2

Case Study 2

Response to the Incursion of the Southern Saltmarsh Mosquito

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Photo Acknowledgement:
Larvae photo on previous page - Stephen Doggett, University of Sydney.

Why Did We Select This Case Study?

2.1 The southern saltmarsh mosquito *(Ochlerotatus camptorhynchus)* is a carrier of Ross River virus. Because of the threat this virus poses to the public's health, the responsibility for managing the response to this pest rests with the Ministry of Health (MoH). This pest incursion therefore gave us the opportunity to establish whether there are issues from having more than one department with biosecurity responsibilities, and to review how another department has managed an incursion compared to MAF's approach.

2.2 Another reason for selecting this case study was to look at the process by which funding is obtained for incursion responses to identify whether improvements could be made to the way in which funds are allocated to the departments responsible for managing incursion responses.

Key Findings

2.3 ***Uncertainty and delays in applying for resource consent to spray mosquito control agents have led to delays in spraying which could have compromised the incursion response against the southern saltmarsh mosquito, particularly in Kaipara. Lessons were not learned from the initial Napier outbreak that had been well managed. This experience illustrates the tensions that exist between the need to act quickly against a pest, and the legitimate expectations of communities that they will be consulted. (See paragraphs 2.52-2.66 on pages 43-46.)***

2.4 ***Eradication in Kaipara was initially not considered feasible, but new information reopened the possibility of this approach. However, MoH continued to try to collect better information, as initially agreed, and did not approach the Technical Advisory Group or the Treasury to explore whether a decision for long-term action against the mosquito in Kaipara might be expedited. More open communications, and an agreed understanding of the circumstances for revisiting the initial decision, would have enabled the issues to be considered sooner. (See paragraphs 2.67-2.77 on pages 46-48.)***

2.5 ***MoH is unable to reprioritise expenditure from its small biosecurity funding to pay for an incursion response. The process to prepare a response recommendation and seek funding is complex – the analysis required is inevitably resource-intensive and time-consuming. There was uncertainty***

and some disagreement over whether the response should be treated as a biosecurity issue or a health issue. (See paragraphs 2.78-2.89 on pages 48-50.)

2.6 *Process failures within the national surveillance programme led to delays in the mosquito being identified in Gisborne. A review of the programme identified many deficiencies, including some that arose from insufficient resourcing of surveillance. (See paragraphs 2.31-2.43 on pages 37-39, and paragraphs 2.90-2.92 on page 50.)*

2.7 *MoH has gained experience and expertise in dealing with mosquito incursions since December 1998 – including difficulties that arose with having a new lead agency at each site. It has contracted a dedicated, experienced team to manage the ongoing response. Now that Cabinet has approved long-term funding, there is scope for contracts of longer than one year that would help increase staff stability and allow for more forward planning. (See paragraphs 2.93-2.112 on pages 51-54.)*

Recommendations

2.8 *MoH should ensure that for future incursion responses it is clear which agency is responsible for obtaining resource consents. (See paragraphs 2.48-2.66 on pages 42-46.)*

2.9 *The Treasury and MoH should agree a common process for the actions required to prepare recommendations for long-term funding of an incursion response. This process should include clear timelines, be documented, pre-agreed and well communicated. Once this process is agreed, the Treasury and MoH should ensure they have a clear, shared understanding about what procedure will be followed should any of the key assumptions or risks subsequently change. (See paragraphs 2.67-2.77 on pages 46-48.)*

2.10 *All incursion responses – including incursion responses such as the southern saltmarsh mosquito – should be prioritised on a consistent basis irrespective of which department is managing the response to the incursion and the main sector under threat. For example, the case for a response to the southern saltmarsh mosquito should cover the health, economic and social impacts of the pest, and make comparisons with other health and biosecurity priorities. (See paragraphs 2.85-2.89 on pages 49-50.)*

2.11 *MoH should consider tendering contracts for longer than one year. (See paragraphs 2.108-2.110 on pages 53-54.)*

Introduction

2.12 In late-December 1998 the southern saltmarsh mosquito (SSM) was detected in Napier. This mosquito can transmit Ross River virus (RRV) to humans, and therefore poses a threat to public health.

2.13 MoH is responsible for managing biosecurity risks to people's health and has taken the lead in managing the response to the SSM.

How Did the Southern Saltmarsh Mosquito Enter New Zealand?

2.14 The pathway of entry for the mosquito is not known. MoH has gathered information on possible entry pathways, but has not reached a conclusion on the most likely pathway. Possibilities include wind-blown arrival, transport on canvas-topped sea containers, in air containers, ships, yachts, imported cars and machinery, or aeroplanes that are not sprayed for insects. MoH also does not know how the mosquito spread throughout the country, or whether each new site was a separate incursion.

2.15 MoH believes the mosquito was present in Napier for up to two years before members of the public reported an increase in the numbers of vicious biting mosquitoes to the Napier City Council.

2.16 The mosquito has since been detected in the places shown in Figure 2.1 on the next page.

Figure 2.1
Incursions of the Southern Saltmarsh Mosquito
(as at August 2002)

What Risk Does the Southern Saltmarsh Mosquito Pose to New Zealand?

2.17 The mosquito is established throughout Australia, Papua New Guinea, the Solomon Islands and some other Pacific islands. With the high levels of tourism between New Zealand and these areas, MoH believes it will be only a matter of time before a mosquito transmits RRV from an infected tourist or returning traveller to others in the community.

2.18 The New Zealand population is non-immune to RRV because of no previous exposure to it, and is therefore susceptible to the disease. The cost to the economy of an outbreak in Auckland, Kaipara and Christchurch has been calculated at $35.3 million over 10 years.

Figure 2.2
Ross River Virus

RRV can cause aching muscles and joints, fever, chills, headache and tiredness. Symptoms generally last up to a month but can persist for a number of years in some people. The virus can cause depression in about 10% of people who catch it. There is no vaccine for RRV and treatment is aimed at relieving symptoms.

The only way people can catch RRV is by being bitten by a mosquito that is carrying the virus. The virus cannot spread directly from person to person.

2.19 Although disease transmission is the most commonly cited reason for not wanting the mosquitoes to become established in New Zealand, there are other issues to be considered:

- the presence of large numbers of vicious biting pests (that also bite during the day) causes disruption to outdoor activities and has a high nuisance value;
- property values on land adjacent to areas where mosquitoes are present could be reduced;
- there could be a negative impact on New Zealand's $3,200 million a year tourism industry;
- there would be costs for modifying buildings to restrict mosquito entry;

- local government regional mosquito control programmes would need to be implemented and funded;
- low-income families might be especially disadvantaged, as they have less disposable income to offset the effects of the mosquito (such as to install mosquito screens); and
- saltmarsh habitat is often in areas of traditional shellfish gathering for Maori.

How Has MoH Responded to the Southern Saltmarsh Mosquito Incursion?

2.20 The response to the mosquito began in Napier in December 1998, and is ongoing. Actions that MoH has taken include:

- funding the mosquito response centre;
- establishing a Technical Advisory Group;
- preparing health risk assessments;
- commissioning cost-benefit analyses; and
- implementing surveillance for salt water breeding mosquitoes.

Funding the Mosquito Response Centre

2.21 Almost immediately after detection of the SSM in Napier, the public health unit of Hawkes Bay HealthCare, with funding from the then Health Funding Authority, set up a mosquito response centre. The response centre organised:

- **a delimiting survey –** to determine the extent of the incursion;
- **habitat survey and mapping –** to determine the location and amount of potential habitat throughout the country;
- **mosquito and larval trapping –** to test for the presence of mosquito adults and larvae;
- **control –** initially with *Bti,* and later with S-methoprene;
- **habitat elimination and modification –** such as filling drains and depressions that mosquitoes could use for breeding, and clearing vegetation from drains to ensure penetration of control agents; and
- **community and stakeholder group liaison**.

2.22 Public health staff from around the country joined the Napier response to provide additional assistance. Their involvement was also intended to help them to subsequently carry out surveillance in their own regions, and some found this very useful – though others felt that the experience they were able to gain from carrying out field work under direction was limited.

2.23 Staff from this response centre, along with staff from Southern Monitoring Services Limited, were later involved in the Gisborne response. People from the Hawkes Bay HealthCare public health unit, in conjunction with Southern Monitoring Services, have since gone on to form New Zealand BioSecure, a company that currently holds the MoH contract for the National Exotic Mosquito Response Centre (discussed in more detail in paragraphs 2.100-2.112 on pages 52-54).

Figure 2.3
Control Agents Used Against the Southern Saltmarsh Mosquito

Bti (Bacillus thuringiensis israelensis)

Bti is an organic biological spray used to control mosquitoes in a natural, environmentally friendly manner. It has undergone a full health impact assessment and has been shown to have no impact on people or the environment. *Bti* is applied to water infested with larvae, and can be spread by ground or aerial spraying. The Technical Advisory Group (paragraphs 2.24-2.28) noted early in the response to the incursion that *Bti* may be effective for containment but other treatments are likely to be needed to eradicate the mosquito.

S-methoprene

S-methoprene stops the mosquito pupae hatching (it is ineffective against adult mosquitoes). It has been used extensively overseas to control mosquitoes and has been used in New Zealand in conjunction with *Bti* in the southern saltmarsh mosquito eradication programme. Compared with *Bti*, which breaks down very quickly when it is applied, S-methoprene can be applied in a slow-release form, and can be effective for 21 days or longer in water. However, it is a much more expensive product than *Bti*. S-methoprene has a low toxicity, and poses little hazard to other insect species or humans.

Establishing a Technical Advisory Group

2.24 MoH's Technical Advisory Group (TAG) first met in January 1999. Its members include Australian and New Zealand mosquito experts and public health specialists. MoH organised the southern saltmarsh mosquito TAG well, and the group has had:

- a clear role and function – to provide independent scientific and technical advice to MoH in its response to the SSM;
- Terms of Reference and a Conflict of Interest Declaration from the first meeting; and
- meetings minuted throughout the response.

2.25 The TAG has provided advice that has formed a response plan for each incursion. It has also been careful to keep information about costs separate from technical and scientific advice to the Minister.

2.26 The clear role, good organisation and high standard of documentation of this TAG is in contrast to the painted apple moth TAG (see Case Study 3 on pages 57-76).

2.27 A number of changes to how the response is being run have occurred since the TAG was first convened, particularly in the use of a contractor (New Zealand BioSecure) to manage the operational activities of the response (see paragraphs 2.100-2.112 on pages 52-54). With these changes in mind it would be useful for MoH to renew the Conflict of Interest Declarations of TAG members.

2.28 At present the TAG is chaired by the Chief Technical Officer – Health, who is also closely involved with the operational activities of the response. To further support the independence of the TAG, MoH might consider having an independent person to chair the TAG.

Preparing Health Risk Assessments

2.29 A health risk assessment has been prepared for each region as the SSM was detected. The health risk assessments are used to:

- provide information on the public health risk posed by the SSM; and
- assist with decisions on long-term responses.

Commissioning Cost-benefit Analyses

2.30 MoH has commissioned a cost-benefit analysis for each SSM incursion response that:

- takes into account the estimated costs of RRV, compared to mosquito spraying costs; and
- provides information to MoH and the Treasury to determine whether funding for a response is justified.

Implementing Surveillance for Salt Water Breeding Mosquitoes

A review of the national surveillance programme identified many deficiencies, including some that arose from insufficient resourcing of surveillance.

2.31 When the SSM was detected in Napier there had been no active surveillance for salt water breeding mosquitoes in New Zealand. An Australian expert visited New Zealand in 1997 and determined that there was little risk posed by these mosquitoes, although he indicated that RRV was a significant potential risk to New Zealand if they did enter the country.

2.32 MoH believes it possible that the mosquito had been present for up to two years before it was discovered. This highlights the importance of an effective, reliable surveillance programme.

2.33 Public health staff in all parts of the country are involved in a number of activities involving exotic mosquitoes of public health significance. They are responsible for surveillance of exotic mosquitoes in ports and (since the SSM was detected in Napier) for surveillance for salt water breeding mosquitoes – both in areas where the mosquito is known to be present, and where it has not been detected.

2.34 Most public health units have received no additional funding to carry out this work. They must reprioritise other work programmes to enable it to be done, which can be difficult given the extent of the work required for mosquito surveillance.

2.35 Activities performed by public health units as part of the national surveillance programme to detect salt water breeding mosquitoes include:

- **identification of potential habitats**, i.e. checking maps, consultation with local residents, and Department of Conservation staff;
- **sampling sites** after significant rain or high tide for larvae presence;
- **elimination of habitat**[1], i.e. filling drains and depressions and preventing tidal inundation of land; and
- **special consideration** of high-risk habitats.

2.36 MoH commissioned a review of the national surveillance programme in early 1999, with a view to:

- determining whether or not the TAG could have confidence in the results provided by each region;
- providing coaching and support for the public health units performing surveillance;
- carrying out confirmation sampling; and
- offering future surveillance options.

2.37 This review recommended a once-only investment of $150,000 on equipment, software, and training, and an increase in annual expenditure of $630,000 for implementation of an acceptable ongoing surveillance programme. The former Health Funding Authority did not make the increased expenditure due to competing priorities and budget constraints. Some other improvements made as a result of the review led to more efficient and effective planning and surveillance.

2.38 A further review of the national surveillance programme was approved in May 2001 and a final report was produced in May 2002. The Government required this surveillance review to be completed before a decision would be made on the future of the response in Kaipara and Mangawhai.

2.39 The review assessed the effectiveness of the current surveillance programme for exotic mosquitoes at ports, and for the SSM. It found that:

> *While all [public health services] conducted surveillance in response to the MoH request for [southern saltmarsh mosquito] surveillance, inadequate planning, methods and outcome were achieved. Much of this was due to inadequate experience and training, coupled with too little time/resources and competing demands, to undertake the difficult task of surveying for [southern saltmarsh mosquito] in remote and inhospitable areas.*

1 Elimination of habitat is only carried out in areas involved in an eradication programme.

2.40 The review made a number of recommendations for improvement to both the port and salt water breeding mosquito surveillance programmes. These range from memorandums of understanding between public health services, port authorities and MAF to detail local responsibilities for surveillance, to extending the role of New Zealand BioSecure in the national surveillance programme to provide training and to improve the national surveillance database.

2.41 MoH has analysed the review's recommendations and set up a programme of work to address the issues raised. MoH also consulted with stakeholders before any decisions on improvements to the surveillance programme were finalised. The TAG supports the recommendations of the review.

2.42 The public health units play a critical role in mosquito surveillance and detection. Without adequate funding and training of public health units involved in mosquito surveillance, any further incursions that may occur may not be detected while eradication is feasible. As a result, the success of the current $30 million mosquito eradication programme could be jeopardised.

2.43 A probable outcome from the review will be an advanced training course for all staff involved in surveillance activities. Additional measures suggested by MoH in response to the review – including development of Best Practice Guidelines and Standard Operating Procedures for public health units – would help to define roles and responsibilities.

What Progress Has Been Made in Eradicating the Southern Saltmarsh Mosquito?

2.44 The SSM has now been eradicated in Napier. An eradication programme based in Gisborne covers the Gisborne, Mahia and Porangahau incursions, and an eradication programme started in Kaipara in October 2002.

2.45 Getting to this point in the response has involved a significant input of both human and financial resources. The action plan followed can be divided into three phases:

- **Phase 1** Containment and delimiting – reducing the risk of mosquito spread, while gathering information about the scientific and economic feasibility of eradication so that the Government can decide on what action to take.
- **Phase 2** Eradication – use of S-methoprene and *Bti* to eradicate the mosquitoes.

- **Phase 3** Surveillance – monitoring of habitat to determine presence or absence of mosquitoes.

2.46 A number of steps are required even before moving to Phase 1. Figure 2.4 below shows progress on these steps in each of the places where the SSM has been discovered (see Figure 2.1 on page 32), and Figure 2.5 on the opposite page describes the current situation.

Figure 2.4 Progress in Eradicating the Southern Saltmarsh Mosquito

	Napier	Gisborne	Kaipara/ Mangawhai
Detection	December 1998	July 2000	February 2001
Identification	December 1998	October 2000	February / April 2001
Application for resource consent	January 1999	December 2000	August 2001
Resource consent granted	February 1999	Pending	December 2001
Section 7A of the Biosecurity Act 1993 invoked	January 1999	December 2000	December 2001
Cabinet approval for control/ containment	February 1999	November 2000	June 2001
Application of *Bti* started	January 1999	November 2000	December 2001
Cabinet approval for eradication	April 1999	June 2001	June 2002
Application of S-methoprene started	August 1999	November 2000	October 2002
Surveillance phase started	April 2001	Pending	Pending
Eradication programme completed	July 2002	Pending	Pending

Figure 2.5
Current Situation

Napier (including Haumoana): No live adult mosquitoes have been detected in Napier since April 2000 or larvae since August 2000. The World Health Organisation recommendations for declaring an organism eradicated have been met.

Gisborne (including Mahia and Porangahau): Currently in eradication phase with a large reduction in mosquito numbers. Spraying of S-methoprene started in November 2000 and continued until July 2001 when the stock of S-methoprene ran out. *Bti* was used through the cooler months, and the use of S-methoprene resumed in November 2001 when a new shipment arrived. A wet, warm October resulted in some adult mosquitoes hatching, which might have been prevented if S-methoprene had been available as the temperatures increased. As a result, the eradication phase may need to be extended in Porangahau (under the Napier resource consent). Application of control agent has ceased in Mahia, and is expected to be completed before February 2003 in Gisborne.

Kaipara and Mangawhai: In June 2002 the Government decided to prepare and implement a plan to eradicate the southern saltmarsh mosquito from this area. Application of S-methoprene began in October 2002, once a shipment arrived in New Zealand.

Whitford: Incursion response under way. Thought to be an outlier, and should not be an ongoing problem.

What Have Been the Obstacles to Progress?

2.47 We found that there had been a number of obstacles to MoH making progress on the response to the SSM:

- There have been delays in seeking and obtaining **statutory approval** to apply mosquito control agents (see pages 43-46).
- The **decision-making process** for determining what future action to take has been protracted at times (see pages 46-48).
- There are differences in **funding a biosecurity response with a health impact** compared with funding a response with an impact on the economy or biodiversity (see pages 48-50).
- There was a **delay in identification of the SSM in Gisborne** (see page 50).

- The outbreak that was first identified in Napier was well managed but **lessons were not learned**, and the decision-making process in subsequent outbreaks was less efficient – this situation is at least partly the result of having a **new lead agency** at each site (see pages 51-52).

The Statutory Context

2.48 Under the Biosecurity Act 1993, the responsible Minister (the Minister for Biosecurity) is able to exempt actions taken in relation to an organism from the provisions of Part 3 of the Resource Management Act 1991 (the RMA) for up to 20 working days, if the Minister is satisfied that it is likely that:

a) The organism is not established in New Zealand, the organism is not known to be established in New Zealand, or the organism is established in New Zealand but is restricted to certain parts of New Zealand; and

b) The organism has the potential to cause all or any of significant economic loss, significant adverse effects on human health, or significant environmental loss if it becomes established in New Zealand or if it becomes established throughout New Zealand; and

c) It is in the public interest that action be taken immediately in an attempt to eradicate the organism.

2.49 The effect of this last condition is that the Biosecurity Act can be used to apply this exemption from the RMA only for Phase 2 of the action plan – eradication (see paragraph 2.45 on pages 39-40).

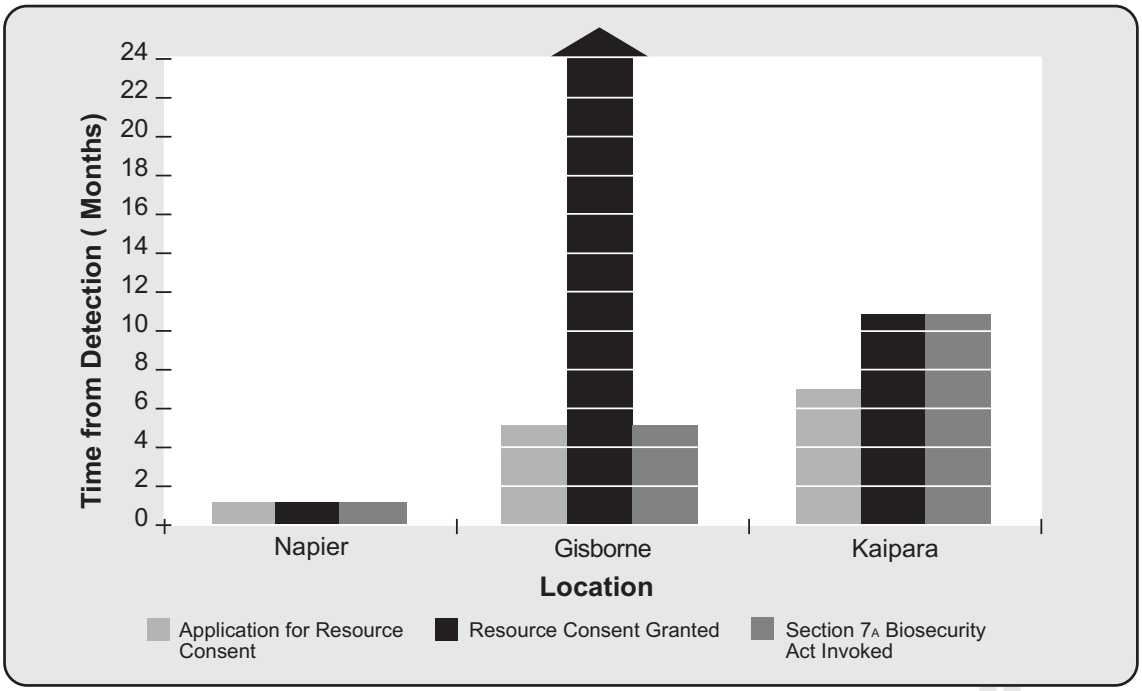
2.50 In other circumstances, MoH must apply under the RMA for a resource consent before it is able to use control agents against the mosquito. Resource consents are permission to use or develop a natural or physical resource and /or carry out an activity that affects the environment. They are obtained from regional, district and city councils, and (occasionally) from the Minister of Conservation.

2.51 The RMA requires district and regional plans to explain when activities may require a resource consent, and the type and category of consent that is necessary. Most resource consents are "non-notified" and require permission to be gained from all landowners (stakeholders) for the action to be taken – in this case to apply mosquito control agents.

Uncertainty and delays in applying for resource consent to spray mosquito control agents have led to delays in spraying which could have compromised the incursion response against the southern saltmarsh mosquito, particularly in Kaipara.

2.52 Figure 2.6 below shows the very large differences in the time taken to get statutory approvals for the incursion responses in Napier, Gisborne and Kaipara.

Figure 2.6
Comparison of Time Taken to Obtain Statutory Approvals



Obtaining the statutory approvals for the Napier response was well handled.

2.53 In Napier, MoH requested action under the Biosecurity Act to eradicate the SSM, and the Minister for Biosecurity invoked section 7A of the Act. This meant that application of *Bti* to spray the mosquito began on 21 January 1999 – less than four weeks after the initial identification.

2.54 The exemption under the Biosecurity Act described in paragraph 2.48 may be extended for a period of up to two years if it is necessary to continue action beyond the 20 days, by regulations made under the authority of section 7A(6) of the Biosecurity Act. The MoH drafted regulations ready

for approval by the Cabinet, but they were not needed because of the prompt issue of the resource consent (see next paragraph).

2.55 The resource consent process in Napier was relatively straightforward as there were only a small number of properties involved, including some that were under the care of Hawke's Bay Regional Council. The Council was aware the request was urgent, and it gave resource consent without written assent from every property owner. Strong public support for the response was crucial in the Council taking this approach.

In contrast, in Gisborne the response is continuing under Biosecurity Act provisions, and resource consent has not been obtained.

2.56 Tairawhiti Healthcare lodged the resource consent application two months after the SSM was identified. This initial delay was caused by poor communication and confusion around whether a consent was required for ground application of a control agent. In addition, the consent application was lodged as a draft rather than a final application, which led to further delay.

2.57 On receiving the application for resource consent, the Gisborne District Council (GDC) applied section 92 of the RMA, which *require[s] the applicant to provide further information relating to the application*. MoH has twice transferred the operation of the mosquito response in Gisborne – first to the Napier mosquito response centre, and then to New Zealand BioSecure. There is some disagreement about who is now responsible for obtaining the resource consent – Tairawhiti Healthcare as the original applicant or MoH (possibly through its current contractor, New Zealand BioSecure). The GDC's request for more information has not yet been filled, and a resource consent has not been obtained at the time of this report.

2.58 At present, the response is continuing under a two-year extension of an exemption under the Biosecurity (Resource Management Act Exemption) Regulations 2001 (SR 2001/3). This over-rides the need for resource consent up to 8 February 2003, when the Exemption is due to expire. It is expected that application of the control agent in Gisborne will be completed before the exemption expires. However, MoH must remain aware of the situation and ensure that appropriate action is taken if it expects that spraying will need to continue after 8 February 2003.

In Kaipara there was a delay of almost seven months before the resource consent process was begun, as there was uncertainty over whether it would be required.

2.59 Although Auckland District Health Board (ADHB) advised the Auckland Regional Council that it might apply for resource consent in February 2001 immediately after the SSM was detected in Kaipara, no further progress was made until August 2001.

2.60 At its 26 February 2001 meeting, the TAG had decided not to recommend a response in the Kaipara region as initial indications suggested eradication was not feasible (see paragraphs 2.67-2.75). Because no decision on how to respond had been taken, ADHB did not continue with the resource consent application, apart from identifying a number of landowners.

2.61 At this time MoH believed that ADHB had the process under way.

2.62 In August 2001, after more information about the extent of the incursion had been obtained, New Zealand BioSecure, under contract to MoH, took over the incursion response and the consent application. There were approximately 140 landowners who needed to be located and their written permission obtained. No spraying could be done until resource consent had been obtained, as the response was deemed to be in the control/containment, not the eradication phase.

2.63 From September 2001 the risk of mosquito spread in Kaipara was escalating as time passed due to rising temperatures, and no action was being taken. The risk increased as time passed, with greater movements of people and boats over the holiday period. The delay could have compromised the response and was a cause for concern.

2.64 In the second week of December 2001, MoH asked the Associate Minister for Biosecurity for permission to implement phase one of an eradication attempt that would enable spraying to take place before Christmas 2001. The Minister gave permission to move into an eradication phase, using the powers under section 7A of the Biosecurity Act, and spraying could begin without resource consent. This action was 11 months after detection of the SSM in Kaipara. We believe that MoH could have initiated this action with the Minister much earlier.

These cases illustrate the tensions that exist between the need to act quickly against a pest, and the legitimate expectations of communities that they will be consulted.

2.65 The RMA expects environmental and community issues to be addressed. However, delays in applying for resource consents and in processing them may, ironically, result in incursion responses continuing under a Biosecurity Act exemption, without the community being formally consulted.

2.66 Other contradictions have occurred – for example, when the Associate Minister for Biosecurity invoked the Biosecurity Act in Kaipara, thereby initiating eradication, she had to over-ride a previous Cabinet decision for control and containment. Although not the intention, this action could have been seen as pre-empting a Government decision for eradication.

The Decision-making Process

Eradication in Kaipara was initially not considered feasible, but new information reopened the possibility of this approach. However, MoH continued to try to collect better information, as initially agreed, and did not approach the TAG or the Treasury to explore whether a decision for long-term action against the mosquito in Kaipara might be expedited. More open communications, and an agreed understanding of the circumstances for revisiting the initial decision, would have enabled the issues to be considered sooner.

2.67 In June 2001, the Government agreed to apply $6 million[2] over the four years 2001-02 to 2004-05 to respond to the SSM incursions by:

- attempting to eradicate the mosquito from the Gisborne, Mahia, Napier and Porangahau sites; and
- implementing containment and control measures in the Kaipara sites.

2.68 The decision to restrict funding to control and containment in Kaipara and Mangawhai was influenced by a three-day delimiting survey by Auckland DHB. The survey showed that the potential habitat for the mosquito was too large for eradication and led the TAG to conclude that eradication was not feasible. Further analysis by Hawkes Bay HealthCare staff in March 2001 – incorporating aerial surveillance and tidal effects – found that the potential habitat was about one-eighth of what was initially estimated (2710 hectares compared with up to 22,000 hectares).

2 $2.25 million in each of the first two years and $0.75 million in each of the third and fourth years – in total $5 million for pest and disease response, and $250,000 per year for policy advice.

2.69 Although this further analysis gave an early indication that eradication was potentially feasible, MoH continued with a bid for funding for control and containment in Kaipara, while more knowledge about the extent of the incursion was gained and work on the pathways by which the mosquito arrived in Kaipara was undertaken. MoH considered that this information was required to assess the cost-effectiveness of eradication.

2.70 MoH did not communicate the new information to the Treasury at this point, although this information was reflected in the Cabinet paper of June 2001 that recommended control and containment as the preferred option for action.

2.71 MoH also did not consult the TAG about the change in the estimate of potential habitat for Kaipara and Mangawhai. The TAG thus had no opportunity to reconsider its recommendation against eradication in the light of the new information. (MoH has since agreed that a TAG should be convened if significant new information becomes available.)

2.72 In August 2001, the TAG advised that the proposed investigation on pathways was unlikely to provide any useful information.

2.73 The review of surveillance was not reported until May 2002. It had been planned to start a year earlier, but the start was delayed because the contractors commissioned to undertake the review needed to attend a disease outbreak in Australia. If the results of the surveillance review had been available sooner, MoH could have made earlier progress on the long-term decision on the future of the incursion response.

2.74 In the event, MoH prepared a new cost-benefit analysis (CBA) in February 2002 and a paper recommending eradication of the mosquito from Kaipara and Mangawhai went to Cabinet in June 2002. Some of the time taken between the first draft of the CBA and finalising the Cabinet paper resulted from a misunderstanding between MoH and the Treasury about the assumptions that formed the basis of the CBA.

2.75 Having a Cabinet decision by June 2002 allowed sufficient time to place an order for S-methoprene, so that application could begin in October 2002. The Cabinet decision agreed to the preparation and implementation of a plan to eradicate the SSM from Kaipara and Mangawhai, and approved funding of $30.355 million over the years 2002-03 to 2005-06.

2.76 Funding is appropriated for response phases that are designed to ensure adequate time is provided to enable information to be collected and advice prepared for the Government. In this case, the process took 16 months. We consider that, with more open communications, an agreed understanding of the circumstances for revisiting the initial decision would have enabled the issues to be considered sooner.

2.77 The effect has been that, despite aerial spraying being started in December 2001, the control agent best suited for eradicating the mosquito was not being used.[3] The SSM may have spread, with a new detection of the mosquito in Whitford in March 2002.[4]

Funding a Biosecurity Response with a Health Impact

MoH is unable to reprioritise expenditure from its small biosecurity funding to pay for an incursion response.

2.78 MoH receives a small proportion of Votes Biosecurity. In 2001-02 MoH was appropriated $149,000 for Vote Biosecurity – Health in the main estimates. An additional $2.25 million was appropriated for the long-term response to the SSM, through the supplementary estimates (see footnote 2, on page 46).

2.79 Vote Biosecurity – Health currently funds interception responses and the national mosquito surveillance programme.

2.80 The $149,000 covered:

- scientific and policy advice to support the Government on biosecurity issues that affect public health;
- taxonomy services; and
- exotic mosquito surveillance training for public health staff.

2.81 This level of funding means that any incursion response to an exotic mosquito of public health significance requires immediate additional funding, either from reprioritising existing funding within Vote Health, or by an urgent request to the Government for additional funding.

3 If a response is in control and containment phase, *Bti* is used. However, the TAG has suggested '*S-methoprene … remained the pesticide of choice*', and that *'S-methoprene is more cost effective than Bti'*. Even so, S-methoprene is generally used only when a decision to eradicate is taken.

4 The mosquito may have spread to Whitford from Kaipara, but it is also possible that the Whitford discovery is a new incursion.

The process to prepare a response recommendation and seek funding is complex – the analysis required is inevitably resource-intensive and time-consuming.

2.82 The process to prepare a response recommendation and seek funding is complex and can take many months. It can, however, be speeded up – the Cabinet approved $4.6 million within three weeks to increase protection from foot and mouth disease during the UK outbreak. The length of time to approve funding for the response to the SSM incursion in Napier resulted in:

- higher costs, because long-term operational plans could not be made; and
- poor morale and staff insecurity over the future of their employment.

2.83 We understand that delays and difficulties in decision-making also led to poor staff morale among public health staff dealing with the incursion in Kaipara.

2.84 The effect of the delay in Napier was mitigated by the high level of trust that existed between MoH, the Health Funding Authority and HealthCare Hawke's Bay. Otherwise, the response to the SSM might have been compromised.

There was uncertainty and some disagreement over whether the response should be treated as a biosecurity issue or a health issue.

2.85 In November 2000, Cabinet approved an appropriation of $816,000 for containment and delimiting of SSM in Gisborne, Mahia and Porangahau. Half of these funds came from a fiscally neutral transfer of funds from Vote Health. The other half was from Vote Biosecurity – Health.

2.86 Tensions between health and biosecurity priorities became apparent at this time. Public health staff were concerned at public health money being used for what they perceived to be a biosecurity issue. The funding to be used had been intended to pay for an expected overspend in the smoking cessation programme (but in the event, the excess did not occur and the funding would not have been required for this purpose).

2.87 MoH has since had internal discussions about the options for considering Vote Biosecurity or Vote Health funding. It has been agreed within MoH that when funding is to come from Vote Biosecurity then it should be compared against other biosecurity priorities. If the expenditure is to be

funded by Vote Health, then it should be considered against other health priorities.

2.88 MoH bids for biosecurity funding are processed in the Treasury by the health analysts. They considered funding for the incursion response to the SSM against other health priorities. It is clear to the officials in both the Treasury and MoH that the mosquito incursion response would not rank highly when compared to other health sector demands, such as immunisation or reducing hospital waiting lists.

2.89 We believe there is a strong case for assessing all biosecurity risks on the same basis – both against priorities in the main sector under threat (in this case health) and against other biosecurity risks. This would meet the important principle that decisions about relative priorities should be transparent – and to be transparent, the decision-makers (Ministers) need access to full and consistent information and analysis.

Delay in Identification of the Southern Saltmarsh Mosquito in Gisborne

Process failures within the national surveillance programme led to delays in the mosquito being identified in Gisborne.

2.90 MoH is responsible for monitoring for the presence of the SSM. In Gisborne, public health officers collected mosquito samples on 11 July 2000, and sent them to the Ministry's taxonomy consultant to identify.

2.91 It was a further three months before the specimens were reported as southern saltmarsh mosquitoes. Poor procedures for specimen handling and logging, lack of follow-up for results, and poor communication between the consultant and the public health service all contributed to the delay.

2.92 MoH recognised that process failures had occurred and asked its Chief Internal Auditor to provide a report into the delays, and to recommend changes in procedures. The internal audit has resulted in improved procedures and protocols designed to avoid future delays.

Learning the Lessons – the Role of the Lead Agency

2.93 MoH has been responding to the SSM for nearly four years. During this time, a large amount of knowledge has been gained about mosquito eradication. It might therefore be expected that each response would be managed better than the last, and lessons learned in one response applied to the next.

2.94 Some elements of the later responses came from the Napier experience. For example, delimiting was initiated as soon as the SSM was identified. The TAG was convened, and it reviewed the responses. In addition, there was a nation-wide pool of officers trained in SSM detection.

2.95 However, as described in the preceding paragraphs, the initial response in Napier was better managed than both subsequent responses in the initial phases in a number of important respects – in particular, gaining resource consent.

Difficulties have arisen with having a new lead agency at each site.

2.96 The public health service at Tairawhiti Healthcare took the lead for the response in the Gisborne region. At the start, there was a reluctance to rely on the Napier response centre and a feeling among staff of Tairawhiti Healthcare that they did not want to cede control over their region's response.

2.97 After the errors in applying for resource consent described above (see paragraph 2.56 on page 44), MoH and the TAG saw the need to tighten procedures and co-ordinate the two responses. In addition, Tairawhiti Healthcare's senior management had indicated it had difficulties in providing the necessary capital to purchase equipment required for a long-term response against the mosquito in the Tairawhiti region.

2.98 MoH contracted the Napier mosquito response centre to undertake operational planning for both the regions. This approach utilised the expertise and experience available in the Napier region, while using the local knowledge in Gisborne to focus on surveillance, ground spraying and community liaison.

2.99 The Gisborne response continued effectively after this change. But when the Kaipara incursion was detected the response fell to Auckland District Health Board (ADHB). However, ADHB was uncertain about what action it should take and its role, as it was not certain whether a response would go ahead. The delays in resource consent application and in taking action under the Biosecurity Act led to delays that may have compromised the Kaipara response.

What Arrangements Are Now in Place?

MoH has taken action intended to address some of the problems experienced with the Gisborne and Kaipara responses.

2.100 In June 2001, MoH sought tenders for the provision of a National Exotic Mosquito Response Centre. New Zealand BioSecure (a small independent company) secured the contract, and provides the expertise for the current response and any future response while it holds this contract.

2.101 A number of staff at New Zealand BioSecure have been involved in work on the SSM since the Napier response, and have gained valuable experience. By placing New Zealand BioSecure in this central role, it is expected that in future lessons will be learned, and that mistakes and duplication of effort will be avoided.

2.102 New Zealand BioSecure's responsibilities include:

- provision of appropriately experienced and expert staff to manage the response to incursions of exotic mosquitoes of public health significance;
- provision of support, advice, information and guidance to public health services responding to an incursion;
- monitoring and advice to the Chief Technical Officer (Health) of the adequacy of public health services' mosquito surveillance and response activities;
- review and revision of the national surveillance programme for exotic mosquitoes of public health significance; and
- preparation of an arbovirus[5] surveillance and response plan, and a health promotion programme for travellers.

5 A virus that can be transmitted by insects.

2.103 New Zealand BioSecure was also the successful tenderer for services to identify mosquitoes sent in as part of the national mosquito surveillance programme and to maintain a national database of mosquito surveillance results.

2.104 New Zealand BioSecure provides these services, while MoH maintains ownership of intellectual property and equipment.

2.105 In the course of this audit, concerns were raised with us about the process that MoH had followed in letting the contract for the National Exotic Mosquito Response Centre. We put these concerns to MoH officials and they assured us that they had followed appropriate tendering procedures. We have not examined these procedures as part of this audit, although we have suggested that MoH improve the arrangements affecting the TAG as outlined in paragraphs 2.27 and 2.28 on page 36.

2.106 We note that, while MoH has limited capacity to reprioritise expenditure within Vote Health, there is even less capacity to reprioritise within the funding of the work by New Zealand BioSecure. This will mean that funding for any further incursions would need to be sought from some other source.

2.107 The recent surveillance review (see paragraph 2.38 on page 38) stated that New Zealand BioSecure is providing a commendable service. The report recommends that more responsibility be given to New Zealand BioSecure to assist public health services with mosquito surveillance in high-risk sites, and that the current short-term contract between MoH and New Zealand BioSecure be lengthened to increase staff stability and allow for more forward planning.

The contract with New Zealand BioSecure represents a dedicated resource.

2.108 New Zealand BioSecure will have a central role in each incursion. In contrast, in Gisborne and again in Kaipara the response teams began with limited experience. Using the same people on each response should help avoid these problems in future. As New Zealand BioSecure holds the contract for mosquito identification and for maintaining the national database of mosquito surveillance results, the problems with specimen identification described in paragraphs 2.90-2.92 on page 50 should also be avoided.

2.109 The local public health units dealing with the incursion responses had to do so alongside their many other public health responsibilities. The responses created additional unplanned work. New Zealand BioSecure is able to dedicate experienced staff to the mosquito response.

2.110 At present, it is usual for MoH to have one-year contracts with service providers, because funding is uncertain until agreed by Cabinet. In this case, Cabinet has approved funding for eradication of the SSM from the Gisborne, Mahia, Napier and Porangahau sites until 2004-05, and in the Kaipara and Mangawhai sites until 2005-06. We see no reason why MoH should not go to tender for a longer-term contract for delivery of these services, since long-term funding has been agreed.

MoH and the TAG monitor the activities of New Zealand BioSecure.

2.111 New Zealand BioSecure's contract includes provision of monthly reports on progress on all aspects of its services. MoH reviews and responds to the reports and regularly meets with New Zealand BioSecure to review activities. The TAG also receives the reports and questions the contractor at its meetings.

2.112 Further checks are provided by public health staff who can provide advice to MoH on any concerns regarding the surveillance programme, and by an expert taxonomist who confirms specimen identification results.

Which Department Should Be Responsible for Responses to Mosquito Incursions in Future?

2.113 It is anomalous that MoH should have been given responsibility for managing mosquito incursion responses when the responsibility and accumulated knowledge for managing responses to incursions of other exotic insects resides with MAF. Management of mosquito incursion responses is not core to MoH's role.

2.114 However, since the SSM was detected in Napier, MoH personnel have gained extensive experience and expertise in dealing with mosquitoes. As a result, they are now better equipped to respond to incursions of mosquitoes, and have more expertise with these pests than any other biosecurity agency.

2.115 A Memorandum of Understanding between MAF and MoH dated 11 March 2002 reflects MoH's wish to remain responsible for dealing with incursions of mosquitoes. Responsibility for incursion responses to all other terrestrial pests has been placed with MAF, including mosquitoes of animal health significance.

2.116 By retaining responsibility for mosquitoes of public health significance, MoH can also ensure that the effect on human health is given due weight in any risk assessment or priority setting. MoH would also have to take responsibility for the public health costs of any failure to manage an incursion. In this way, MoH can counterbalance MAF's focus on the primary production sector – although MoH equally has to be cognisant that some mosquitoes may pose other risks, including to animal health.