoughts, or the practicalities of how to deal with them in the laboratory plan. A larger outbreak may mean that foot and mouth disease work would be done in laboratory areas with a lower level of containment and/or the laboratory would have to significantly modify its operating methods. Both of these options could increase the risk of major problems, such as virus escape and/or misdiagnosis.

3.35 Funding has been made available for preparing a business case for laboratory replacement in 2012/13. Early indications, which are subject to change, are that a new laboratory could be in operation sometime around 2017/18. However, until a new laboratory is in place, significant risks to foot and mouth disease capability remain.

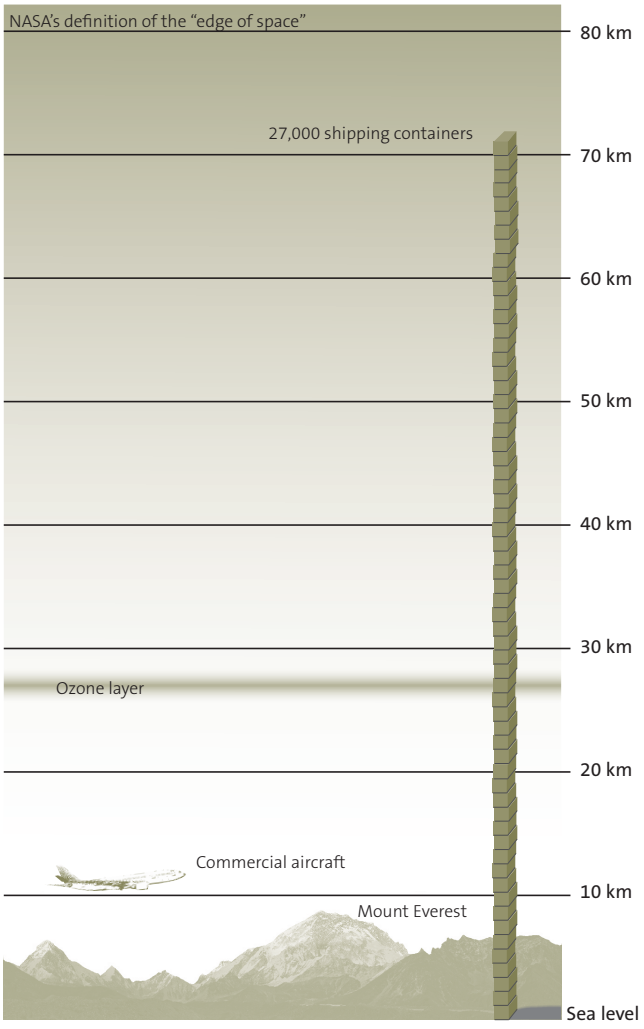
The Ministry is under-prepared for carcass disposal

3.36 In 2001, the United Kingdom's foot and mouth disease outbreak caused huge logistical problems in disposing of slaughtered animals. More than four million were slaughtered and the backlog awaiting disposal peaked at more than 200,000 carcasses. The Ministry's plan does not contain any details on how carcass disposal will be dealt with. The Ministry researched disposal options in 2004, but we could not find any evidence that this was converted into an operational plan. This means that the Ministry has put resources into preparedness research, but failed to realise the benefits by putting it to practical use.

8 AS/NZS 2243.3:2002 – Safety in Laboratories: Part 3 – Microbiological aspects and containment facilities. The standard is incorporated in the Hazardous Substances and New Organisms (Low-Risk Genetic Modification) Regulations 2003.

3.37 The New Zealand Standard Model's large outbreak scenario estimates that about a million animals would be slaughtered (see Figure 5). Figure 6 tries to show how big the size of this problem could be.

Figure 6
Potential difficulties in disposing of slaughtered animals during a foot and mouth disease outbreak



We estimate that one million carcasses of full-grown animals (in the same proportions of cattle, pigs, and sheep as the 2001 UK outbreak) would fill the equivalent of about 27,000 standard 20-foot equivalent unit shipping containers.

Sources: UK outbreak data from National Audit Office (2002) *The 2001 Outbreak of Foot and Mouth Disease*, available at www.nao.org.uk. Typical animal dimensions data are from Federated Farmers of New Zealand (NZ) Incorporated.

More work on planning for the potential use of vaccination is needed

3.38 Internationally, vaccinating animals is considered an important potential tool in managing an outbreak of foot and mouth disease. Generally, there are two vaccination strategies that are used to help control an outbreak:

- vaccination to live – emergency vaccination to protect animals from disease in a restricted area; and
- vaccination to die – emergency vaccination of animals in a restricted area to reduce the potential of the disease spreading, with slaughter at a later date. This approach is effectively a holding measure should "stamping out"[9] be overwhelmed.

3.39 Each of the vaccination strategies will have different implications for biosecurity response logistics, international trade, disease-free status, and public opinion. However, because vaccination during an outbreak is not a simple remedy and can be carried out for different purposes, it is not likely that the public would readily understand the different vaccination strategies.

3.40 After the 2001 outbreak of foot and mouth disease in the United Kingdom, the Anderson[10] inquiry in 2002 reported that:

> *... vaccination was one of the most hotly debated, yet misunderstood, aspects of the FMD epidemic ... contingency planning for vaccination was minimal ... the scientific and practical pros and cons of vaccination options and their implications for trade should have been thought through in advance of the outbreak.*

3.41 The Ministry carried out some research on vaccination in 2002 and 2003, including evaluating its use in the Netherlands' outbreak of foot and mouth disease in 2001. This work showed that the logistical requirements for vaccinating could be considerable. Also, the justification for "vaccination to die" breaks down if the resource required to implement it hinders other essential tasks, such as detecting and slaughtering infected animals. Because of the complexity surrounding vaccine use, it is possible that the vaccine may never be used.

3.42 Additional Ministry work in 2009 included a technical evaluation of the Ministry's vaccine bank and preparation of a vaccination decision support tool. This tool, which draws on international best practice, provides standardised and generic decision criteria supported by a decision tree flow chart. This should help the

9 Current MPI policy is to overcome foot and mouth disease through the quarantine and slaughter of all susceptible animals that are infected or exposed to the disease, informally known as "stamping-out".

10 United Kingdom Cabinet Office (2002), *Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report* (Anderson Inquiry), available at http://webarchive.nationalarchives.gov.uk.

Ministry to make better decisions, should vaccination be required, but has not been tested or used in a simulation.

3.43 However, despite all of the previous work by the Ministry, we found no evidence of an operational plan setting out the practical requirements of vaccination and how these will be dealt with. We have reviewed the Ministry's undated document "Operating plan for the management of vaccines" but we consider this to be a policy statement rather than a practical plan. The Ministry's Knowledge Base contains generic guidance on organism management and contains some specific guidance on managing a fruit fly incursion, but there is none about foot and mouth disease vaccination.

3.44 New Zealand was a member of an international foot and mouth disease vaccine bank until about 2005, when the international agreement ceased. Since 2005, the Ministry has maintained access to a foot and mouth disease vaccine bank through a five-year contract with a commercial vaccine manufacturer (Merial) in the United Kingdom. The 2005 contract was renewed in 2010 for a further five years. The 2010 contract renewal process included an options appraisal to determine the best option for maintaining access to a vaccine. Since 2005, the Ministry has spent about $8.5 million on vaccine.

3.45 The original 2005 contract was funded though a "New initiative" funding bid in 2004/05. The documents supporting this funding bid contained the following unrefined cost-benefit analysis:

> *... In the event of a FMD outbreak resulting in a 6 billion dollar cumulative loss in GDP, the cost of approximately three million to establish a New Zealand reserve is minor.*

3.46 Overall, we conclude that the Ministry has no operational plan of how it will use the foot and mouth disease vaccine if it is ever needed. This is a serious weakness because there are many potential problems that need to be foreseen and planned for if vaccination is to provide any advantage in managing an outbreak.

3.47 The vaccine is a potentially useful tool, but the Ministry is not well positioned to deploy it cost-effectively. Without an operational plan or any modelling of vaccine deployment, the Ministry:

- cannot determine the direct costs of deploying the vaccine; and
- cannot quantify the benefits of using the vaccine.

3.48 Without a robust idea of costs and benefits it is difficult to show that the investment of $8.5 million is justified.

Generally, the Ministry is improving its preparedness for foot and mouth disease

3.49 In August 2012, the Ministry approved a plan to strengthen preparations for a foot and mouth disease incursion.[11] Figure 7 shows those parts of the plan that are most relevant to our audit. If successfully put into effect, these activities will strengthen arrangements, but will take time.

Figure 7
How the Ministry for Primary Industries is improving its preparedness for a foot and mouth disease outbreak

Activity	Deadlines and progress
Getting better prepared for an outbreak by: • setting up an agreed national strategy for foot and mouth disease; • developing a vaccination policy and approach; • work to allow for disposing of carcasses in an emergency; and • updating the response plan.	The full programme was planned and agreed by 31 December 2012, subject to industry engagement through GIA and the foot and mouth disease joint working group.
Improving how the Ministry manages a response and flows of information by: • integrating all relevant information systems for responding to incursions; and • regularly using all core information systems so that staff have practised roles for when there is a large response and systems will have improved during smaller events.	Project planned and agreed by 30 June 2013. Began in September 2012 and was then made part of business as usual.
Improve capability and capacity by: • identifying those staff who have the appropriate technical and leadership capability to have the main roles in a response; and • identifying, testing, and strengthening staff leadership skills.	31 December 2012
Prepare exercises to test and check how prepared New Zealand is for a foot and mouth disease outbreak.	30 June 2013
Ensure that there is appropriate infrastructure to maintain high-level containment laboratories.	Stage 1 Business Case under way.

Source: Ministry for Primary Industries.

11 Ministry for Primary Industries (2012), *Biosecurity response preparedness implementation plan for recommendations following Exercise Taurus 2012*.

Recommendation 3

We recommend that the Ministry for Primary Industries prepare better for a potential outbreak of foot and mouth disease by:

- building on Exercise Taurus 2012 and developing and delivering a regular programme of foot and mouth disease testing and simulation;
- completing an early simulation to test the Animal Health Laboratory's foot and mouth disease readiness, which is a potential bottleneck but remains largely untested;
- reducing the risk of a breakdown in the enhanced bio-containment laboratory by replacing it at the earliest possible date;
- creating a plan to undertake carcass disposal across a range of outbreak sizes; and
- creating a plan of how the vaccine could be used, demonstrating that it is practical to do so, and the potential value for money that would be provided from investing in the vaccine.

Organisational capability

What we mean by capability

3.50 For biosecurity, the Ministry needs a pool of different capabilities to deal with incursions. Capability includes personnel, training, equipment, facilities, information, organisation, and logistics. These are used in various combinations to respond to biosecurity incursions. Capability needs to be carefully managed and maintained over time.

Opportunities to improve capability through restructuring

3.51 The creation of the new Ministry for Primary Industries in April 2012 was the end result of merging the Ministry of Agriculture and Forestry with the New Zealand Food Safety Authority in July 2010 and the Ministry of Fisheries in July 2011. This created a single organisation focused on exports, productivity, and protection from biological risks.

3.52 The restructure has resulted in new managers with different and more diverse backgrounds who can look at the organisation from a different perspective. The new management structure is an opportunity for a fresh look at biosecurity response and readiness. The new structure brings surveillance, response, and

investigation and diagnostic centres into one branch led by the Deputy Director-General of Compliance and Response. Within the branch, there are two new directorates:

- Preparedness and Partnerships, which creates a single point to co-ordinate all preparedness work and partnership business; and
- Investigation Diagnostic Centres and Response, which brings together surveillance, incursion investigation, laboratories, and response into one directorate.

3.53 Responsibility is now clearer and less splintered. The new arrangements are more coherent, which should create conditions for more collaborative work between the various Ministry teams involved in biosecurity response and preparedness.

People capability

Biosecurity capability and workforce planning has been weak

3.54 For all organisations, there is a trade-off between investment, capability, and consequent risk. It is vital that the Ministry knows what capability it needs so that it can manage risk. We found no evidence that, before 2011, the Ministry had a strategic approach to capability. We found no history of systematic analysis of capability and how this compared with what was needed to manage biosecurity threats.

3.55 Workforce planning is critical. An effective workforce plan ensures that an organisation has a workforce of the right size, with the appropriate skills, in the right place. It encourages managers to prepare and plan for changes rather than react to them. It ensures that organisations going through change are better equipped to handle the workforce implications.

3.56 The Treasury's Better Administrative and Support Services (BASS) report provides information about the cost, efficiency, and effectiveness of administrative and support services in the public sector. It benchmarks performance against a set of good practice standards. The BASS report defined workforce planning as a statement that:

> *... anticipates the workforce requirements of the organisation over the medium-term (at least three years) and an action plan agreed by the Executive/Corporate Management Team which sets out how those requirements are met and is monitored on a 6 monthly or more frequent basis.*

3.57 Our review of the 2010/11 BASS data shows that the Ministry failed the workforce plan standard.

Complex work needs specialist staff

3.58 We have chosen to show some of the capability challenges the Ministry faces in the marine environment and the aquaculture industry. The marine environment is difficult and complex to work in because less is known about marine diseases than land-based diseases. Although there will be some new and emerging pests and diseases for land-based animals and plants, new and emerging pests and diseases are likely to be more prevalent in the marine context. Figure 8 shows that aquaculture is a growing industry and likely to generate more incursions requiring responses.

Figure 8
Increasing importance of aquaculture and biosecurity

Aquaculture New Zealand estimates that the aquaculture industry is worth more than $380 million and it is expanding. The Government is committed to enabling the aquaculture industry to achieve its goal of $1 billion annual sales by 2025. By around 2015, growth is forecast to increase more rapidly as the new capacity being introduced leads to increased production. Ministry staff and stakeholders report that the focus on this sector is likely to increase reported incursions and biosecurity issues.

Sources: Ministry for Primary Industries, Government Aquaculture strategy, Aquaculture New Zealand http://aquaculture.org.nz/industry/overview/.

3.59 Complex responses need specialist input. For example, there are hundreds of species of fish and shellfish but scientists have only limited knowledge of their endemic disease status or exposure to exotic diseases. Compared with many agricultural farming enterprises, aquaculture's stocking density and stock movement are generally high. These are biosecurity risks.

3.60 When we looked at the example of juvenile oyster mortality, we found that oyster deaths were because of a virus, but the outbreak was most likely brought on by environmental factors. Investigating and responding to these types of outbreaks, where many factors contribute to the situation, is difficult and requires specialist input.

3.61 The Ministry is doing more work in aquaculture, but laboratory capacity and capability is not keeping pace. The growth of aquaculture has led to more work for the AHL. A cap on headcount means that any increase in staff involved in aquaculture must come from within the Ministry's resources. The Ministry needs to make choices about where it commits staff resources and this requires the setting of priorities. However, without a strategic view of the workforce and its capability, it is difficult to see how the Ministry can prioritise. Without access to appropriate expertise, there is a risk that responses may be delayed or be beyond the Ministry's capability, with subsequent economic loss or degradation of the environment.

The Ministry is planning improvements

3.62 The Ministry's *Statement of Intent 2012-2015* commits to improving capability, including creating a strategy for people capability and leadership training, to be supported by new information systems for human resource management, records management, and time recording (see paragraph 3.65 for more information about the Ministry's new IT plan). If put into effect, this should mean a stronger, longer-term approach to improving capability.

Information capability

3.63 Information is a significant resource in a biosecurity system. Information must be well organised and shared so that decisions and efforts are well co-ordinated and focused. Information is also valuable in determining how well the system is performing. There should be routine and regular use of information to measure performance. Without a sound approach to information, there are risks of gaps, duplication, inconsistency, and poor accessibility.

A strategic approach to information technology has been lacking

3.64 The Ministry has a poor track record in this area. There are signs of improvement, but the task is large.

3.65 An Information Systems Strategic Plan (ISSP) sets out the Ministry's plans for how information technology (IT) will support its organisational objectives and mission. Many people who worked at the Ministry in 2009 no longer work there, which made it difficult to find out with certainty if the 2009 ISSP was fully put into effect – but it is unlikely. Reported barriers include extended redrafting, organisational restructuring, and a lack of priority. This means that many of the Ministry's information systems are not as integrated or as functional as they could be.

3.66 The Ministry's earlier failure to prioritise a strategic view of IT has resulted in several problems that affect its biosecurity operations:

- Information systems are fragmented. For example, the Ministry now has six different organism databases and more than 600 separate IT systems. Having so many systems can lead to inefficiency and poor data quality.
- Risks have been poorly managed. Obvious risks have built up, such as staff who are system-critical because they are the only ones with enough expertise. If they left or fell ill, there would be no one with the same expertise available.
- There is a risk of poor data quality. Some IT systems do not communicate with one another. For example, both laboratories use the Laboratory Information Management System. This cannot communicate with the Ministry's other systems, so data has to be entered twice, which is inefficient and a risk to data quality.

Poor information governance

3.67 Information governance should include creating, storing, using, archiving, and deleting information. The Gartner Group, a global information technology research and advisory company, states that information governance:

> *... includes the processes, roles, standards and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals.*[12]

3.68 The costs of poor information governance can include failed business processes and lower productivity. Lost, inaccurate, or incomplete information can mean higher costs and extra work.

3.69 Biosecurity operations have not followed sound information governance practice. There has been little or no recognition of the resulting risks. Many biosecurity responses rely on the use of stand-alone spreadsheets and databases for capturing and analysing information, but this introduces risks. These programs are not designed for multiple users, so sharing is difficult and they do not have inbuilt back-up to safeguard data. In smaller responses, this is not such a problem. However, in large responses, this can cause significant problems. For example, staff on the Psa response had difficulties in managing data between teams and keeping control of different versions of spreadsheets and databases. Without good information, there is a risk of poor decision-making.

Risks of current information systems

3.70 The Ministry's large responses depend on an information system that carries major risks. The Incursion Response System (IRS) supports large biosecurity responses. Work on refining IRS has been ongoing since about 2002. The Ministry has invested about $2.25 million so far. IRS has particular characteristics that present challenges:

- IRS is suitable only for big responses, such as Queensland fruit fly or foot and mouth disease. It has been used only seven times during the last seven years. Keeping staff up to date with the system is difficult and some are unfamiliar with it.
- Setting it up takes a long time, typically a full day, so the decision to use it needs to be made early in the response – otherwise, the information lags behind the response, reducing its usefulness.
- The weakest point is the timing of the decision to use it. This is not easy because this point comes when the decision-making environment is busy, high-pressure, and ambiguous. Failure to do so early enough may mean IRS never catches up with the response, which limits its effectiveness.

12 *Gartner IT glossary*, available at www.gartner.com/it-glossary.

- IRS relies on large amounts of manual data entry, which can be inefficient and costly.

3.71 Figure 9 shows how these risks can combine during a response, if not mitigated properly.

Figure 9
Using the Incursion Response System in large responses

The recent Psa response used IRS, but the decision to use it was about two weeks too late. Despite this, the response team persevered with using it because no alternative was available. Data entry required 15 staff and cost about $60,000, but the system continued to lag the response, which limited its effectiveness.

Source: Ministry for Primary Industries.

Some information system improvements are under way

3.72 Some IT systems are making reasonable progress. Farms Online (FOL) has been successful so far. FOL is a database of information about the ownership and management of all rural properties, land use, and stock. The project is on time, to budget, and performance has exceeded its targets. This should ensure that essential information for a quick response to a biosecurity incursion is available.

3.73 The Biosecurity Response Knowledge Base (the Knowledge Base) underpins the Ministry's response system. This is a store for the flowcharts, standards, and other tools for leading and managing biosecurity responses. As a toolbox to support responses, the Knowledge Base is innovative, comprehensive, well thought out, and accessible from the Internet.

3.74 The National Animal Identification and Tracing (NAIT) project has been completed on budget and on time. NAIT is an animal identification and tracing scheme linking people, property, and livestock. An earlier State Services Commission review found that NAIT has good support among interested parties, external and internal. The project team prepared the final phase on time despite several challenges, but had to make improvements to some aspects of decision-making, risk management, and project management.

3.75 The Ministry is improving the way it handles information. The Senior Leadership Team has approved a new ISSP for 2012, which sets a direction for the next five years. In contrast to the 2009 ISSP, which was focused on hardware and software projects, the 2012 ISSP states that IT should support and enable the Ministry's business. However, despite it being a five-year plan, only the first year has committed funding, which limits its usefulness as a long-term document. If fully

put into effect, the 2012 ISSP should bring a greater degree of standardisation and integration and allow the Ministry to get more benefit from IT.

3.76 Some other improvements to information systems have begun. Work is under way to try to overcome some of the weaknesses by:

- exploring how to get laboratory IT systems to communicate with other systems;
- considering specific software to reduce the use of stand-alone spreadsheets and databases;
- reducing risk by training staff to widen expertise and introducing risk registers for IT systems;
- improving information governance through the forthcoming Information and Data Management Strategy; and
- scoping investment for improving the IRS.

3.77 Better business systems and processes, if put into effect properly, will improve responses to incursions.

Recommendation 4

We recommend that the Ministry for Primary Industries improve its:

- staff capability by preparing a plan to deliver better response experience, training, and induction;
- workforce planning so that it has the appropriate number of staff, with the required skills; and
- creation, use, and storage of information by preparing a formal approach to information governance.

Contracting for external capability

3.78 Most of the people who would manage an incursion are employed by the Ministry. However, in larger responses, contractors provide much of the capacity and capability, especially for dealing directly with the incursion. Also, contractors provide help with specialised technical support and expert opinion.

Contracting with Crown research institutes needs to improve

3.79 Some response partners report that contracting with the Ministry is inefficient and frustrating. A Ministry-wide contracting review by Audit New Zealand in 2007 reported that there was a good framework and policy in place, but practice was weak. Problems included contracts being signed months late, long

after agreements had come into force. Response partners have told us that this still occurs. The 2007 review concluded that the Ministry did not seem to be supportive of Crown research institutes (CRIs) and that there were many short-term contracts that gave CRIs neither certainty nor security and required considerable overheads to set up and manage. The 2007 review recommended that the Ministry use more strategic, long-term partnerships.

3.80 By 2011, Audit New Zealand reported that the Ministry had made significant progress and procurement practice was good, but it faced several immediate challenges in sustaining that performance. These included the loss of the manager chiefly responsible for the improvement in practice and the Chief Financial Officer, who had been a strong supporter of improving procurement. Additional issues were staff turnover in the procurement team and organisational restructures with the merger of the Ministry of Fisheries, which had different procurement practice.

3.81 At the time of our work in 2012, most response partners reported that they did not think the Ministry contracted with them efficiently, as shown in Figure 10.

Figure 10
Views about contracts

Does the Ministry contract with response partners in an efficient way?	
Gum leaf skeletoniser	▼
Didymo	●
Southern saltmarsh mosquito	▼
Kauri dieback	▼
Psa	▼
Juvenile oyster mortality	●
Key ▲ most comments positive ▼most comments negative ◄►views were mixed overall ● insufficient definitive responses	

Note: These views are from response partners for each of the examples we reviewed. See paragraphs 1.23 and 1.26-1.28, and Figure 3.

3.82 We consider that the Ministry has missed opportunities to streamline CRI contracting. The Ministry has not integrated how it buys scientific expertise for response work. Unlike the situation with surveillance work (see paragraph 2.30), there is no panel arrangement for CRI response work. A panel arrangement could potentially provide better value for money, ease response partners' frustrations,

and contribute to meeting one of the 2003 biosecurity strategy's expectations.[13] CRIs told us that the Ministry's contracts were inconsistent and could take too long to prepare.

3.83 One CRI said that it had a master contract and used schedules for different responses. This master contract agreed basic terms and conditions upfront and each transaction afterwards was a simple schedule to the master contract. This is good practice.

3.84 However, most other CRIs told us that the Ministry contracted separately for each response. Using multiple contracts is inefficient, expensive, and slow. It can make contracting unnecessarily difficult. Agreeing standard terms and conditions in a more strategic, longer-term way minimises renegotiation and provides more certainty and security. It could also provide the Ministry with better value for money.

3.85 The Ministry states that all operational activities in a response situation are now delivered through the National Biosecurity Capability Network (see paragraphs 3.88-3.93), which should streamline procurement. However, CRIs are not members of this network.

3.86 The Ministry has indicated that:

- a review of master contracts is a major work-plan item for 2012/13; and
- work is under way on a research procurement strategy, which may help improve the relationship with response partners.

Recommendation 5

We recommend that the Ministry for Primary Industries make contracting simpler, faster, and more efficient for response partners, and consider the use of a panel contract arrangement for procuring response services from Crown research institutes.

13 *Tiakina Aotearoa Protect New Zealand*, Expectation 22 – that the purchase of science is integrated across providers.

More clarity is needed on the roles and responsibilities of AsureQuality

3.87 The Ministry's main contract with AsureQuality is the Biosecurity Response Services (BRS) contract, which the Ministry reports was awarded following a fully contestable Request for Proposal process. Under the BRS contract, AsureQuality provides the Ministry with response field operations. In responses to larger incursions, AsureQuality provides a significant part of the Ministry's operations in the field. It also builds, maintains, and manages the National Biosecurity Capability Network, and allows for an overhead management function. The value of the BRS contract for 2011/12 was about $3.4 million. The BRS contract was created as a result of the Ministry recognising that a change of approach was required. The previous approach included various short-term arrangements with commercial providers that were called on during biosecurity responses.

3.88 Many response partners do not distinguish between AsureQuality staff and Ministry staff. During our audit, we were told of problems with the BRS contract. Sometimes, AsureQuality's role in the response system structure is not well understood. For example, kiwifruit producers did not understand what AsureQuality's role and responsibilities were and felt that the response operations staff they were dealing with lacked capability. As a result, kiwifruit producers considered that AsureQuality's work did not provide value for money. Contractual problems can lead to less effective responses and damage confidence in the Ministry and associated agencies.

National Biosecurity Capability Network arrangements need review

3.89 The National Biosecurity Capability Network (the Network) is a sound concept but has not yet delivered what it was set up to do. In 2009, the Ministry and AsureQuality jointly set up the Network. The Ministry recognised that it was no longer feasible or cost-effective to keep staff and other resources on standby, waiting to be called on during an incursion.

3.90 The Network's objective is to provide certainty that, in any biosecurity response situation, the required capability will be available and ready to act immediately. It aims to do this through a network of people and resources that can be called on to deal with biosecurity incursions at short notice across different responses and locations. At other times, Network members will continue their normal day-to-day business. Members come from various organisations including specialist private businesses, local government, and suppliers of machinery and other equipment.

3.91 The Network should be more efficient than earlier arrangements because it draws on existing capability rather than the Ministry building it from scratch. It also provides greater opportunity for interested parties, such as regional councils and industry, to have their staff with local or specialist knowledge participate in responses. The Network should also eliminate delays associated with forming contracts with suppliers during a biosecurity response.

3.92 Currently, the Ministry has little assurance that the Network will function as intended but it is improving. Between 2009 and 2012, there was no simulation or testing of the Network. A single desk-top deployment test of the Network took place in April 2012. This highlighted several risks and led to recommendations, including doing regular tests of the Network.

3.93 Use of the Network in responses is now more frequent, which should help to improve how it works, albeit in a higher-risk environment than a simulation. The success of this new approach was demonstrated in the 2012 Queensland fruit fly response, where a number of the Network members, including Auckland Council, were deployed as part of the response. However, more assurance is needed that the Network, as configured, will deliver consistently when required.

3.94 Network development has been slow. The Network concept was radically different and required the Ministry and AsureQuality to use a new business model. This new model means that AsureQuality now facilitates capability rather than providing it directly. This has taken some time to work through.

3.95 The Network has been operating for three years and is still far from its full potential. In that time, the Ministry has merged and restructured into an organisation different to the one that originally conceived the Network, potentially bringing a different workforce model. Also, the Ministry has revised the way that it works with others in biosecurity. These changes mean that the Ministry has less confidence that the original Network concept remains fit for purpose.

Recommendation 6

We recommend that the Ministry for Primary Industries make changes to the Biosecurity Response Services contract and the National Biosecurity Capability Network to reflect its new organisational structure and operating environment.

Capability testing

Simulation and testing was neglected but there are signs of change

3.96 In the past, the Ministry neglected simulation and testing of its overall preparedness and response capabilities. Staff told us that it was reasonable for each team to have two small exercises a year. Between 2005 and 2011, there was one exercise throughout the Ministry about every two years, but some staff recalled little or nothing about these exercises when we asked them. There were no foot and mouth disease simulation exercises between 2005 and 2012. Not enough simulation means a lack of assurance over whether plans and preparations are fit for purpose.

3.97 One of the first decisions the Ministry's new management team took was to hold Exercise Taurus 2012, a foot and mouth disease simulation exercise. Afterwards, 96% of those who answered an evaluation survey thought that the exercise provided good practice in responding to a foot and mouth disease outbreak and 93% of respondents thought that the exercise was a good learning experience. The objective of the exercise was to identify ways to improve. Three ways to improve were identified:

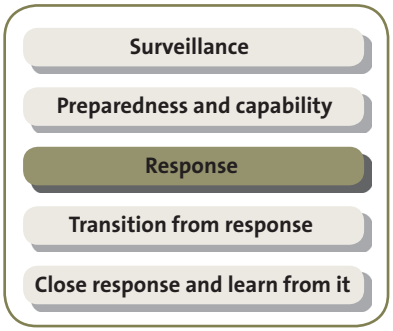
- ensuring that participants are clear about roles and responsibilities – 31% of respondents said they needed to understand roles and responsibilities more clearly;
- having reliable information available for making decisions – 30% of respondents considered that such information was lacking; and
- improving capability and experience – many respondents said that role holders lacked the necessary capability and experience.

3.98 The Ministry recognises that it needs to hold simulations more regularly and is planning to do this. Exercise Taurus 2012 also generated other benefits. It raised staff morale and team spirit after a time of organisational uncertainty. We saw an appetite among many staff for more simulations. This should help to improve performance during responses and begin to build a culture of learning throughout the organisation.

Part 4
Responding to incursions

4.1 In this Part, we set out our findings about how well the Ministry is able to respond to different types of biosecurity incursions. We describe the response system then discuss our views on:

- using the biosecurity response system;
- response partners' views on biosecurity responses; and
- improving the response system.



Summary

4.2 Implemented in 2008, the new biosecurity response system (the response system) improved biosecurity response management. It provides a single approach to all different types and sizes of responses. However, it is not being used to its full potential, and Ministry staff need to better understand the response system.

4.3 During responses, there are many others who work with the Ministry. Most of these response partners told us that they believe they had a high-trust relationship with the Ministry and are supportive of closer working, but think that the Ministry needs stronger response capability.

4.4 The response to kauri dieback is an example of a successful partnership approach to a biosecurity incursion, which could provide a model for relevant future incursions. The Ministry's relationship with iwi and other agencies strengthened during the kauri dieback response and the collaboration between the Ministry and iwi was regarded by all parties as an innovation.

4.5 Measuring performance is essential to ensuring continuous improvement in public services. The Ministry needs better ways of measuring its response performance, especially how effectively and efficiently it responds.

4.6 The Ministry has a good track record of innovating and supporting innovation during biosecurity responses. Most of the examples of responses we looked at included some form of innovation.

The response system

4.7 The Ministry's 2008 response policy describes response as:

> *The actions taken immediately before, during or after a risk organism has been confirmed where management of the risks posed by that organism is considered appropriate. A response may be triggered where the impacts of the risk organism have increased, or new response options become available, that make a response feasible.*

Response can include:

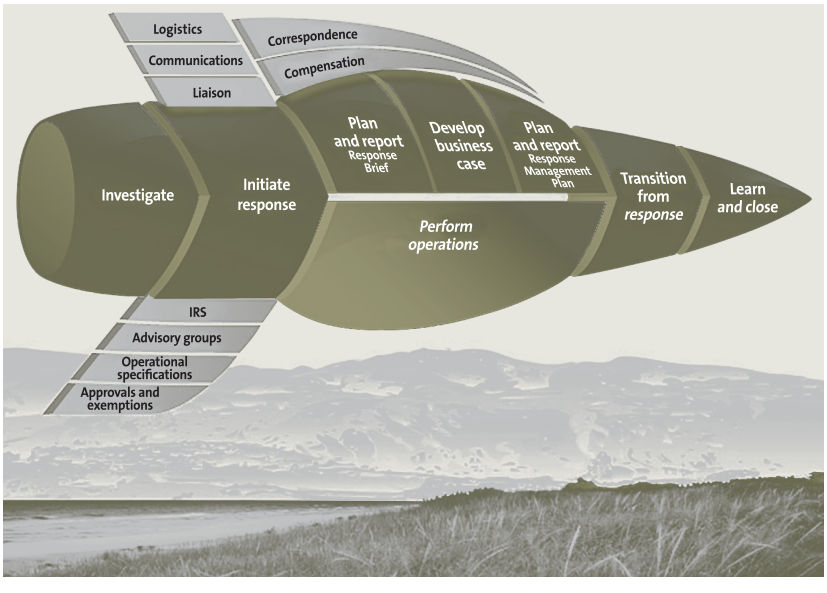
- *investigation of suspect risk organisms;*
- *identification of the organism, containment, and initial assessments of the organism's impacts and response options;*
- *efforts to eradicate a risk organism;*
- *long-term management to mitigate the impacts of an established risk organism, sometimes referred to as "pest management".*

4.8 The Ministry's response system is broadly comparable to the Co-ordinated Incident Management System for multi-agency responses to incidents. This should mean that other agencies could adapt to the biosecurity response system reasonably quickly if needed. The response system's major strength is its flexibility. It is:

- generic – it can be adapted to all types of response;
- versatile – staff learn one response system;
- scalable – it can be adapted to all sizes of response; and
- self-contained and portable – all necessary flowcharts, role and task descriptions, and tools are in the Knowledge Base, which is accessible through the Internet.

4.9 Figure 11 shows the response system's broad phases.

Figure 11
Main phases of the biosecurity response system



Source: Ministry for Primary Industries.

Using the biosecurity response system

4.10 Particular pests and/or diseases, such as foot and mouth disease, would have a particular and significant effect on the economy. However, there are many aspects of a response where it is best to have a generic approach. There is no contradiction between having a generic approach and specific plans for high-impact pests or diseases, where these plans fit within the umbrella of the generic approach.

The biosecurity response system relies on sound judgement

4.11 Implemented in 2008, the response system improved biosecurity response management. It provides a single approach to all different types and sizes of responses. Before this, different systems were used for different response types, such as plant, animal, and marine. The response system is designed to be flexible and scalable. The response system is more efficient because staff no longer have to adapt to different methods in each response. A new response policy was also introduced in 2008. Both the response system and response policy are designed to work closely together. The response system has strengthened how responses are managed.

4.12 The Knowledge Base (see paragraph 3.73) also supports the system's use in responses.

4.13 Using the response system properly depends heavily on staff judgement. The manager of a response needs to scale the response system correctly to the size of the incursion, which is difficult. Managers must choose which parts of the response system and tools are the most appropriate to use in a particular response. If they choose too few, they may not deal effectively with the response. If they choose too many, they will waste resources. Much of this kind of judgement cannot be taught; it can only be achieved through learning from direct experience. Without good judgement, the response system will not be applied as well as it could be.

4.14 Early on, the Ministry recognised that it had to improve its staff's ability to make good judgements. Because of the need for good judgement, the response system was prepared with built-in capability standards covering the principal roles and based on the Lominger competency system. The response system was designed to use an individual's day-to-day work to improve capability. The overall objective was to have a sustainable pool of capable people to lead and manage responses. To support on-the-job learning, a mentoring team provided real-time help to staff working on responses. This gave the Ministry the necessary tools to achieve its objective of a pool of capability.

4.15 The Ministry prepared and successfully introduced the response system and the Knowledge Base but failed to embed it completely. Managers – whose accountability was variable – were responsible for making the response system part of the routine approach to dealing with biosecurity incursions. Applying the capability standards and the response system consistently was reported to be challenging. There are doubts about how well the response system, the capability standards, and the Lominger competency system became routine. We did not find out how many staff completed the capability standards but we were told that few did. The mentoring team has since disbanded and the capability standards are not used. Poor implementation means that the Ministry has struggled to achieve its objective of developing a sustainable pool of capability.

4.16 Poor human resource practice has probably contributed to the lack of success in making the capability standards part of routine work. Our review of the 2010/11 BASS data shows that the Ministry failed to meet two good practice standards for human resources. They were:

- all employees have clear and measurable outcome-based targets set at least once a year; and
- all employees have a formal, recorded performance review, at least once a year, to track personal and professional development.

4.17 Applying basic human resource techniques inconsistently makes it difficult for an organisation to fulfil its objectives.

Staff need more understanding of the response system

4.18 Exercise Taurus 2012 was a good way for the new managers to check how well staff knew the response system and pinpoint any problems. An evaluation survey after the exercise showed that only 39% of respondents thought that the available tools and documents were understood well and used throughout the exercise. However, the same survey showed that 98% of respondents thought that their team was successful.

4.19 We understand from these results that teams consider that they work successfully without using the documents and tools provided, which suggests that staff do not see the need for them. If staff are not familiar with the tools and procedures, there is a risk that they will not use them nor see the need to use them.

Response partners' views on biosecurity responses

Response partners think stronger capability is needed

4.20 Many response partners who have worked with the Ministry during responses consider that its ability to respond to incursions is not as strong as it should be. Figure 12 shows that some expressed concern at what they saw as inexperience among the Ministry staff they met.

Figure 12
Views about the experience, skill, and knowledge of Ministry response staff

Does the Ministry provide response staff with the necessary experience, skill, and knowledge to perform their role?	
Gum leaf skeletoniser	◄►
Didymo	◄►
Southern saltmarsh mosquito	●
Kauri dieback	◄►
Psa	●
Juvenile oyster mortality	●
Key ▲ most comments positive ▼most comments negative	◄►views were mixed overall ● insufficient definitive responses

Note: These views are from response partners for each of the examples we reviewed. See paragraphs 1.23 and 1.26-1.28, and Figure 3.

4.21 Response partners considered that having too few experienced staff stretched the Ministry's ability to respond effectively, mentor and train inexperienced staff, and inspire confidence among others at the same time.

Partners and the Ministry generally have a high-trust relationship

4.22 Most response partners told us that they believe they had a high-trust relationship with the Ministry. Figure 13 summarises how response partners perceived their relationship with the Ministry.

Figure 13
Views about relationships

Does the Ministry develop high-trust relationships with response partners?	
Gum leaf skeletoniser	▲
Didymo	▲
Southern saltmarsh mosquito	▲
Kauri dieback	▲
Psa	▲
Juvenile oyster mortality	●
Key ▲ most comments positive ▼most comments negative ◄►views were mixed overall ● insufficient definitive responses	

Note: These views are from response partners for each of the examples we reviewed. See paragraphs 1.23 and 1.26-1.28, and Figure 3.

4.23 Response partners consider that working together successfully is a good way to build trust. Those who dealt with didymo describe their relationship with the Ministry as one of high trust, attributing much of this to the joint work since the response began in 2004. The Ministry's strong evidence-based approach to eradicating the southern saltmarsh mosquito helped to build trust in the Ministry's methods. These successes put the Ministry in a stronger position to work collaboratively on responses.

4.24 Many response partners see potential in, and support the idea of, a closer working relationship with the Ministry. However, the relationship with response partners needs to be bigger and more long-term than just response work. Some of the organisations we spoke to, such as local authorities, have recently signed up to the Network (see paragraphs 3.89-3.94). If successful, the Network is one way to support closer working, but it does not cover all response partners. Stronger relationships could potentially increase response effectiveness.

Response partners need better induction

4.25 Many response partners reported that, although they took part in a response, they did not understand the response system, how it worked, and what the relative roles and responsibilities were. There was no training or induction to the response system. These views were spread widely throughout the full range of response partners.

4.26 Figure 14 summarises how response partners perceived the Ministry's induction and training for the biosecurity response system.

Figure 14
Views about the provision of induction and training

Does the Ministry provide response partners with induction and training in its biosecurity response model?	
Gum leaf skeletoniser	●
Didymo	◄►
Southern saltmarsh mosquito	▼
Kauri dieback	▼
Psa	▼
Juvenile oyster mortality	●
Key ▲ most comments positive ▼most comments negative ◄►views were mixed overall ● insufficient definitive responses	

Note: These views are from response partners for each of the examples we reviewed. See paragraphs 1.23 and 1.26-1.28, and Figure 3.

4.27 Without induction, response partners will not understand their role and the context of the whole response. There are isolated examples of response partners being familiar with the response system. However, this tends to be a secondary benefit of other work, rather than a result of a response induction. For example, partners responding to didymo are familiar with the response system because they were consulted when it was being devised.

Example of a successful partnership for working on responses

4.28 The response to kauri dieback is an example of a successful partnership approach to a biosecurity incursion and could provide a model for relevant future incursions. The collaboration between the Ministry and iwi was regarded by all parties we spoke to as an innovation. The Ministry's relationship with iwi and other agencies strengthened significantly during the response.

4.29 Kauri dieback is a microscopic fungus-like organism that affects only kauri and kills trees and seedlings of all ages. In October 2008, the Ministry started a collaborative response. This joint-agency "one-team" approach included the Department of Conservation, Auckland Regional Council, Northland Regional Council, Environment Waikato, and Bay of Plenty Regional Council. In October 2009, the response ended and the Government funded long-term management until 2014.

4.30 At first, the Ministry was slow to include Māori in the response to kauri dieback. Since 2009, the Ministry has concentrated on having an open and honest relationship. Iwi told us that they saw Ministry staff prepared to step in and work

with all parties to sort out misunderstandings. For example, early in the response to kauri dieback, the Ministry recognised that Māori representatives should be compensated for their work and the time they spent preparing. This helped to create a stronger relationship with iwi.

4.31 Māori are full response partners. The kauri dieback response was the first time that the new response system had been used jointly with other agencies. Many matters had to be worked through, which, in turn, brought learning. Having agreed that there would have to be further innovations to ensure that iwi were response partners rather than stakeholders, the Ministry and iwi:

- formed the Tāngata Whenua Roopū reference group, which allows Māori viewpoints to be included in the response to kauri dieback – representing all Māori views is difficult, but this is a major innovation; and
- agreed to have iwi representatives in the most important of the kauri dieback response working groups – including having two iwi members on the Technical Advisory Group.

4.32 We consider that the response to kauri dieback has provided the Ministry with valuable experience of working in partnership and of dealing with culturally significant biosecurity incursions. If the learning from this is embedded, the Ministry should be well placed for similar responses.

Improving the response system

Measurement of response performance needs to be better

4.33 Measuring performance is essential in ensuring continuous improvement in public services. Clarifying outputs and outcomes achieved for the resources expended makes it easier to hold organisations, work groups, and people accountable. Performance measures should follow from a statement of the organisation's objectives.

4.34 The Ministry has a standalone IT system to track responses and this provides some basic information. This gives a broad indication of the number of responses at any one time, how long a response has been in operation, and what stage it is at. This is helpful for monitoring overall progress. However, we found no evidence of more robust performance measures that would show the effectiveness or efficiency of biosecurity responses.

4.35 At the start of each response, the Ministry sets out broad target outcomes. Our case studies showed that, in general, the Ministry achieved its broad target outcomes. To test the processes in place, we reviewed a further random sample

of 23 responses between 2010/11 and 2011/12. Nearly all the main process documentation was present, but their completeness was variable.

4.36 Although the Ministry generally achieves its target outcomes, without systematic performance measurement the Ministry cannot show whether it could achieve its objectives in a more effective and efficient way.

Recommendation 7

We recommend that the Ministry for Primary Industries prepare a suite of performance measures to:

- include operational activity, effectiveness and efficiency of response, and individual staff performance;
- inform continuous improvements to the effectiveness and efficiency of its preparedness and response activities; and
- report publicly on its effectiveness and efficiency.

Risks of inconsistent decision-making

4.37 Biosecurity's origins are in protecting primary production, vital to New Zealand's economic welfare. The 2003 biosecurity strategy highlighted that biosecurity includes protecting flora and fauna, human health, and parts of our lifestyle and national identity. Figure 15 shows how the biosecurity system should assess how much we are prepared to pay to protect these assets, using the four values framework.

Figure 15
Four values framework for assessing the effect of a biosecurity incursion

The 2003 biosecurity strategy rejected the notion of a hierarchy of values. The economy, biodiversity, and society are interdependent, so deserve equal and consistent treatment in biosecurity decision-making.

The four values framework was created to help assess the effect of biosecurity incursions on:

- the economy – primary production, industry, tourism, and service sectors;
- the environment – protecting indigenous and valued introduced species, biodiversity, ecosystems, and landscapes;
- health – human health and well-being; and
- socio-cultural values – safeguarding lifestyle, historical values, and Māori cultural and spiritual values.

Source: Biosecurity Council (August 2003), *Tiakina Aotearoa Protect New Zealand: The Biosecurity Strategy for New Zealand*, Wellington.

4.38 Failure to make decisions based on a balanced and equal view of the four values can lead to inconsistent response decisions. In 2010, the great white cabbage butterfly was found in New Zealand. Overseas, this insect is a significant pest of brassica crops, such as cabbage. The butterfly could potentially affect the country's brassica industry and home gardeners and may be a significant threat to some critically endangered native brassica.

4.39 When the Ministry first assessed the risk from the great white cabbage butterfly, it considered only the risk to the economy. In November 2011, after the Ministry found that the butterfly had become established, the response team was directed to stand down. However, the Department of Conservation expressed concern at this decision, saying that the Ministry had not fully considered the butterfly's potential effects on endangered native brassica. In late 2012, the Ministry agreed a partnership with the Department to continue the response with a shared funding approach and the Department as lead agency for this response.

4.40 Inconsistent response decisions like these can confuse and frustrate staff and response partners. The Ministry's staff and response partners are strongly motivated, have a sense of mission, and believe that their work is worthwhile. If motivation is eroded, that is a risk to effective response activity.

There is a good track record of innovation during responses

4.41 The Ministry has a good track record of innovating and supporting innovation during biosecurity responses. Figure 16 summarises how response partners viewed the Ministry's attempts to innovate during responses.

Figure 16
Views about innovation by the Ministry

Does the Ministry add long-term value to biosecurity response work through innovation and creative thinking?	
Gum leaf skeletoniser	▲
Didymo	▲
Southern saltmarsh mosquito	▲
Kauri dieback	▲
Psa	▲
Juvenile oyster mortality	▲
Key ▲ most comments positive ▼most comments negative ◄►views were mixed overall ● insufficient definitive responses	

Note: These views are from response partners for each of the examples we reviewed. See paragraphs 1.23 and 1.26-1.28, and Figure 3.

4.42 We found some innovative practice and response partners reported that:

- Early ways of detecting kauri dieback were inaccurate so the response team worked out new ways to detect kauri dieback in soil. In doing so, the team detected many new organisms and the new methods could potentially be used in other incursions.
- The Psa incursion and response helped Plant and Food Research (a CRI and one of the Ministry's response partners) to understand genomics better. This led to new tools for diagnosing Psa, which should lead to better detection.
- The Ministry and Landcare Research prepared a joint operational protocol, which overcame problems in sampling kauri dieback that had introduced a contamination risk. This should improve the chances of successfully detecting kauri dieback.

4.43 To respond to the didymo incursion, the Ministry set up a research facility at Waiau River for use by the National Institute of Water and Atmospheric Research, allowing it to test how didymo grows and affects the environment under various conditions. This provided important information about the way didymo behaves. The Ministry has now included other freshwater pests in the long-term management of didymo, which is logical and efficient. The Ministry's willingness and ability to foster innovation should help it to prepare better for biosecurity incursions.

4.44 Responding to the southern saltmarsh mosquito incursion increased knowledge about this pest, including providing significant information about how the insect lives and reproduces. The Ministry experimented with various treatments, alone and in combination, to attack mosquito larvae as well as adults, to see which was the most effective.

4.45 Eradicating the southern saltmarsh mosquito was difficult. For example, the insects are tenacious and can breed in a depression the size of a horse's hoof print. A strong Technical Advisory Group[14] provided advice and included members from countries where the southern saltmarsh mosquito is prevalent. The Ministry thought carefully about how to destroy the last eggs and larvae. For example, artificial flooding forced the breeding cycle. This shows that the Ministry can take on difficult technical challenges when it has to.

4.46 The Ministry and the Ministry of Health have jointly commissioned a book about eradicating southern saltmarsh mosquito, to be published around July 2013, so that the global scientific community can benefit from the information gained during the response.

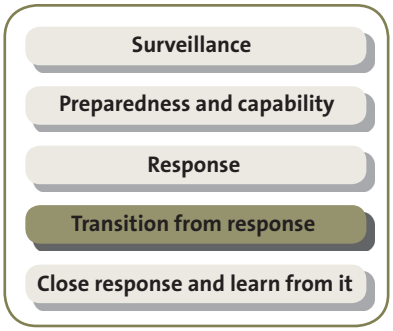
14 During a response, the Ministry routinely draws on external expertise and advice, including the use of Technical Advisory Groups made up of known experts in the particular organism.

4.47 The Ministry has shown that it can listen and respond. At the time of the Psa and juvenile oyster mortality responses, Government support did not include compensation to those affected by biosecurity incursions. In view of response partners' concerns, the Ministry proposed amending the Adverse Climatic Events Contingency Appropriation, which at that time covered only events such as floods and droughts. In June 2012, the Government announced new recovery support for commercial farmers and growers seriously affected by biosecurity incursions. The new Primary Sector Recovery Policy covers agriculture, horticulture, forestry, and aquaculture producers.

Part 5
Transition from response

5.1 In this Part, we set out our findings about how the Ministry transitions out of responses and, where appropriate, how effective it is at transferring knowledge to response partners. We discuss:

- sharing knowledge with others; and
- transitioning out of response.



Summary

5.2 Response partners think that the Ministry is good at sharing knowledge with them and that this sharing of knowledge improves biosecurity. It shares knowledge in several ways, including the use of web-based tools as knowledge portals but also provides direct support in person and by telephone.

5.3 In the examples we looked at, the Ministry has sometimes struggled to transition out of response in an organised and co-ordinated way. Poor communication can lead to abrupt transitions, with partners unaware and without sufficient preparation. However, when it plans carefully, the Ministry has shown that it is capable of transitioning seamlessly, as it did with didymo.

5.4 Transition out of response can sometimes lead to long-term management of the particular organism. Long-term management can bring its own problems, such as dealing with the complexity of a national pest management strategy, as with Psa, or obtaining long-term sustainable funding, as with the gum leaf skeletoniser.

Sharing knowledge with others

5.5 Response partners told us that the Ministry was good at transferring knowledge to others and that this is a good way of improving biosecurity. Figure 17 summarises how response partners viewed the Ministry's attempts to transfer knowledge to them.

Figure 17
Views about the Ministry's transfer of knowledge

Does the Ministry effectively transfer knowledge to response partners?	
Gum leaf skeletoniser	▲
Didymo	▲
Southern saltmarsh mosquito	▲
Kauri dieback	◄►
Psa	◄►
Juvenile oyster mortality	●
Key ▲ most comments positive ▼most comments negative ◄►views were mixed overall ● insufficient definitive responses	

Note: These views are from response partners for each of the examples we reviewed. See paragraphs 1.23 and 1.26-1.28, and Figure 3.

5.6 The Ministry has found ways to assist knowledge transfer. Little was known about didymo before the outbreak. As part of long-term management, the Ministry created a website, didymo.net. This brought together reports, other documents, and other resources for response partners to access and share. Didymo.net also provides a discussion forum. Regular teleconferences help people to share knowledge and provide opportunities to ask questions. This ensures that those interested in combating didymo, who are widely geographically dispersed, have the latest information.

5.7 The Ministry is capable of promoting best practice in biosecurity. During the juvenile oyster mortality response, the Ministry advised the Cawthron Institute[15] about best biosecurity practice and commented on the Cawthron Institute's development proposals The Cawthron Institute told us that the Ministry provided expert technical advice and constructive criticism and that it now has a positive ongoing relationship with the Ministry.

Transitioning out of response

5.8 Response partners consider that, in general, the Ministry has not managed the transition out of response well. The response policy considers standing down a response when various criteria are met. These criteria include:

- response objectives have been met, such as when the pest or disease is eradicated;
- there is no feasible response option;

15 The Cawthron Institute is an independent research centre, based in Nelson and Marlborough. It provides research, advice, and analytical services to support the seafood industry and sustainable management of the coast and freshwater and to protect New Zealand from pests and diseases. See the Cawthron Institute's website, www.cawthron.org.nz.

- the response no longer provides significant public benefit and/or the response costs outweigh the benefits; and
- another identified group can manage the risks from the organism without further Ministry intervention.

5.9 Figure 18 summarises response partners' perceptions of how the Ministry supported response partners in transitioning from response.

Figure 18
Views about how well the Ministry moves out of the response phase

Does the Ministry support response partners into long-term management effectively and efficiently?	
Gum leaf skeletoniser	◄►
Didymo	▲
Southern saltmarsh mosquito	●
Kauri dieback	▼
Psa	▼
Juvenile oyster mortality	●
Key ▲ most comments positive ▼most comments negative ◄►views were mixed overall ● insufficient definitive responses	

Note: These views are from response partners for each of the examples we reviewed. See paragraphs 1.23 and 1.26-1.28, and Figure 3.

5.10 Communicating better with response partners would improve how the Ministry manages transitions. Response partners reported that, during a transition period, communications with the Ministry sometimes entered a "vacuum", which response partners found unacceptable.

5.11 We also found that the Ministry consistently failed to signal clearly that it was transitioning out of response and the implications of that. This often left response partners without sufficient time to prepare. Those working on the response to kauri dieback did not find out that the Ministry was transitioning from the response phase for weeks. Some response partners did not know why the transition took place. Not communicating can make work less effective and lead to others becoming less confident in the Ministry's response to an incursion.

5.12 During a transition, the abrupt loss of response staff and other resources can cause problems:

- The kauri dieback response team quickly broke up and returned to other work, even though long-term management arrangements had not been set up. This meant that no handover was possible between response staff and long-

term managers. Ministry response staff then disappeared, with no further contact with the response partners they had been working with. This reduced momentum and continuity and delayed work.

- During the Psa response, Ministry staff and other support became available quickly. However, during the transition to long-term management, these resources were withdrawn too quickly, albeit at the request of industry. This led to a large squeeze on resources, which delayed decisions and contains lessons for the proposed move to greater industry involvement through the GIA.

5.13 The response to didymo has moved on successfully to long-term management. Critical to success was deciding not to close the response until the long-term management operation was up and running. This took more than a year. The partnership became the combined responsibility of the Ministry, the Department of Conservation, Fish and Game, regional councils, iwi, and industry. A defined structure was put in place that included a steering group, regional groups, and co-ordinating roles. The partnership's remit has now been expanded to include working to combat other freshwater pests. This shows that the Ministry has the processes and capability, when properly deployed, to successfully transition from response.

5.14 Sometimes, long-term management will require the preparation of a national pest management strategy (NPMS). This can be a complex, difficult, and long process because there are many steps, including public consultation. In the last 14 years, only three NPMSs have been prepared. An NPMS forms part of the objectives of Kiwifruit Vine Health (KVH), an independent organisation leading the kiwifruit industry response to the Psa incursion.[16] KVH's experience shows that this is difficult and sometimes convoluted.

5.15 The Psa NPMS is still being prepared almost two years after the initial incursion. We consider that the NPMS may have been a significant barrier to those responsible for long-term management and could potentially deter others from working collaboratively. The Biosecurity Law Reform Act 2012 has simplified the process for preparing an NPMS, but it is too early to see any results from this.

5.16 The difficulty of getting funding for long-term management of pests or diseases could deter response partners from playing a role. Long-term management can depend on contestable funding (usually for projects), which is relatively short-term. Therefore, response partners might worry about whether there will be sustainable funding for these projects.

5.17 The response to gum leaf skeletoniser prompted work on using an Australian predator wasp as a control. There was early biosecurity funding of the wasp

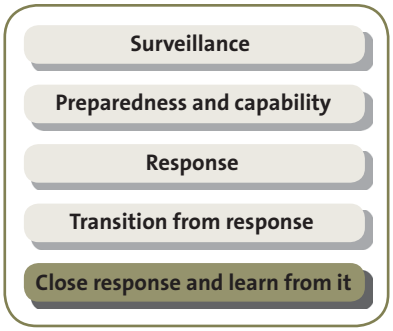
16 Kiwifruit Vine Health was set up after the Industry Advisory Council agreed to transition management of the Psa response from the Ministry and Zespri to a separate entity.

project and response partners reported that the Ministry's input was good. However, after transitioning from response, the wasp project relied on contestable funds (for example, the Sustainable Farming Fund) and response partners considered Ministry input into this phase was weak. In August 2004, research into the predator wasp began. The project has been successful so far, but it is still ongoing after eight years, which is not untypical with the nature of these projects. Ending Sustainable Farming Fund support part-way through the wasp project would have been disastrous.

5.18 The GIA should change this because it is designed to influence funding choices towards those matters that are of most concern to the industry involved. However, not all industries will take part in the GIA, and other non-industry response partners, such as iwi, will also not take part. Barriers like these could deter such groups from being part of these projects and may reduce their trust in the Government as a reliable partner.

Part 6
Closing responses and learning from them

6.1 In this Part, we set out our findings about how the Ministry closes a response down and how it goes about capturing learning from it.



Summary

6.2 Introducing the new response system provided the Ministry with a way to capture learning and to identify improvements at the end of a response. However, a lack of accountability, priority setting, and staff continuity has meant that much of the staff time and money invested was wasted, because it did not lead to significant improvement. This led some staff to become sceptical about managers' attitudes to change.

6.3 A different approach is now in place. A new process means that the Senior Leadership Team is required to respond to audits and other reviews, which should increase accountability. There is some evidence of a more open approach to acknowledging mistakes and treating these as learning opportunities. Some staff believe that these changes signal the advent of a learning organisation.

Missed opportunities for continuous improvement

6.4 The Ministry's response system aims to:

- record learning from responses;
- formally review the response system's performance, policies, and procedures; and
- update the response system and plans.

6.5 Before introducing the response system, the Ministry had no formal way to record learning from each response. Most learning that took place during the response to gum leaf skeletoniser, which predated the response system, took place individually. This learning added to a staff member's skill base, but led to inconsistent learning for future responses and a loss of knowledge if the staff member left their job.

6.6 Introducing the response system was an investment in the right tools and methods to learn and continuously improve. Unfortunately, these tools have not been used to their full potential. Many previous lessons-learned exercises did not lead to significant change. Evidence shows that many recommendations from the 2005 foot and mouth disease simulation were not put into effect fully. We reviewed the turnover of the Knowledge Base content to see whether this had been updated. We found some revisions but fewer than we expected. Having the right tools and methods is of little value if they are not used and refined.

6.7 We reviewed the lessons-learned exercises from the responses to kauri dieback (July 2009), Psa (October 2011), and Exercise Taurus 2012 (May 2012). These highlighted many similar failings, including:

- staff being unfamiliar with the response system;
- the Response Strategic Leadership not working as well as it should; and
- poor management of the tension between BAU and response work.

6.8 Feedback from Exercise Taurus 2012 showed that, at first, many staff questioned the value of the exercise. Staff stated that, in the past, managers had not championed and required change and had failed to learn from earlier simulations, exercises, and responses. This lack of learning means the Ministry missed earlier opportunities to improve and repeated similar mistakes, which negatively affected staff attitudes.

Earlier difficulties in making improvements

6.9 The response policy dictates that an evaluation or lessons-learned exercise at the end of a response should record any learning and feed this into improvements. We consider that the processes for identifying organisational learning have been ineffective because of a lack of:

- accountability – there was no robust method within the biosecurity system nor performance management to translate what was learned into improved systems;
- prioritising – the Ministry failed to fully acknowledge the effect of response work on BAU, so had unrealistic expectations of what it could do; and
- continuity – changes to staff and management structures reduced staff continuity, which often meant that work was not finished.

6.10 Failing to implement identified improvements wastes the investment made in the process. For large responses, identifying the lessons learned can be expensive. In the Psa response, the budgeted cost of the lessons-learned debrief sessions was $39,000, which is value for money only if the Ministry works better as a result. Otherwise, it is wasted.

6.11 The Ministry's internal audit team told us that many of its earlier recommendations were not addressed because of work pressure during responses and a lack of accountability.

Introducing more positive management behaviours

6.12 The Ministry reports that, in June 2012, it began to respond to audits and other reviews in a new way, requiring the Senior Leadership Team to agree to an action plan. Strengthening its approach to in-house advice provides opportunities for change and recognises the value in such reviews, including the work of the internal audit team.

6.13 Staff told us that changes in managers' behaviour showed an open approach to learning lessons, such as in the 2012 review of how kits containing strawberry seeds and coco peat were wrongly cleared for sale in New Zealand.[17] Staff believe that it is a good example of where mistakes have led to a positive outcome and that it signals the advent of a learning organisation.

6.14 The overall action plan to manage preparedness, containing the recommendations from Exercise Taurus 2012 and other responses, shows a changed approach. The Ministry says that, every three months, it tracks progress in addressing these recommendations.

6.15 If staff see signs of organisational culture changing, they are more likely to change their own behaviour. This should put the Ministry in a better position for the future.

17 In 2011, thousands of kits containing strawberry seeds and coco peat were wrongly given biosecurity clearance and went on sale nationwide. The product was later recalled and the Ministry of Agriculture and Forestry tested a sample of the seeds.

Appendix 1
The Government Industry Agreement on Biosecurity Readiness and Response

The Government Industry Agreement on Biosecurity Readiness and Response (GIA) is one of the main parts of the Government's work to improve biosecurity preparedness and strengthen partnerships with industry. It will allow primary industries and the Government to begin joint decision-making and cost-sharing for biosecurity preparedness and response work.

The GIA's objective is more effective and efficient biosecurity by ensuring that primary industries have a greater say and contribute more. It should allow primary industries and the Government to work closely together to make informed decisions about biosecurity preparedness and response work. When it comes to sharing costs and financial contributions, it will also allow the Government and primary industries to consider the balance between what is a public good and what is a private good.

Anticipated outcomes of the GIA include:

- more input from industry into the biosecurity work that directly affects them;
- better prioritising of resources; and
- being better prepared, meaning fewer incursions and more certainty for all parties.

A joint Ministry and primary industries working group produced a GIA draft deed of agreement at the end of 2012. After Cabinet approves the GIA deed of agreement, it will be signed by those primary industry bodies that wish to participate. This will commit signatory parties to the terms of the GIA. Primary producers' opinions on the GIA vary, with some sectors believing the focus is too narrow because it is confined to only one component of the Biosecurity Act. By November 2012, 16 industry bodies had signed a preliminary Memorandum of Understanding. It is planned that the GIA will formally come into effect on 1 July 2013.

Appendix 2
Animal Health Laboratory preparations – strengths and weaknesses

The following table sets out the strengths and weaknesses in how the Animal Health Laboratory prepares for a foot and mouth disease outbreak

Strengths	Weaknesses
Laboratory plan	
The laboratory has a plan to respond to a foot and mouth disease outbreak.	The plan is incomplete.
The plan has considered the likely scientific work required in an outbreak, including: • laboratory processes; • testing processes; and • defining team roles. The laboratory plan estimates that a medium to large response would require a two-shift rota, with 50-70 more staff a shift. The Ministry's Quality, Services and Support (QSS) team is on the same site as the laboratory.	The laboratory plan does not detail or show how it will deal with: • getting extra staff; • accommodating extra staff; • training extra staff; • equipping extra staff; • logistics and staff support – it assumes the QSS team would handle logistics but this is not agreed; • ensuring that there are enough supplies for the laboratory; • the need for extra data processing, hardware and software requirements, licences, telephone/Internet connections, and IT technical support; or • sharing or transferring work and information between different laboratories if needed.
	The plan assumes, without supporting evidence, that the Ministry would provide the necessary funding to get the staff, equipment, and supplies to run the laboratory during an outbreak.
Staffing and capability	
During the last two years, the Ministry sent two scientists to work at the World Reference Laboratory for Foot-and-Mouth Disease in the United Kingdom. New scientific testing methods allow laboratory staff to maintain some aspects of capability better.	The laboratory does not hold or want to hold any samples of the virus. Maintaining capability without any active hands-on work is challenging.
There is some cross-training of laboratory staff on methods to diagnose foot and mouth disease to improve flexibility.	

Strengths	Weaknesses
The Ministry, Crown research institutes, and private organisations have a veterinary diagnostic laboratory network. Members meet once a year and exchange emails during the year. The network: • fosters biosafety; • improves communications and knowledge transfer; • discusses professional, national, and international standards; and • supports animal disease emergency events.	The veterinary network is informal, in its early days, and focused on talking. It has no documented plans.
A formal arrangement for providing laboratory staff from the National Centre for Biosecurity and Infectious Diseases has been used for smaller responses.	There is no evidence that this arrangement would supply enough extra staff.
Information systems	
The Ministry is working to improve the Laboratory Information Management System (LIMS) to allow it to interact with the Ministry's other IT systems.	LIMS does not interact with the Ministry's other systems. The laboratory is unable to transfer information to other laboratories outside the Ministry.
Simulation and testing	
Three staff took part in the Exercise Taurus 2012 simulation exercise.	There has been no laboratory-based simulation of an outbreak.
Capacity	
The laboratory estimates that, during the first two phases of an outbreak (investigation and response), it could process 35 premises with clinical signs of the disease (or 14 premises without clinical signs) each week.	Likely estimates of demand in an outbreak show: • between 10 and 80 farms a week (large outbreak); and • between 50 and 70 farms a week (medium outbreak).
The laboratory considers that it can meet the likely demand forecast in the standard scenario (3000 serum samples a day at first, possibly rising to 6000) after the response, to demonstrate proof of freedom from the disease.	The standard scenario may underestimate the probable size of an outbreak.

Source: Ministry for Primary Industries.

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