

## Case Study 3

# Response to the Incursion of the Painted Apple Moth



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### Why Did We Select This Case Study?

- 3.1 The MAF-led response to the Painted Apple Moth (PAM) has been high-profile and controversial. There has been disagreement between members of the Technical Advisory Group, established to advise MAF on the response, over the measures required to eradicate this pest. There has been widespread criticism of how MAF has managed this response and this criticism led the Group Director, MAF Biosecurity to commission an independent review of the response.
- 3.2 We therefore examined the circumstances that led to the need for this review. We have not examined in detail events since those that led to the review. This case study also gave us the opportunity to look at the work of the Forest Biosecurity Group within MAF Biosecurity.

### Key Findings

- 3.3 *MAF commissioned an independent review almost two years into the PAM response, in reaction to widespread criticism of how it was being handled. The review found that poor relationships between key people in the forestry sector had resulted in ineffective use of the knowledge gained during the earlier white spotted tussock moth response. (See paragraphs 3.20-3.26 on pages 63-65.)*
- 3.4 *Insufficient resources were dedicated to the PAM response. Failure to establish a breeding colony of PAMs at Forest Research<sup>1</sup> in Rotorua, and to properly consider an expert's offer to develop a synthetic pheromone for use in the response, has resulted in delays that have led to the PAM spreading from the original infestation site. (See paragraphs 3.27-3.44 on pages 66-69.)*
- 3.5 *Proceedings of the first two Technical Advisory Group (TAG) meetings were not minuted, terms of reference for the TAG were not agreed until after the group had met five times, and the response had been under way for more than two-and-a-half years before an operational plan was produced. Decisions taken by the TAG, such as to target-spray as opposed to blanket-spray, were not clearly documented. (See paragraphs 3.45-3.49 on pages 69-70, and paragraphs 3.65-3.67 on page 73.)*
- 3.6 *Senior MAF managers did not have sufficient oversight of and control over the response. (See paragraphs 3.50-3.54 on pages 70-71.)*

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1 New Zealand Forest Research Institute Limited ( a Crown Research Institute).

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- 3.7 *MAF did not adequately, and at an early enough stage, communicate to all stakeholders the action planned. In February 2001, preparation for aerial spraying was recommended, but a community advisory group established by MAF did not meet until September 2001 to discuss MAF plans to begin aerial spraying in November 2001. Consequently, MAF has been on the back foot trying to respond to criticisms, which has detracted from efforts to establish constructive relationships with communities to overcome difficult and complex issues. (See paragraphs 3.55-3.64 on pages 71-73.)*

### Recommendations

- 3.8 *MAF should ensure that neither personal nor organisational issues are allowed to deflect the energy and action that is required to achieve the management and/or eradication of pests in the most efficient and cost-effective manner. While there will always be disagreements between different groups about aspects of responses to incursions, the disagreements should be debated and managed as part of a transparent and documented process. (See paragraph 3.24 on page 65.)*
- 3.9 *An appropriately qualified incident controller with adequate resources should be used for all important incursion responses. (See paragraphs 3.30-3.32 on page 66.)*
- 3.10 *When offers of assistance from recognised experts are received, they should be fully considered. (See paragraphs 3.33-3.44 on pages 67-69.)*
- 3.11 *Key meetings should be minuted, and discussions resulting in decisions for action must be recorded in a clear and comprehensive manner. (See paragraphs 3.45-3.46 on page 69, and paragraphs 3.65-3.67 on page 73.)*
- 3.12 *The Director-General and Group Director, MAF Biosecurity should take a more active role in overseeing incursion responses, and addressing industry and public concerns about responses in a timely manner. Measures should be introduced to ensure that senior MAF managers are kept aware of, and (where necessary) involved in, responses while they are under way. Such measures should include a delegation of power from the Director-General to the Group Director, MAF Biosecurity, to oversee and (where necessary) direct the Chief Technical Officers in the conduct of their duties. (See paragraphs 3.50-3.54 on pages 70-71.)*
- 3.13 *A community advisory group should be convened early in the planning of a response whenever the response has the potential to affect a community. (See paragraphs 3.55-3.64 on pages 71-73.)*

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### Introduction

- 3.14 The PAM was detected in the Auckland suburb of Glendene on 15 April 1999 and identified on 5 May 1999. Five months later, the PAM was detected in the Mount Wellington/Panmure area, some 15 kilometres from Glendene. At both sites the moth was first observed by a member of the public, who reported the find to MAF personnel.
- 3.15 Shipping containers and pallets were present in the vicinity of both sites, and it is thought likely that this was the pathway by which the PAM entered New Zealand. Surveys of these two populations indicate that the PAM was present for at least six months before being detected.
- 3.16 Since the original detections, the distribution of PAM has been found to be more extensive around the Glendene area and is also found in Avondale, Glen Eden, Kelston and Titirangi, along the Whau River, and on Traherne Island.

*Figure 3.1  
Painted Apple Moth*

The PAM is native to Australia where it causes low-level defoliation of pine trees and is considered to be a minor pest on apple trees. In New Zealand, it is feared that it could be a serious threat to our pine forests, horticulture and environment. It is known to feed on wattle and acacia trees and has also been found on kowhai, karaka and mountain ribbonwood trees, and might cause damage to these and other native species.



If the PAM was allowed to spread throughout the country MAF has estimated the cost to the forestry sector to be between \$58 million and \$356 million over the next 20 years. This range does not include any estimation of the potential damage to native species.

The male PAM looks like many other moths and can best be identified under a microscope. The caterpillar, however, is quite distinctive. The late caterpillar stages are quite large (up to two to three centimetres in length), and very hairy. It is grey and yellowy-orange in colour, with four distinct tufts.

The natural spread of the moth is relatively slow because the female cannot fly and so its natural dispersion is limited to 200-300 metre “hops”. The PAM can also spread by hitchhiking on vegetation that is moved from one area to another, or by the caterpillar crawling short distances between trees.



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### How Did MAF Respond to the PAM?

- 3.17 The early stages of the response involved visual searches of plant material in the areas where the PAM was detected, followed by ground spraying<sup>2</sup> and the removal of plants on which the PAM is known to live. As new infestations were found, the search area was gradually widened. More extensive surveys using live female traps were conducted when female PAMs became available, to determine the extent of the PAM infestation. This information was required for the TAG to be able to decide what action was needed to respond.
- 3.18 In the case of the PAM, it was necessary to establish a breeding colony as soon as possible to supply the large number of moths needed, for a variety of purposes, in the response. One of these purposes is to use live female moths to attract males as a means of establishing how widely spread the infestation is. The sooner MAF knows the extent of an infestation, the sooner a decision can be taken about whether an eradication attempt is feasible. As a general principle, the earlier it is found (and hence the more restricted the distribution of a pest) the easier it will be to eradicate and the higher the probability of success.
- 3.19 Difficulties were experienced in establishing a breeding colony of PAMs. This, in turn, meant that there were insufficient moths available for the live female traps and pheromone (sex attractant) development. Fortunately, the female PAM is flightless and therefore does not spread as quickly as other pests (e.g. the white spotted tussock moth). However, the delay in establishing a breeding colony in turn delayed the PAM response, and the pest spread further from the original Glendene infestation during the following months and years.

<sup>2</sup> Ground spraying involves application of control agents from the ground, and is commonly used for vegetation other than tall trees and inaccessible vegetation.

### Independent Review of the Response

**MAF commissioned an independent review almost two years into the PAM response, in reaction to widespread criticism of how it was being handled. The review found that poor relationships between key people in the forestry sector had resulted in ineffective use of the knowledge gained during the earlier white spotted tussock moth response.**

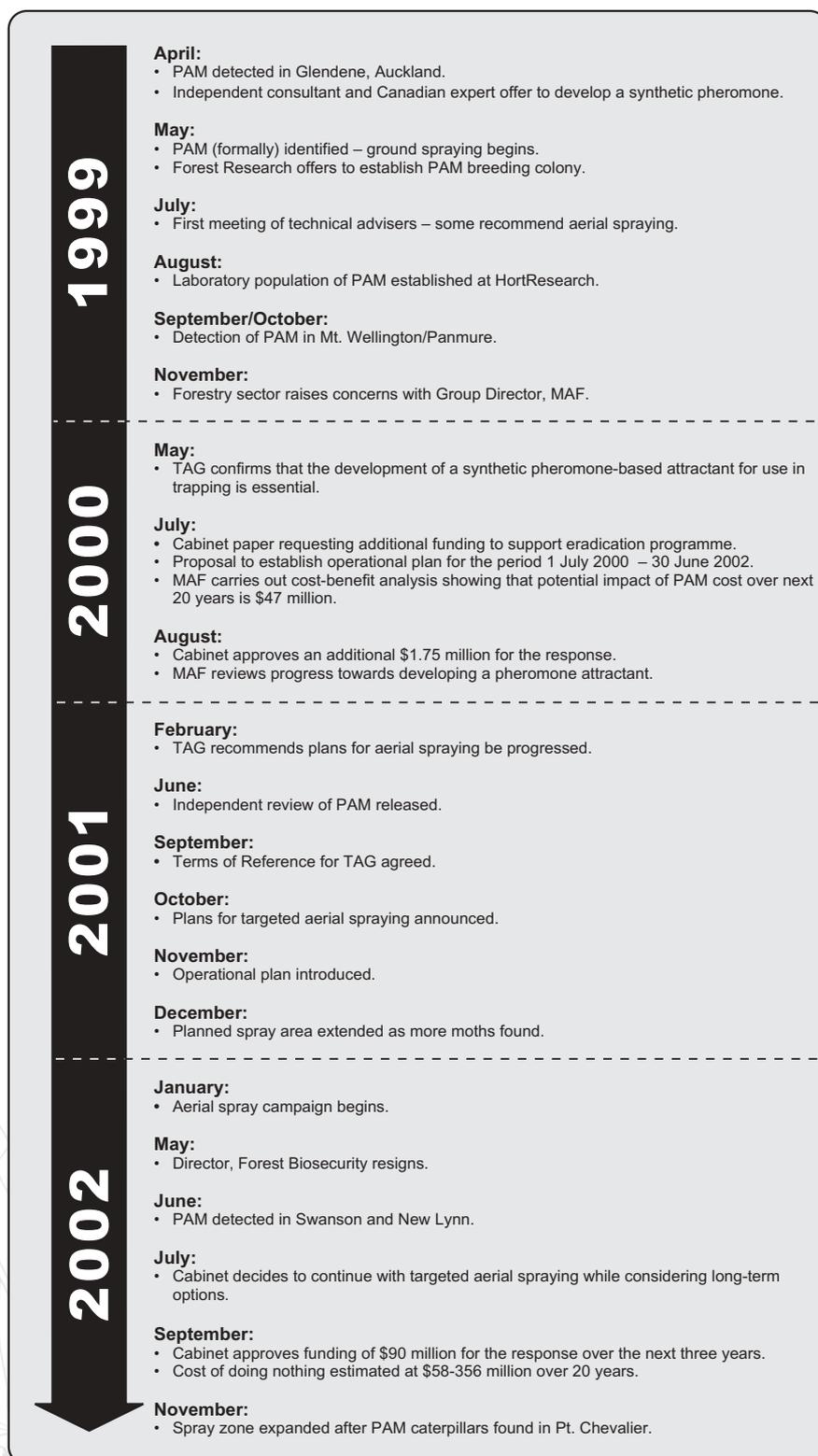
- 3.20 In response to widespread criticism of how MAF was handling this incursion, the Group Director, MAF Biosecurity commissioned an independent review of the management of the PAM programme. The review reported in June 2001 and made 33 recommendations under four headings – general, technical, managerial, and general management of incursions.
- 3.21 MAF has since acted upon 32 of the 33 recommendations.<sup>3</sup> However, the review had not been started until almost two years after the PAM was first detected, and long after the response had been criticised by people in the forestry sector.
- 3.22 The review reported that a *web of personal issues affecting working relationships* (between key people involved in the forestry sector) had compromised the effectiveness of the PAM response. We understand that the reasons for these poor relationships are related, in part, to:
- The merger of the Ministry of Forestry and the Ministry of Agriculture that was opposed by some parts of the forestry sector.
  - Those involved in the Ministry of Forestry-led response that eradicated the white spotted tussock moth from Auckland in 1996 feeling that criticism of their work was unjustified – this criticism came from a review of the tussock moth response. One of the authors of that review was until May 2002 the MAF Director, Forest Biosecurity, and was responsible for the response to the PAM.

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3 The one recommendation not implemented by MAF was to develop a National Pest Management Strategy for the PAM. MAF believed that the resources needed to develop the Strategy would be better applied to other aspects of the response.

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Figure 3.2  
Timeline of Response to the Painted Apple Moth Incursion





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- 3.23 We believe that the poor relationships significantly affected the PAM response. For example, the knowledge and experience gained during the earlier tussock moth response has not been used effectively in the PAM response.
- 3.24 MAF should ensure that neither personal nor organisational problems are allowed to deflect the energy and action that is required to achieve the management and/or eradication of pests in the most efficient and cost-effective manner. While there will always be disagreements between different groups about aspects of responses to incursions, the disagreements should be debated and managed as part of a transparent and documented process.
- 3.25 The review *identified a number of areas for improvement of the programme, and stated that there were some specific decisions made that were inappropriate. For example, it is possible that had MAF contracted for rearing PAM earlier or had MAF utilised the rearing facility in Forest Research, Rotorua these problems would have been solved earlier and progress on PAM eradication would be more advanced at this point.*
- 3.26 Though the review concluded that *overall the PAM eradication strategy appears to have been appropriate and that prospects for eradicating the insect still appear good*, we believe that the response contained flaws and errors of judgement made by senior MAF staff. The elements of MAF's response to the PAM about which we have the most concerns are the:
- insufficient **resources** dedicated to the response;
  - MAF's rejection of **offers of assistance** from experts;
  - poor standards of **documentation**;
  - lack of **management oversight** and control by senior MAF management over the response; and
  - the timing of community **consultation** about proposed action to eradicate the PAM.

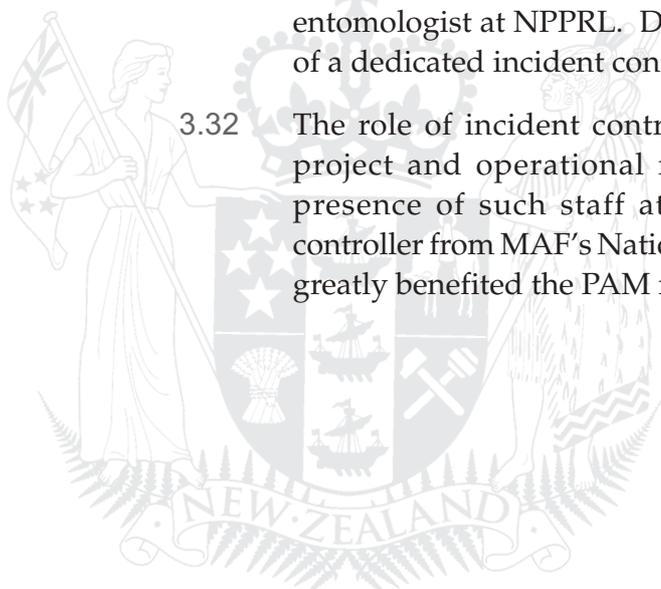


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### Resources

#### **Insufficient resources were dedicated to the PAM response.**

- 3.27 Responsibility for management of the PAM response is with the Director of the Forest Biosecurity Group within MAF Biosecurity. This group is much smaller than the Animal and Plants Biosecurity Groups, and the small number of staff working on the PAM programme has affected the effectiveness of the response.
- 3.28 When the PAM was first detected, the Forest Biosecurity Group had four staff – including the Director – and a part-time administration assistant. This was one factor that led to the Director of the group taking a very “hands-on” approach in the response, often acting more as an operational manager than as Director.
- 3.29 Two years into the response, Forest Biosecurity had an additional staff member and its complement has recently been increased to seven. The Plants Group and the Animal Group have 25 and 24 staff respectively.
- 3.30 A lack, and inappropriate use, of resources at the National Plant Pest Reference Laboratory (NPPRL) have also affected the response. When it began operations in 1998, the NPPRL was not responsible for incursion management or field investigations. An increase in the number of suspected incursions being reported, coupled with the addition of investigation of environmental and forest pests to its role, has led to NPPRL staff having to undertake duties for which they are not appropriately qualified or experienced.
- 3.31 In the case of the PAM response, the Director Forest Biosecurity gave the role of incident controller, in addition to his usual duties, to an entomologist at NPPRL. Despite the best efforts of staff at NPPRL, the lack of a dedicated incident controller adversely affected the PAM response.
- 3.32 The role of incident controller should be undertaken by someone with project and operational management experience. We think that the presence of such staff at NPPRL, or the secondment of an incident controller from MAF’s National Centre for Disease Investigation, would have greatly benefited the PAM response.



### Offers of Assistance

**Failure to establish a breeding colony of PAMs at Forest Research in Rotorua, and to properly consider an expert's offer to develop a synthetic pheromone for use in the response, resulted in delays that have led to the PAM spreading from the original infestation site.**

- 3.33 The supply of live moths obtained from a laboratory breeding colony was a critical aspect of the PAM response. Large numbers of moths are required to:
- supply live females for use in traps;
  - supply material for pheromone identification;
  - test what food the moths eat (host testing); and
  - test the efficacy of insecticides.
- 3.34 In the same month that the PAM was first identified in New Zealand, a new quarantine facility opened at Forest Research in Rotorua. On 17 May 1999, Forest Research contacted MAF and offered to establish a PAM breeding colony in this facility, and to conduct host testing trials free of charge. This offer was not accepted by MAF at the time, nor subsequently when the offer was repeated. Instead, the contract to establish a breeding colony was given to another laboratory that had limited success – particularly in its early attempts – in undertaking this technically difficult work.
- 3.35 One of the independent review's recommendations was that *a PAM colony be developed at the Forest Research facility as soon as possible*. This recommendation came more than two years after the initial offer to assist came from Forest Research. Had a laboratory colony been successfully established earlier in the response, more moths would have been available for the actions described above and it is likely that the response would have progressed more rapidly than has been the case.
- 3.36 Shortly after the PAM was detected in Auckland in April 1999, an independent consultant made an offer to MAF to carry out work to develop a synthetic version of the PAM's pheromone. He proposed to do this work in conjunction with a Canadian expert who is a world authority on pheromone identification in Lymantriids (moths). This same team had successfully identified and synthesised the pheromone of the white spotted tussock moth that was eradicated from the Auckland area by the Ministry of Forestry in 1996-97.

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- 3.37 This offer of assistance was also rejected without, in our opinion, having been adequately considered, and the work was given to another laboratory. The independent review recommended that *MAF use whatever channels might be available to secure the support of the [Canadian expert] as developer of the pheromone in parallel with the [laboratory doing this work]. Supply of material through the [independent consultant] from the PAM colony to be established at Forest Research seems the most workable option [to do this].*
- 3.38 The reasons given to us by the Director, Forest Biosecurity for not accepting the original offer of assistance from the independent consultant and Canadian expert were that:
- this work should be conducted in New Zealand to develop capability in our own laboratories; and
  - there was a team of scientists at the laboratory given the contract for this work and this was seen as being preferable to having an individual responsible for the work (though, in effect, two people would have been responsible for the work).
- 3.39 While the first reason is laudable in intent, and staff at the laboratory to which the work was given were well qualified to do this work, the fact remains that the Canadian expert had recently demonstrated his ability in this field – having successfully developed the pheromone for the white spotted tussock moth.
- 3.40 In our view, since the Canadian expert offered to do this work (at no cost to MAF, we understand), his offer should have been accepted. This would have given MAF the opportunity to have two well-qualified research groups working on this technically difficult task. MAF’s priority in responding to exotic pests should be to ensure that the chances of a successful response are maximised.
- 3.41 We do not consider the second reason to be valid, since the consultant and Canadian expert had proven expertise and success in work of this kind. If MAF was genuinely concerned about the risks associated with giving technically difficult work to just one individual as opposed to a team, it is reasonable to expect that it would have taken the opportunity to establish breeding colonies in more than one laboratory. MAF was given this opportunity when Forest Research offered to establish a colony free of charge (an offer that was rejected as already described).
- 3.42 Nor do we consider that either of the above reasons explains why the Director, Forest Biosecurity never returned a call made by the independent consultant when the original offer to provide assistance was made.



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- 3.43 It may be that the reason these two key offers of assistance were rejected early in the response was because of the poor working relationships that existed between the Director, Forest Biosecurity and key players in the sector.
- 3.44 It was not until the TAG meeting in September 2001 that the need to involve the Canadian expert in the pheromone development work was discussed. Just prior to this meeting, and in accordance with the independent review's recommendations, PAM material had been provided to the New Zealand independent consultant who had offered to work with the Canadian expert. MAF could have taken this course of action some two-and-a-half years earlier, and there is a strong likelihood that the response to the PAM would have been different if it had done so.

### Documentation

**Proceedings of the first two TAG meetings were not minuted, terms of reference for the TAG were not agreed until after the group had met five times, and the response had been under way for more than two-and-a-half years before an operational plan was produced. Decisions taken by the TAG, such as to target-spray as opposed to blanket-spray, were not clearly documented.**

- 3.45 No minutes were taken of the first two TAG meetings that were intended to provide the Director, Forestry Biosecurity with independent, expert advice on the best course of action to take to eradicate the PAM. TAG meetings are key elements of major incursion responses, and a record of actions discussed and considered at these meetings is therefore important – especially when there is disagreement about what the best course of action might be.
- 3.46 MAF has often replied to criticisms about its management of the PAM response by stating that the TAG supported its decisions and actions. Given MAF's dependence on TAG's advice (which is the reason it was established), it is not acceptable that meetings of the TAG were not minuted.
- 3.47 Terms of reference for the TAG were not agreed until September 2001, by which time it had already met five times. The independent review found that TAG members were unclear about its purpose – in particular, over whether it was responsible for communications to stakeholders in addition to its role of providing technical advice to the Director, Forest Biosecurity.

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- 3.48 Although correspondence from the Forest Biosecurity Advisory Committee to MAF, in November 1999, highlighted concerns about the lack of an operational plan for the PAM response, it was not until 30 November 2001 that such a plan was produced. The Director, Forest Biosecurity informed us that such plans were of limited use in responses to biological organisms due to the complexity and unpredictability of a response.
- 3.49 It is our view that such factors reinforce the importance of having detailed plans to:
- prepare for unforeseen events;
  - ensure that action is effectively co-ordinated; and
  - be used as the basis for communicating with stakeholders about the action being taken.

### Management Oversight

#### **Senior MAF managers did not have sufficient oversight of and control over the response.**

- 3.50 As detailed above, an independent review of the PAM response was commissioned by the Group Director, MAF Biosecurity and was published in June 2001. However, forestry sector representatives raised concerns with the Group Director, MAF Biosecurity as early as November 1999 (for example, about the failure to involve the Canadian *lymantriid* expert in the development of the moth's pheromone). Despite there being a number of meetings between senior MAF officials and concerned forestry industry representatives at this time, little action was taken to address these concerns until after the review was published.

- 3.51 In our view, had the Group Director, MAF Biosecurity, taken a more active role in overseeing the response, some of the problems that have been encountered could have been identified and remedied earlier.

- 3.52 Under the Biosecurity Act 1993, Chief Technical Officers have access to extensive powers in the management of an incursion response like the PAM. The Directors of three of the groups within MAF Biosecurity (Animal, Plants, and Forest) are each Chief Technical Officers.



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- 3.53 These arrangements have been deemed necessary by the management of MAF Biosecurity to give the Chief Technical Officers wide personal authority and independence. However, in the case of the PAM incursion, in our view neither the Group Director, MAF Biosecurity nor the then Director-General exercised the degree of management control over the response they were able to.
- 3.54 The Ministry of Agriculture and Forestry (Restructuring) Act 1997 makes it clear that all officers and employees are subject to the direction of the Director-General of MAF in the exercise of functions, powers and duties under any act administered by MAF. Under the State Sector Act 1988, the Director-General is able to delegate to an employee the power to direct a statutory officer in the exercise of their statutory functions. Thus, the Group Director, MAF Biosecurity could have been delegated the power to direct the actions of the Chief Technical Officer responsible for the PAM response, which would have allowed him to be far more closely involved in the management of the response.

### Consultation

**MAF did not adequately, and at an early enough stage, communicate to all stakeholders the action planned. In February 2001, preparation for aerial spraying was recommended, but a community advisory group established by MAF did not meet until September 2001 to discuss MAF plans to begin aerial spraying in November 2001. Consequently, MAF has been on the back foot trying to respond to criticisms, which has detracted from efforts to establish constructive relationships with communities to overcome difficult and complex issues.**

- 3.55 By their nature, responses to pests like the PAM are high-profile exercises that involve many different agencies and affect communities in the areas where the pest is present.
- 3.56 The aerial spraying of insecticide is a technique that can be used to eradicate pests from areas that are not suitable for other methods of pest control. However, the use of aerial spraying is a controversial pest control method that requires thorough planning and management. Members of the public in areas where aerial spraying takes place need to be kept informed about why the spraying is necessary and what effect (if any) it might have on the health of people who may come into contact with the spray.

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- 3.57 Aerial spraying was used successfully in the response to the white spotted tussock moth in Auckland in 1996-97.
- 3.58 The TAG meeting in February 2001 recommended that preparations for aerial spraying be progressed. In October 2001 the Government directed MAF to pursue eradication using targeted aerial spraying, and spraying was planned to start in November 2001. A number of factors resulted in the spraying not starting until January 2002.
- 3.59 The Community Advisory Group did not meet until September 2001. The group was established by MAF to ensure that the communities affected by the spraying had the opportunity to raise concerns with MAF. A key issue in both the timing and quality of consultation was the considerable resources required to run an effective communication programme.
- 3.60 We agree that it would be inappropriate to set up a community advisory group if there was only a remote chance of aerial spraying taking place. However, when such action is likely to be necessary, and certainly where a response has the potential to affect a community (as in the case of the PAM), a group should be set up as early as possible.
- 3.61 Setting up a community advisory group would not avoid some of the difficult issues that need to be addressed, but it would signal MAF's intention to be positive and its wish to work with affected communities. Such groups also give MAF the opportunity to discuss with local communities other actions (such as the removal of trees from river bank and amenity areas).
- 3.62 We understand from national and international experts with experience of responding to biosecurity incursions, including foot and mouth disease, that public relations and media management are vital components in any response. In the case of the PAM response, those components were not managed early enough. Consequently, MAF has been on the back foot trying to repond to criticisms, which has detracted from efforts to establish constructive relationships with communities to overcome difficult and complex issues.
- 3.63 MAF acknowledges that the PAM will not be the last such pest to be detected in the Auckland area. The high volume of passengers and cargo that arrive in Auckland from overseas means that it is the most likely area where new pests will become established. Aerial spraying is high-profile, costly and controversial. MAF therefore needs to consider the use of this measure not just in the context of a single pest incursion but also in relation to the possibility of having to use it to eradicate other pests that might pose even higher risks.



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- 3.64 The Group Director, MAF Biosecurity promotes an approach to biosecurity that involves an informed public understanding and contribution to the success of the Biosecurity Programme by being vigilant and contacting MAF if biosecurity breaches are suspected. This approach will only be successful if MAF demonstrates a commitment to involving the public in biosecurity matters – particularly in relation to incursion responses.

### Targeted Aerial Spraying

- 3.65 The minutes of the TAG meeting in September 2001 record agreement that targeted aerial spraying of the PAM would be undertaken in the first instance to minimise the impact on the environment and the community. Some TAG members indicated that blanket-spraying (used by the Ministry of Forestry to eradicate the white spotted tussock moth from Auckland in 1996-97), would have a higher probability of achieving eradication than targeted spraying. We understand that the use of targeted spraying to eradicate the PAM is the first time such a spraying technique has been attempted anywhere in the world.
- 3.66 Despite this, the preferred option of the TAG was to undertake targeted spraying with a moderate to moderately high chance of success, followed by an assessment of progress after three aerial spraying operations.
- 3.67 The minutes record why the decision to target-spray as opposed to blanket-spray was taken. However, there is no record of any discussion about the risk of targeted spraying failing to eradicate the PAM, and what subsequent effect this would have on the response and possible need to blanket-spray.



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3.68 Since the TAG meeting in September 2001 at which it was agreed that targeted aerial spraying using a helicopter should be undertaken, MAF has done a lot to inform and reassure communities affected by the response that the spraying programme is necessary and safe – including:

- setting up a Community Advisory Group to represent residents' interests;
- setting up a health monitoring programme to assess any health concerns that may arise from the spraying programme;
- establishing an 0800 telephone line for people to call about concerns they have about the spraying;
- providing easily accessible free medical advice to residents;
- making available information on the components of the spray and its impact on moths and other organisms; and
- widely publicising when spraying is planned to take place.

3.69 Starting aerial spraying was beset with problems – a number of which have been beyond the control of MAF – which caused significant delays. The problems that needed to be overcome included:

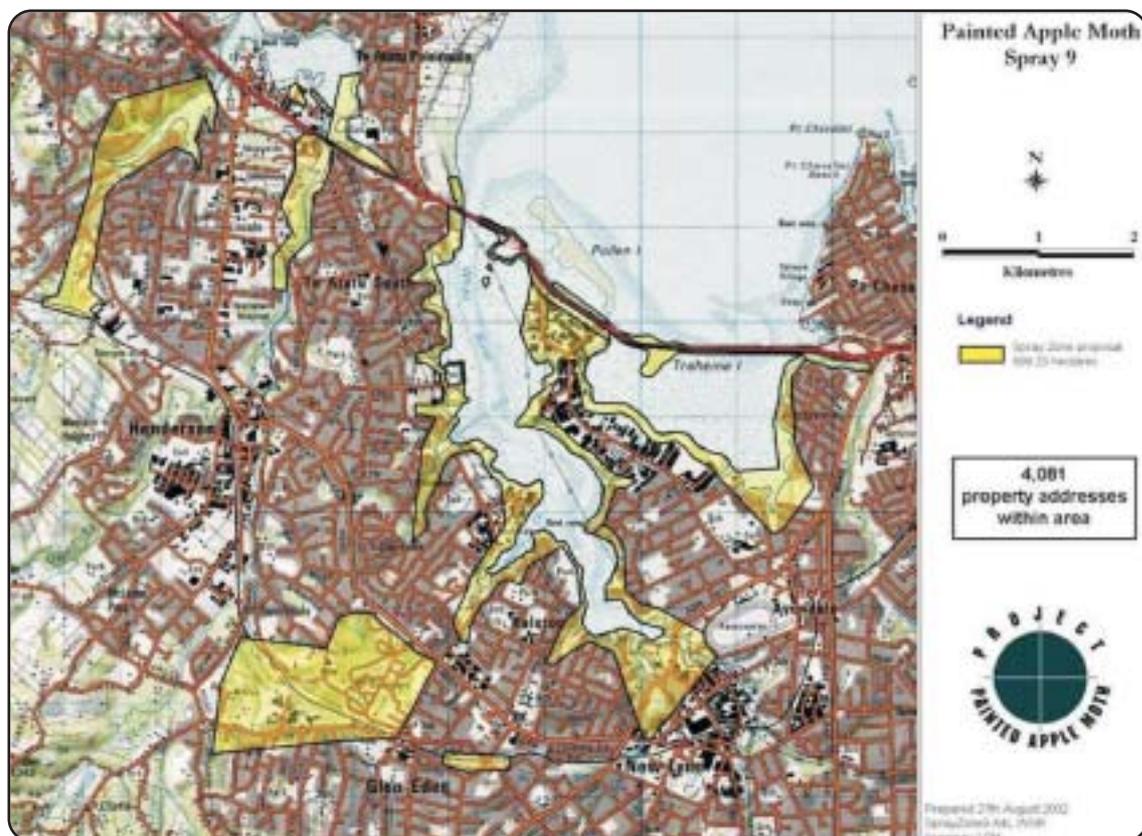
- restrictions on low-flying aircraft and noise in the Waitakere District Plan;
- expanding the area to be sprayed following an increase in the number of moths being caught in traps in December 2001;
- clarifying the formulation of the spray and obtaining approval from the Environmental Risk Management Authority to be able to use the spray; and
- dealing with operational problems, such as equipment not working properly.

3.70 Periods of about 3-4 weeks elapsed between each aerial spraying operation, with each spray taking an estimated eight hours to complete. The target zone originally encompassed 550 hectares and around 3000 West Auckland residential and industrial properties. The response team found that it was not possible to complete a spraying operation in one day because of the weather. Instead, two fine, calm mornings were required for completion.

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- 3.71 In May 2002, MAF decided to use a fixed-wing plane in addition to the helicopter for future aerial sprays. The small, specialist plane should be able to complete spraying the targeted zone in considerably less time than it takes a helicopter on its own.
- 3.72 Targeted aerial spraying is part of a wider programme to eradicate the PAM. In addition, the trapping programme, intensive ground spraying and a host-removal operation, as well as property-by-property surveys, will continue.
- 3.73 May 2002 also saw the resignation of the Director, Forest Biosecurity from MAF. MAF announced the appointment of a new Director, Forest Biosecurity in August 2002.
- 3.74 Figure 3.3 below shows the targeted aerial spray zone as at 27 August 2002.

*Figure 3.3  
The Targeted Aerial Spray Zone  
(27 August 2002)*



Source: MAF Biosecurity

## CASE STUDY 3 – RESPONSE TO THE INCURSION OF THE PAINTED APPLE MOTH

### Recent Developments

- 3.75 In early-June 2002 some PAM caterpillars were found in Swanson and New Lynn outside MAF's 550ha target zone where aerial spraying, aimed specifically at the moth's caterpillars, had been carried out.
- 3.76 In late-June 2002, MAF prepared a paper for Cabinet setting out options for a range of responses available to the Government. The options were as shown in Figure 3.4 below.

*Figure 3.4  
Options for a PAM Response*

Option	
1	Undertake no further control of the PAM.
2	Establish a programme to prepare for long-term management of the PAM aimed at controlling its economic and environmental impacts.
3	Pursue eradication through mainly ground-based methods.
4	Pursue eradication by aerial spraying of all known larval infestations (up to 6000 hectares).
5	Pursue eradication by aerial spraying across the entire area where male moths have been trapped (some 35,000 hectares).

3.77 On 3 July 2002, the Government announced a decision to continue with targeted aerial spraying of the PAM in Auckland, while it takes more time to consider the options of continued eradication or long-term management of the pest.

3.78 In September 2002, the Government announced that, due to the discovery of PAM larvae outside the spray zone, the area to be aerial sprayed would be increased to between 8000 and 12,000 hectares, affecting 37,500 properties. Cabinet has approved funding of \$88.25 million over the next five years for this expanded eradication programme.

3.79 In November 2002, PAM caterpillars were detected in Point Chevalier and the spray zone was again increased – by 500 hectares.