

ENVIRONMENTAL RISK MANAGEMENT AUTHORITY

**ERMA**  
*New Zealand*



NGĀ KAIWHAKATŪPATO WHAKARARU TAIAO

ENVIRONMENTAL RISK MANAGEMENT AUTHORITY

# ANNUAL REPORT ON THE AERIAL USE OF 1080

For the year ended 31 December, 2008

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## | 1 EXECUTIVE SUMMARY

This second annual report on the aerial use of 1080 is an outcome of the Environmental Risk Management Authority's 2007 decision on the reassessment of 1080, which allowed its continued use with additional controls.

It includes an update on the progress made on the Authority's 2007 recommendations that best practice guidelines be developed, and that further research be undertaken. Also included is a synopsis of the data from the post operational reports for operations carried out in the 2008 calendar year.

The requirements for aerial 1080 operators to report on operations came into effect on 1 January 2008. Post-operational reports are posted on the ERMA website as they are received, and can be viewed at: [www.ermanz.govt.nz/1080/](http://www.ermanz.govt.nz/1080/)

There are four main parties that undertake aerial 1080 operations: the Animal Health Board, the Department of Conservation, Regional Councils, and other land managers.

There were 74 aerial 1080 operations conducted during 2008 over nearly 600,000 hectares, mainly targeting possums and rabbits. The size of operations varied to suit the location and the purpose, with the largest covering 52,000 hectares and the smallest 65 hectares. The average active ingredient rate for possum control was approximately 3 grams of 1080 per hectare, and 5 grams per hectare for rabbits.

A comparison between aerial application data for 2006 and for 2008 shows a marginal increase by some users. It is noted that pest management cycles span several years; therefore it is too soon to see trends in this report.

Water monitoring was carried out on 22 aerial 1080 operations, with 149 tests reported. No 1080 was detected in catchments used for drinking water supply.

Information is gathered on public concerns and incidents associated with 1080 use. Some 30 complaints and incidents were recorded in 2008. All were investigated, and instances of breaches of the controls were few.

However, a common theme to some incidents was seen. The Authority is concerned that in a small number of cases poor communication resulted in the deaths of pets and livestock. The outcomes of a number of the investigations showed that although the operators had conducted consultation, there was room for improvement in the clarity of communication with affected parties. ERMA New Zealand continues to monitor those responsible.

The *Communications Guideline for Aerial 1080 Operations* was published in March 2009 on the ERMA New Zealand website at: [http://www.ermanz.govt.nz/hs/1080resources/ERMA\\_1080\\_Guidelines.pdf](http://www.ermanz.govt.nz/hs/1080resources/ERMA_1080_Guidelines.pdf). It is expected that implementation of the guideline will benefit all stages of aerial 1080 operations for all involved.

In its 2007 decision on the use of 1080, the Authority stressed the importance of more and better research. It is very encouraging to be able to report on 37 research projects into improvements to 1080, alternatives to its use, and other related topics.

Overall, the first complete year's annual report on aerial 1080 operations indicates that the controls and recommendations put in place by the Authority are having a positive effect. While it is still too early to see trend data emerging, this report provides a baseline for longer term study and the results of the monitoring of operations will inform future decisions on the use of 1080.

## | 2 INTRODUCTION

The Environmental Risk Management Authority completed a reassessment of 1080 for use in pest control in August 2007. In reaching its decision, the Authority was mindful that the use of 1080 was a polarising issue about which many New Zealanders had deeply held views. It recognised the importance of engagement through better communication and consultation with the public, local communities, Māori and special interest groups; and made a commitment to a new management regime for 1080 operations to address an urgent need for further improvements in the way 1080 is used.

After careful consideration, the Authority concluded that the benefits of using 1080 outweighed the adverse effects, and it released its decision to allow the continued use of 1080, with additional controls. It also made recommendations for the development of best practice guidelines, and for further research.

This annual report provides an update on progress in implementing the new regime; in particular monitoring of the conduct of operations in accordance with the management regime established by the Authority's decision. It provides information on aerial 1080 operations that were carried out in the 2008 calendar year, and research that was carried out up until July 2009.

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### Sectors that use aerial application of 1080 for pest control

Operations using 1080 are carried out to control pests including possums, wallabies, rabbits, rats and stoats. The ability to aerially apply 1080 is considered by users to be a key advantage over ground-based methods for pest control over rugged or remote land.

Different users carry out pest control operations for different reasons. Four main sector groups use aerial application of 1080: the Animal Health Board, the Department of Conservation, Regional Councils, and other land managers.

#### *The Animal Health Board*

New Zealand has had a national eradication campaign against bovine tuberculosis (TB) under way since the 1970s. The disease is considered to be one of the country's most serious animal health problems and is regarded as a threat to people who come in contact with infected animals, contaminated milk or diseased carcasses. Possums are a wild animal species which are susceptible to TB and act as a vector (host) which spreads the disease to cattle and deer.

The aim of New Zealand's TB control programme is to achieve TB free status by 2013. Nearly all of New Zealand's major international trading partners have attained this standard, but New Zealand continues to have an undesirable level of infection.

New Zealand's control programme is guided by the National Pest Management Strategy for Bovine TB (NPMS), and managed by the Animal Health Board. The programme works in two ways:

- disease control – aims to control and contain the spread of the disease within cattle and deer herds; and
- vector control – aims to control and contain the wild animal species most responsible for spreading the disease to cattle and deer.

The Animal Health Board uses a combination of ground control methods and aerially applied 1080 in their strategy for containing and controlling possums. The Animal Health Board's total area under sustained management is about 8.1 million hectares.<sup>1</sup> Approximately 3.6 million hectares of this area was reported as having been covered by possum control operations in 2008.

Approximately 1.8 million hectares (22 percent) of the Animal Health Board's area under sustained management is controlled using aerial application of 1080. In 2008 approximately 434,000 hectares were treated using this method.

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<sup>1</sup> Based on 2006 figures.

### *The Department of Conservation*

Possums and rats eat the eggs of native birds, attack their young and cause significant damage to native trees. In the absence of natural predators, possums and rats (as well as stoats and ferrets) have flourished and caused a great deal of damage to native animals and birds, and to the native forest environment.

The Department of Conservation uses a combination of ground control methods and aerial application of 1080 to improve the health of forest ecosystems by reducing the impact of browsing, competition and predation by possums and rats, and protect threatened species from other pests through targeted by-kill.<sup>2</sup>

The Department's total area under sustained management is about 1 million hectares. In 2008 approximately 260,000 hectares of this area was covered by animal pest control operations. Of this area approximately 133,000 hectares (51 percent) was treated using aerial application methods.

### *Regional Councils*

Under the Resource Management Act (1991) Regional Councils are responsible for maintaining indigenous biological diversity in their regions. They are also required to manage pests under the Biosecurity Act.

Regional councils use a combination of ground control methods and aerial application of 1080 to target pests that are a threat to biodiversity. This reduces the impacts of browsing, competition and predation by possums, and protects threatened species from other pests.

Regional councils have a combined area under sustained management of approximately 2 million hectares and control pests over about 800,000 hectares annually.<sup>3</sup> In 2008 Regional Councils reported aerial applications of 1080 that covered approximately 3,000 hectares.<sup>4</sup>

### *Other land managers*

Rabbits are a two-fold threat to New Zealand's environment. On production land they reduce profitability and adversely affect sustainable use of the land. They also have a direct impact on biodiversity through eating native plants, and an indirect impact of sustaining high densities of predators.

Farmers and land managers (such as Land Information New Zealand) use a combination of aerial use of 1080 and other rabbit control methods to protect grasslands.

There are no current estimates for the size of the total rabbit control area. However there are large areas of the South Island considered 'extremely' or 'highly' rabbit-prone areas (mostly in Otago, Canterbury and Marlborough). In 2008, 1080 was aerially applied for rabbit control over approximately 16,000 hectares in areas of Otago and Canterbury.

Land managers (such as foresters) also use a combination of ground control methods and aerial application of 1080 to reduce the impact of browsing by possums in indigenous or production forests. In 2008, 1080 was aerially applied for privately funded possum control over approximately 11,000 hectares.

<sup>2</sup> Planning for scavenging pest numbers to be reduced by secondary poisoning.

<sup>3</sup> Data for regional councils as at 2006.

<sup>4</sup> Does not include work done for control of rabbits on behalf of other land managers.

### Application information

The pest management cycle for an area under sustained management spans several years. In each year parts of the area will be controlled, with different control methods employed in each part at different times. This means that some parts of an area under sustained management will be treated by aerial application on a five to seven year cycle, while other areas may only ever be covered by ground control methods.

Table 1 shows a comparison between the available data for total treatment areas in 2006 and those reported in 2008. These figures show a marginal increase in aerial application by some users. This data provides a snapshot of the sizes of the areas within the area under sustained management treated by aerial application in the current year and does not necessarily indicate a trend.

**Table 1 Animal Pest Control Treatment Area (000 hectares)<sup>5</sup>**

|                            | AHB   | DOC | REGIONAL COUNCILS | OTHER LAND MANAGERS |        |
|----------------------------|-------|-----|-------------------|---------------------|--------|
|                            |       |     |                   | RABBIT              | POSSUM |
| 2006 Aerial treatment area | 396   | 127 | 61                | –                   | –      |
| 2008 Aerial treatment area | 435   | 133 | 3                 | 16                  | 11     |
| 2006 Total treatment area  | 5,004 | 136 | 800               | –                   | –      |
| 2008 Total treatment area  | 3,630 | 260 | –                 | –                   | –      |

<sup>5</sup> A dash (–) signifies that there was no data available.

## | 3 BEST PRACTICE GUIDANCE

In its 2007 decision on 1080 the Authority acknowledged a need for further improvements in the way 1080 is used. The Authority recommended that management practices for aerial application be standardised around best practice to ensure consistency.

Best practice guidelines will help operators meet or exceed the mandatory controls. The guidelines will also help communities and concerned parties identify whether an operator's practices meet the expected standards.

The Authority identified two key areas as priorities for the development of best practice guidance - communication, and management of aerial 1080 operations.

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### **Communication**

The *Communications Guideline for Aerial 1080 Operations* was published in March 2009 and is available on the ERMA New Zealand website at: [http://www.ermanz.govt.nz/hs/1080resources/ERMA 1080 Guidelines.pdf](http://www.ermanz.govt.nz/hs/1080resources/ERMA_1080_Guidelines.pdf)

The requirements for communication are based on the potential of the operation to affect people and communities. The guideline recommends that consultation be undertaken at three different stages: first, when the need for a pest control programme is identified; second, when a programme is being established; and third, during the planning of an operation and its operational stage.

The guideline outlines processes for consultation, notification, communication with various groups and individuals, recording, and handling complaints.

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### **Management of aerial 1080 operations**

The National Possum Control Agencies (NPCA) are leading a project to review existing industry Standard Operating Procedures and guidelines in order to develop standardised industry-wide guidelines for the management of aerial 1080 operations. This project is progressing in 2009/10.

## | 4 AERIAL PEST CONTROL OPERATIONS

This section is divided into three parts. The first provides a synopsis of the data brought together in the mandatory post-operational reporting of information about the management of an operation, including a communication overview and assessment of outcomes. The second looks at monitoring information collected. The third section provides a synopsis of the reported incidents and public concerns, and how the agencies responded.

The requirements for post-operational reporting were set out in the Authority's decision on 1080 in 2007. Operational managers are required to submit information after an aerial 1080 operation, including:

- who undertook the operation and why;
- information about the 1080 formulations used and application rates;
- the location and size of the operation;
- monitoring information, including
  - » water monitoring, if it was carried out in conjunction with the operation, and
  - » applicable species monitoring;
- an assessment of the outcomes of the operation;
- an overview of the communication activities (consultation and notification) and the outcomes of that communication;
- an overview of any incidents and complaints related to the operation and the actions that resulted from those incidents and complaints; and
- a map of the operational area.

Individual post operational reports are available on the ERMA New Zealand website at: <http://www.ermanz.govt.nz/hs/1080resources/watchlistindex.html>

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### Post-operational reports

#### *Operation management*

ERMA New Zealand received reports for 74 operations in the 2008 calendar year, covering approximately 600,000 hectares. The majority of this area was treated by the Animal Health Board (73 percent), and the Department of Conservation (23 percent). The remaining area was treated for rabbit and possum control by regional councils, farmers and other land managers.

Of the reported operations:

- 41 were funded by the Animal Health Board;
- 14 were funded by the Department of Conservation;
- 3 were funded by regional councils; and
- 16 were funded by other land managers, of which:
  - » 14 were funded for rabbit control;
  - » 2 were privately funded for possum control.

#### *The 1080 formulations applied and application rates*

The majority (51) of the aerial possum control operations reported using 1080 laced cereal baits with a concentration of 1.5 grams of 1080 per kilogram of bait. Carrot baits were used on nine possum control operations. Deer repellent was used in seven of the possum control operations, three of which used cereal baits laced with 1080 and coated with deer repellent (see Section 5 - Research). All of the rabbit control operations reported using carrot baits laced with 1080, at the rate of 0.2 grams per kilogram of bait.



Bait application rates for possum control operations varied between 1 kilogram of bait per hectare and 6 kilograms of bait per hectare, with rates for rabbit control varying between 11 kilograms of bait per hectare and 35 kilograms of bait per hectare.

The average active ingredient application rate for possum control operations was approximately 3 grams of 1080 per hectare. The average rate for rabbit control was approximately 5 grams of 1080 per hectare.

### *Location of operations*

The number of aerial 1080 operations in each region, and the sectors using 1080 varied in 2008 depending on the reasons for use, topography and land cover. See Table 2 below.

In 2008, the regions with the largest number of aerial 1080 operations were West Coast and Canterbury. However, the reason for the operations differed. The West Coast has 37 percent coverage of indigenous forest and aerial application of 1080 for possum control is considered a key tool in its TB programme. In Canterbury, indigenous and planted forests only account for about 8 percent of the land cover and possum control is mostly undertaken with ground control methods. The majority of aerial 1080 operations in Canterbury were small, carried out for rabbit control.

**Table 2 – Number of aerial 1080 operations in each region in 2008<sup>6</sup>**

| REGION <sup>7</sup> | ANIMAL HEALTH BOARD | DEPARTMENT OF CONSERVATION | REGIONAL COUNCIL | OTHER LAND MANAGEMENT |          | TOTAL AERIAL OPERATIONS EACH REGION (NUMBER) | AERIAL APPLICATION EACH REGION (000 HA)* |
|---------------------|---------------------|----------------------------|------------------|-----------------------|----------|--|--|
|                     |                     |                            |                  | RABBIT                | POSSUM   |  |  |
| Bay of Plenty       | 1                   | –                          | –                | –                     | 1        | 2  | 47                                       |
| Canterbury          | 1                   | 1                          | –                | 9                     | –        | 11   | 26                                       |
| Hawke's Bay         | 5                   | –                          | –                | –                     | –        | 5  | 52                                       |
| Manawatu/Wanganui   | 5                   | 3                          | –                | –                     | –        | 8  | 56                                       |
| Marlborough         | 3                   | –                          | –                | –                     | –        | 3  | 59                                       |
| Otago               | 2                   | –                          | –                | 5                     | –        | 7  | 13                                       |
| Southland           | –                   | 1                          | –                | –                     | –        | 1  | 8  |
| Taranaki            | –                   | 1                          | 1                | –                     | –        | 2  | 2  |
| Tasman              | 4                   | 3                          | –                | –                     | –        | 7  | 80                                       |
| Waikato             | 5                   | 1                          | 2                | –                     | –        | 8  | 64                                       |
| Wellington          | 1                   | –                          | –                | –                     | –        | 1  | 3  |
| West Coast          | 14                  | 4                          | –                | –                     | 1        | 19   | 183                                      |
| <b>TOTAL</b>        | <b>41</b>           | <b>14</b>                  | <b>3</b>         | <b>14</b>             | <b>2</b> | <b>74</b>                                    |  |

\*Numbers rounded to nearest thousand hectares.

### *Size of operations*

The total area of combined pest control operations carried out in 2008 is estimated to have been over 4.7 million hectares.<sup>8</sup> Within the 596,965 hectares treated by aerial application, the average size of aerial applications was about 8,000 hectares, with the largest application covering just over 52,000 hectares and the smallest 65 hectares.

<sup>6</sup> A dash (–) signifies no operations reported.

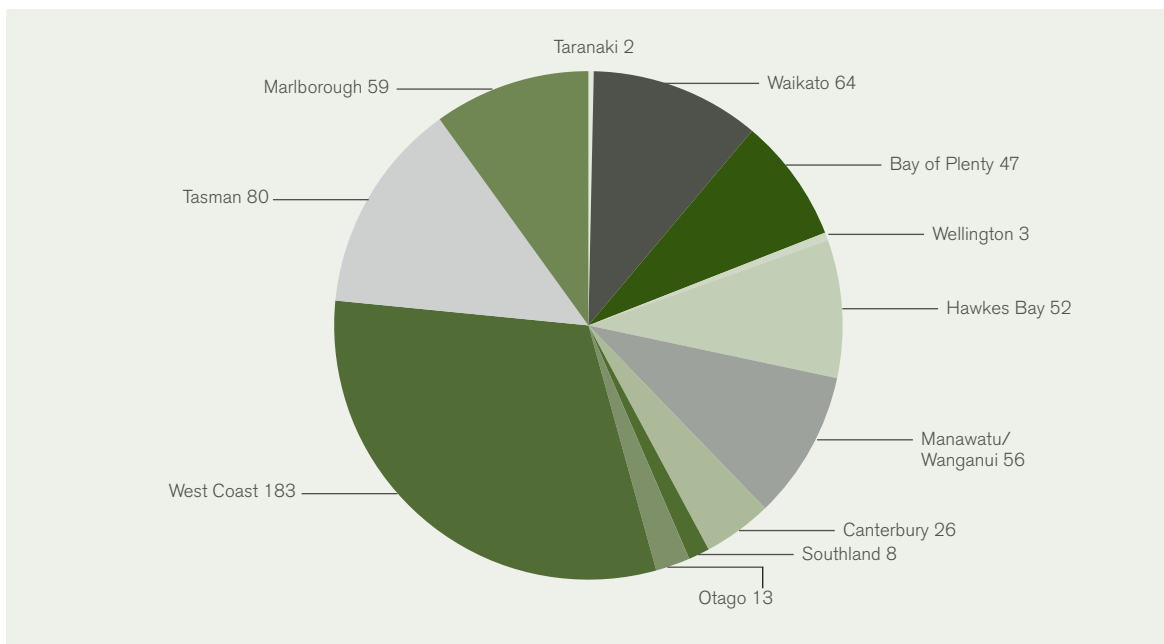
<sup>7</sup> There were no aerial 1080 applications reported for the Auckland or Northland regions in 2008.

<sup>8</sup> There is an additional unknown total area for privately funded pest control (of rabbits and possums).

The size of the operation can depend on the purpose and location of the operation. The Department of Conservation and Animal Health Board mostly carry out aerial 1080 operations to control possums and other predators over larger tracts of land. Bigger operations can increase the time it takes pest numbers to rebuild since fewer pests migrate into the heart of the treated areas. The average size of these aerial applications was approximately 10,000 hectares.

In comparison, the average size of rabbit control operations undertaken by land managers was 1,000 hectares.

Although Otago and Canterbury had comparatively large numbers of operations, the majority were small operations for rabbit control, resulting in relatively small total areas treated. See Figure 1.



**Figure 1 – Total area of aerial application in each region – 2008 (000 hectares)**

**Communication**

The *Communications Guideline for Aerial 1080 Operations*<sup>9</sup> was released in March 2009 and provides guidance on the minimum level of operational level communication expected for aerial 1080 operations. The guideline was not released in time to have an effect on the 2008 operational year. ERMA New Zealand recommends that people planning and implementing operations follow the guideline, and that agencies assess evidence of consultation and notification.

Good communication can reduce public concern and result in a reduction in incidents. ERMA New Zealand expects to see a high level of communication (that is consultation and notification) with neighbours, affected groups and communities to an extent that is appropriate for each operation.

Members of the public are able to advise ERMA New Zealand of their dissatisfaction with communication by operators during consultation and notification. Operators report objections as part of post-operational reporting.

<sup>9</sup> See ERMA New Zealand website: <http://www.ermanz.govt.nz/hs/1080resources/1080bpg.html>

Concerns about poor communication were forwarded to ERMA New Zealand from operators and members of the public for 12 of the 74 aerial 1080 operations carried out in 2008. Of the concerns reported, the majority came from the West Coast and Nelson-Marlborough area. This indicates that there is a need for improvement in the communication practices by agencies and operators working in these regions.

#### *Consultation with Māori groups*

Māori groups should be engaged as early as possible when an aerial 1080 operation is to be carried out on public land where the ongoing management by Māori of their cultural and natural resources may be affected by the operation.

Māori stakeholders were identified as having been consulted on 42 of the 53 aerial operations that took place on public land. Changes to operational plans as a result of consultation with Māori groups were not specifically identified for most operations. However, one operation report specifically showed monitoring of rongoa species as a result of this consultation.

#### *Consultation with hunting groups*

Hunting groups should be engaged as early as possible where an aerial 1080 operation is to be carried out on any public lands where hunting is prevalent and likely to be affected by an application. Early engagement of hunting groups is especially important in areas that are recreational hunting areas,<sup>10</sup> and where commercial harvesting of animals for meat is prevalent.

Hunting groups were identified as having been consulted in 23 of the 53 operations that took place on public land. Consultation with hunting groups resulted in seven operations where deer repellent baits were used, and changing baiting strategies or timing to reduce the impact on hunting opportunities was reported in other operations.

#### *Investigation into concerns about consultation*

Operators are required to carry out consultation prior to applying for permission to use 1080, and to provide evidence of relevant consultation as part of the application. Consultation is assessed by the local Public Health Unit and/or Department of Conservation as part of an application for permission. Regional Councils assess consultation for resource consent applications. Where concerns regarding consultation are brought to ERMA New Zealand's attention, they are passed on to the operator and the appropriate enforcement agency for investigation.

The outcomes of investigations into consultation concerns are conveyed to ERMA New Zealand. The 2008 results showed that although in most instances the operators had met requirements for consultation, there was room for improvement in the clarity of communication with affected parties. In one reported instance, further consultation was required before consent was issued, which resulted in changes being made to the operational boundary.

#### *Notification issues*

Notification takes place after consultation is completed. The purpose of notification is to inform affected parties of the timing, location and other relevant operational details of a 1080 operation.

Alleged breaches of notification requirements are passed on to enforcement agencies for investigation. In the majority of cases enforcement agencies did not find evidence of operators having breached regulatory requirements. In one case, an operator was provided with compliance advice when the public notice did not provide sufficient detail and a neighbour was not provided with compliant notification.

Investigations also found two operations that did not breach notification requirements, but where improvement to practices around management of signage was recommended.

<sup>10</sup> The eight recreational hunting areas are Pureora, Kaimanawa, Aorangi, Lake Sumner, Oxford, Whakatipu, Blue Mountain and Kaweka.

While most operations in 2008 did not have unresolved problems caused by poor communication, the lack of clear communication in a small number of operations was still unacceptable and seems to have resulted in unnecessary disputes. There is room for improvement by the agencies involved.

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## Monitoring

### *Water monitoring*

In drinking water supply catchments, the local Public Health Unit may require water monitoring to be carried out prior to reconnection of water intakes. This is done to ensure that drinking water does not contain 1080 residues that breach the Tolerable Exposure Limit (3.5micrograms of 1080 per litre of water).

Water monitoring may also be required in other water catchments as part of environmental monitoring.

Water monitoring was carried out on 22 aerial 1080 operations in 2008, with 149 tests reported. The tests reported a Method Detection Limit of 0.0001micrograms per millilitre.

There was no 1080 detected in catchments used for drinking water supply.

On one operation, environmental monitoring of an area that was not part of a drinking water catchment detected 1080 in three out of five samples. These results ranged between 0.0004 micrograms per millilitre and 0.001 micrograms per millilitre.

### *Species monitoring*

The monitoring of plant and animal species is carried out to determine the need for pest control operations, and the success of the operations.

Monitoring of pest species was carried out on 44 (60 percent) of the aerial 1080 operations carried out in 2008. In all of these cases, the operators reported meeting their stated target results for pest control. The reporting of pest species numbers prior to the operation was inconsistent, and reporting procedures have been modified to improve collection of this information for the 2009 operating season.

Monitoring of non target species was carried out on 11 operations to determine the effects of 1080 on those species. Species monitored included fallow deer, kea, tomtits, native trees and native birds in general. Timeframes for monitoring have meant that not all of the results of the monitoring started in 2008 were available in this reporting period. However, a summary of some of the monitoring of deer, kea, tomtits and some tree species can be found in the research section in this report.

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## Incidents and public concerns

The use of 1080 continues to attract significant public concern, and opinion continues to be deeply divided on its use. This section contains information on the incidents, objections and compliance issues reported to ERMA New Zealand that relate to 1080 use in operations that occurred between 1 January 2008 and 1 January 2009.

### Region: Waikato

Operation: Rangitoto Range

Date: June 2008

ERMA New Zealand received a complaint alleging that the operator was going to be in breach of regulatory requirements for the use of 1080, and a list of alleged failings by multiple agencies. The individual agencies responded to the complainant. He was also referred to the Department of Conservation, and to the Health Protection Officer who would be responsible for issuing permissions for the operation, so that they could take his concerns into account prior to the operation.

Operation: Peninsula Project

Date: July 2008

ERMA New Zealand received a complaint that the map in the public notice was too small to decipher, and therefore proper notification had not been given. An enforcement officer from the local Public Health Unit investigated the allegation. The officer found that a single public notice was technically deficient, but that there were other notices that were compliant. The operator was advised of the error and told to improve the quality of future notifications.

Operation: Rangitoto Range

Date: June 2008

ERMA New Zealand received a complaint that 1080 had been applied to private land without consent. An enforcement officer from the local Public Health Unit investigated the complaint. The officer found that the operator had agreed boundaries with the complainant, and recommended that both parties improve communication for future discussions.

Operation: Peninsula Project

Date: December 2008

ERMA New Zealand received a complaint about the fatal poisoning of two dogs that was alleged to have occurred as a result of a lack of notification about the operation. An investigation by an enforcement officer from the local Public Health Unit found that the operator had failed to comply with their own standard operating procedure. The operator was given advice to improve their performance regarding notification requirements.

### **Region: Bay of Plenty**

Operation: Kaiangaroa Forest

Date: August 2008

ERMA New Zealand received information that four pig-hunting dogs were killed by 1080 poisoning. An enforcement officer from the local Public Health Unit investigated the incident and found that the dog owner had left the area in which they were permitted to hunt, and had crossed into private forest that had been treated. No further action was taken.

### **Region: Taranaki**

Operation: White Cliffs

Date: September 2008

ERMA New Zealand received an allegation that the operation was in breach of several conditions of the Public Health Unit's permission for the operation. An enforcement officer from the local Public Health Unit investigated the allegations and did not find any breaches of the conditions. The complainant was advised of the outcome of the investigation.

### **Region: Hawke's Bay**

Operation: Mohaka Forest

Date: April 2008

A misapplication resulted in the death of a sheep. The landowner had gathered 1080 pellets as evidence. The operator compensated the landowner for the sheep. The landowner was informed of the requirement to have a Controlled Substances Licence to be in possession of 1080 and surrendered the pellets. The operator had failed to notify ERMA New Zealand of misapplication onto grazing land within the specified timeframe, and was warned about compliance with the reporting requirements.

**Region: Manawatu/Wanganui**

Operation: Ohau

Date: July 2008

ERMA New Zealand received a letter objecting to the operation because the area involved included the water supply catchment. This was referred to the Department of Conservation. The operator was given permission with conditions that addressed public health risks, but the operation did not proceed because of other technical matters.

**Region: Tasman**

Operation: Wangapeka

Date: May 2008

An operator applied 1080 into an exclusion zone during the operation. The operator contacted the operations manager and the operator and manager carried out an investigation. However, the operator failed to notify the appropriate agencies of the misapplication within the specified timeframe. An investigation by an enforcement officer from the local Public Health Unit resulted in the operator being warned about compliance with the reporting requirements.

**Region: Nelson/Marlborough**

Operation: Upper Motueka

Date: March 2008

ERMA New Zealand received a complaint prior to an operation that consultation requirements had not been adequately met. The complainant was given information from the operator about the consultation that had already occurred, and was advised to contact the Public Health Unit with any further concerns regarding the operation.

Operation: Upper Motueka

Date: March 2008

ERMA New Zealand received an allegation that an operator had dumped the contents of an aerial 1080 bucket during application. An investigation by enforcement officers from the local Public Health Unit found that this could not have occurred in the way described. The complainant was advised of the outcome of the investigation. The complainant also forwarded objections about this alleged incident to other organisations, and filed objections about the investigation with a request that the complaint be filed. This was done, and no further action was taken.

Operation: Avon

Date: July 2008

ERMA New Zealand received a complaint that an operator had applied 1080 on a property without consent. When ERMA New Zealand responded, the complainant advised the issue had already been resolved with the operator.

Operation: Avon

Date: July 2008

ERMA New Zealand received a complaint that several dead wild deer were found on private property as a result of a 1080 operation. When contacted by ERMA New Zealand, the complainant reported that the issue had been resolved with the operator.

Operation: Grey Medway

Date: July 2008

During an inspection of GPS flight lines following the operation, the operator noted two misapplications. An investigation by an enforcement officer from the local Public Health Unit found that the operator had failed to notify all of the required agencies of the incidence of misapplication within the specified timeframe. The operator was warned about compliance with the reporting requirements.

Operation: Upper Wairau

Date: September 2008

ERMA New Zealand received a complaint that there had been a 1080 application onto beehives, and that there had been insufficient signage in the area. An investigation by enforcement officers from the local Public Health Unit found that the land manager was not aware of the beehives on the land and had not informed the operator of their presence. The manager was also unaware of the public access over the part of the land where there was no signage. The complainant was advised of the outcome of the investigation and the Health Protection Officer advised the operator to erect a sign at the previously unidentified access point.

Operation: Upper Wairau

Date: October 2008

ERMA New Zealand received an objection to the timing of an operation, with a request that the complaint be filed. This was done, and no further action was taken.

Operation: Cannan Downs

Date: November 2008

ERMA New Zealand received a complaint that a dog's death had occurred due to a breach of permission conditions. An investigation by an enforcement officer from the local Public Health Unit did not find breaches of any conditions. The officer responded to the complainant and also noted that the unit could consider changes to the conditions on future permissions around signage requirements in some circumstances.

## Region: West Coast

Operation: Fox Whaio

Date: April 2008

ERMA New Zealand received information through media reports that pre-feed pellets had 'rained' on trampers in the area prior to an operation. As the pellets are non-toxic this was not a HSNO compliance issue.

Operation: Kumara

Date: June 2008

ERMA New Zealand received correspondence prior to the operation from two parties with concerns about potential contamination of a drinking water supply. After further consultation undertaken by the operator, the operation boundaries were changed.

Operation: Karamea

Date: June 2008

ERMA New Zealand received a copy of a claim for compensation for loss of business due to the 1080 operation in the area. The complainant claimed that their tourism business would be negatively impacted for the six-month period following the operation. The complaint was referred to the Animal Health Board (the agency funding the operation) who declined the claim.

Operation: Karamea

Date: July 2008

A member of the public submitted an appeal against a permission that had been issued. The complainant failed to establish grounds in Court and the case was dismissed.

Operation: Karamea

Date: July 2008

ERMA New Zealand received a complaint that notification signs had been removed prior to the six months specified in the HSNO controls. An investigation by an enforcement officer from the local Public Health Unit found that the signs were removed prior to six months, but that the operator had met the alternative requirement to monitor baits and carcasses and remove signs after they were found to be no longer toxic. However, the operator had not given prior notification to the Health Protection Officer before removing the signs, and was warned to comply with this requirement in the future.

Operation: Kumara

Date: July 2008

The Police investigated an allegation that a dog belonging to a member of the operator's staff was deliberately poisoned by 1080 in the back of a marked utility vehicle parked in a supermarket. The Police reported that they were unable to determine fault, as they considered it possible that residues from 1080 pellets might have been present in the vehicle from the operator's work activity.

Date: August 2008

Operation: Kaiata

ERMA New Zealand received information that misapplication of 1080 had killed deer on private land. An investigation by an enforcement officer from the local Public Health Unit and an internal investigation by the operator found there had been a miscommunication between an occupant of the land and the person who was consulted by the operator. This miscommunication had resulted in the deer being let into a treated area. The complainant was advised of the outcome of the investigation.

Operation: Taipo

Date: August 2008

ERMA New Zealand received a complaint that the operators were not using the correct safety gear. This was passed on to the Department of Labour, whose investigation did not find any non-compliance. The complainants were advised of the outcome of the investigation.

Operation: Taipo

Date: August 2008

ERMA New Zealand received a complaint that the operation was not complying with transport regulations. This complaint was passed on to the Police Commercial Vehicle Investigation Unit, which did not find any non-compliance. The complainants were advised of the outcome of the investigation.

Operation: Taipo

Date: February 2009

ERMA New Zealand received a complaint regarding alleged non-compliance with permission conditions for the operation, which was referred to the Public Health Unit. The operator responded to the Public Health Officer and complainant.



**Region: Otago**

Operation: Northern Blue Mountains

Date: July 2008

ERMA New Zealand received a complaint that the conditions of permission had been breached where bait stations were visible from a walking track. An investigation by an enforcement officer from the local Public Health Unit found that the operator had not breached requirements as the stations had not contained baits, but the operator was given advice on the placement of bait stations.

Operation: Mt Stalker

Date: August 2008

ERMA New Zealand received a complaint that requisite public notice of an operation had not been given. An investigation by an enforcement officer from the local Public Health Unit found that the operator had complied with notification requirements. The complainant was advised of the outcome of the investigation.

Operation: Mt Stalker

Date: August 2008

ERMA New Zealand received a complaint that there was bait on a walking track contrary to the conditions of permission to carry out the operation. An investigation by an enforcement officer from the local Public Health Unit found that the operation had complied with the condition to inspect tracks. The complainant was advised of the outcome of the investigation.

## | 5 RESEARCH

In its 2007 decision on the reassessment of 1080, the Environmental Risk Management Authority stressed the importance of more research into adverse effects and alternative methods of pest control, and sought Government support to develop a research programme.

This section provides information on research related to 1080 use that occurred prior to July 2009. Many of these projects are ongoing, as the collection of data over an extended period will be necessary to draw informed conclusions. There are three distinct areas of research:

- alternatives to the use of 1080;
- improvements to the use of 1080; and
- other research related to 1080 use.

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### Alternative toxins

This research can be divided into three sections: extending the use of substances already in use in New Zealand; seeking registration in New Zealand for toxins with established use overseas; and consideration of new toxins.

#### *Extending the use of toxins already in use in New Zealand*

Cholecalciferol – an alternative to 1080 for aerial application?

AHB ref: R-50691 and R-50691-01

Contracted by: Animal Health Board

Carried out by: Pest Control Research

Researchers considered whether a toxin and bait type other than 1080 could be used in aerial operations that covered gorse and blackberry. Several bait types (cereal pellets, block baits and aerodynamically shaped bait stations) were evaluated. Field trials commenced in June 2009. Cereal pellets were dropped into dense bush canopy to determine which baits had the best penetration. These trials are ongoing, however preliminary results indicate that cereal baits containing cholecalciferol may be a suitable alternative to 1080 for aerial application.

#### A re-evaluation of potential rodenticides, for aerial application

DoC ref: 3440

Contracted by: Department of Conservation

Carried out by: CE Research Associates

Researchers sought to identify an existing rodenticide that could be aerially applied as an alternative to 1080. The review outlines the advantages and disadvantages of various rodenticides, and their suitability for aerial application. The authors concluded that diphacinone is the logical first choice as an alternative to 1080 for rodents, followed by cholecalciferol. The Department Of Conservation has made the review available online:  
<http://www.doc.govt.nz/upload/documents/science-and-technical/drds312entire.pdf>

#### Environmental fate of toxicants used for mouse, rat and possum control

DoC ref: 3863

Contracted by: Department of Conservation

Carried out by: Pest Control Research.

Researchers seek to determine the breakdown rates of toxic baits in the field, and to use this information to calculate potential effects on target and non-target species. Toxic baits containing either cyanide, cholecalciferol, coumatetralyl or diphacinone were exposed for 12 months to weather at two climate extremes: MacKenzie basin (dry) and Westland (wet). Monthly samples will now be analysed for toxin concentrations.

**Diphacinone and coumatetralyl persistence in deer**

DoC ref: 4128

Contracted by: Department of Conservation

Carried out by: Connovation Ltd

Researchers are gathering information about the effects on non-target species from residues of sub lethal doses of substances which may be considered for use as alternatives to 1080 for aerial application. Three deer were sub-lethally dosed with diphacinone and three deer sub-lethally dosed with coumatetralyl. Residue analysis is underway, with the proposed analysis to be completed late in 2009.

**Diphacinone persistence in livestock**

DoC ref: 4029

Contracted by: Department of Conservation

Carried out by: Connovation Ltd

Researchers are gathering information about the potential residues of diphacinone in non-target species if it is used as an alternative to 1080 for aerial application. Ten pigs and five cattle were sub-lethally dosed with diphacinone. Residue analysis is underway, with the analysis proposed to be completed late in 2009.

**Extending the registration of Feratox to include the control of wallabies**

DoC ref: DM 211555

Contracted by: Department of Conservation, Regional Councils and Connovation Ltd

Carried out by: Connovation Ltd

Researchers sought to provide data to support extension of the registration of cyanide pellets to include wallabies as a target species so that the pellets could be used as an alternative to 1080. Pen and field trials were undertaken to provide safety and efficacy data. The data showed that the cyanide pellets killed wallabies effectively and humanely. This project was carried out to provide data to support registration of Feratox as an alternative to 1080 for dama wallaby control.

**Cyanide pellets for the control of ferrets**

AHB ref: R-80690

Contracted by: Animal Health Board

Carried out by: Connovation Ltd

Researchers seek to provide data to support an application to extend the registration of cyanide pellets as an alternative to 1080 for the control of ferrets. Pen and field trials have been undertaken to provide safety and efficacy data. Technical difficulties with ferrets rejecting cyanide have caused delays. Field trials are planned to continue in 2009.

**Cyanide pellets for the control of feral pigs**

AHB ref: R-80689

Contracted by: Animal Health Board

Carried out by: Connovation Ltd

Researchers sought to provide data to support an application to extend the registration of cyanide pellets as an alternative to 1080 for the control of pigs. Pen and field trials have been undertaken to provide safety and efficacy data. Technical difficulties with pigs rejecting the cyanide have caused delays. Field trials are planned to continue in 2009.

**Updated Toxicology Review Paper on 1080**

AHB ref: R-80704

Contracted by: Animal Health Board

Carried out by: Lincoln University

Researchers have undertaken to produce an updated peer review of publications on 1080. They will produce a toxicology review paper for an internationally recognised journal and prepare a publicly available and accessible short article. The work is currently undergoing peer review. The researchers intend to finish this project late in 2009.

**Low dose cholecalciferol baits for possum control**

AHB ref: R-80706

Contracted by: Animal Health Board

Carried out by: Connovation Ltd

Researchers seek to produce a less expensive and safer formulation of cholecalciferol bait that is still effective for controlling possums. Cage trials were carried out to provide safety and efficacy data, indicating that the new formulation is effective in killing possums. Field trials are scheduled for 2009/10.

**Establishing baseline concentrations of cholecalciferol in animals**

Contracted by: Department of Conservation

Carried out by CE Research Associates

Researchers seek to establish baseline levels of cholecalciferol in animals in order to distinguish between natural concentrations and any raised concentrations in poisoned non-target species. This project summarises the literature on concentrations of cholecalciferol in animals, birds, reptiles and fish. Researchers will now look at whether this information can be extrapolated to establish likely concentrations in New Zealand wildlife (including native species and game species); and consider how best to sample and determine reference concentrations of cholecalciferol in key native species.

***Seeking registration in NZ for toxins currently used overseas*****Registration of microencapsulated zinc phosphide for possums**

AHB ref: R-60628

Contracted by: Animal Health Board

Carried out by: Pest Tech Ltd and Connovation Ltd

This study provided data for the registration of microencapsulated zinc phosphide (MZP) through the New Zealand Food Safety Authority and ERMA New Zealand approval processes. New Zealand Food Safety Authority approval was granted in October 2008. ERMA New Zealand pre-screening has been completed and an application for approval has been submitted to ERMA New Zealand.

**Cereal bait with zinc phosphide for possums**

AHB ref: R-60628-02

Contracted by: Animal Health Board

Carried out by: Pest Tech Ltd and Connovation Ltd

Researchers seek to develop cereal baits using zinc phosphide and progress this through to registration in New Zealand. Work commenced June 2009 and is ongoing.

**Smart pest control**

Contracted by: Foundation for Research Science and Technology

Carried out by: Lincoln University

Researchers are seeking to improve bait acceptability to multiple species (possums, rats and mice) using a new formulation of bait containing zinc phosphide and cholecalciferol. Field trials compare 1080 with a new formulation of this bait by using bait stations tied together and cameras with passive infrared sensors to capture animal choice. Researchers have established that the new multi-species baits out-perform existing baits containing 1080 in palatability to possums, rats and mice. The research is expected to be completed in 2009.

**Consideration of new toxins****PAPP trials – an alternative control toxin for cats and stoats**

DoC ref: 3932

Contracted by: Department of Conservation

Carried out by: Connovation Ltd

Research was carried out to provide data to support an application for registration of the new red blood cell (RBC) toxin PAPP for control of stoats and feral cats. Four PAPP field trials tracked stoats and feral cats in Southland, North Canterbury and Ngamatea Station. Results show that after five nights of PAPP baiting, tracking rates for stoats were down to 10 -16 percent and that PAPP had killed over 80 percent of feral cats. Registration for PAPP is being pursued with applications filed to New Zealand Food Safety Authority and ERMA New Zealand.

**Humane red blood cell toxins for possums**

AHB ref: R-80701

Contracted by: Animal Health Board

Carried out by: Connovation Ltd

Researchers seek to develop and test new toxins that are humane and do not cause secondary poisoning of dogs. Caged trials with possums are underway using two potential new toxin compounds. Research is ongoing.

**New Zealand-based plant toxins**

Contracted by: Nga Pae o Te Maramatanga (Auckland University)

Carried out by: Lincoln University

Research is being carried out to identify potential new toxicants in New Zealand plants. Researchers are working with Ngai Tahu to identify toxic plants and to develop new toxicants as potential alternatives to 1080.

**Humane red blood cell toxins for feral pigs**

Contracted by: Regional Councils and Connovation Ltd

Carried out by: Connovation Ltd

Researchers seek to develop and test new toxins for feral pigs that are humane and do not cause secondary poisoning of dogs. Pen trials have been completed and good efficacy data was obtained. Field trials are planned.

**Humane red blood cell toxins for rodents**

Contracted by: Connovation Ltd

Carried out by: Nga Pae o Te Maramatanga (Auckland University)

Researchers seek to develop a novel rodenticide. PAPP analogues are being synthesised and tested. The research is ongoing but some toxins have shown promising results.

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## Biocontrol

There are two streams of work being carried out by the National Research Centre for Possum Biocontrol (NRCPB). One focuses on agents that affect fertility in possum and the other focuses on the development of possum-specific toxins. The current four-year programme finishes in October 2009.

More information can be found online at: <http://possumbiocontrol.agresearch.co.nz/>

### Susceptibility of South Island possums to W6 virus infection

AHB ref: R-30638-01

Contracted by: Animal Health Board

Carried out by: AgResearch

Researchers tested the possum enterovirus W6 strain on South Island possums. Possums caught in the wild were taken to an animal facility and checked for virus neutralising antibodies. The possums were fed bread containing the W6 virus and monitored for 30 days. This study found South Island possums were less susceptible to the virus than those in a previous North Island study. Further trials may look at whether the infectivity of the virus decreased when cultivated in the lab and whether natural transmission in vivo is more effective.

### New possum-specific toxins

AHB ref: R-30553-04 and R-40553-05

Contracted by: Animal Health Board

Carried out by: AgResearch and Otago University

Researchers seek to find a possum-specific toxin that could result in bait that targets possums without affecting other species. Possum thyroid cells were cultured and exposed to chemicals that could activate a known physiological response unique to possums. None of the chemicals activated the response in possums. However findings indicate there is potential for developing possum-specific toxins in the future.

### Mobile element mediated transgenesis in nematodes

AHB ref: R-80717

Contracted by: Animal Health Board

Carried out by: La Trobe University

Researchers seek to develop a nematode that can be used as a vector to deliver a biocontrol agent to possums. This research aims to find a way to produce 'transgenic' nematodes. DNA is injected into the gonads of nematodes and the nematodes are then screened to establish whether this DNA is passed onto the next generation. Preliminary analysis of new nematode strains suggests that they are significantly healthier and more fertile than previous strains. Further work is planned over the next few years.

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## Research into new methods of trapping

New traps may reduce the need for aerially applied 1080 to control rats and stoats.

### Self-setting stoat and rat trap

Contracted by: Department of Conservation

Carried out by: Goodnature Ltd

The Department of Conservation is funding the ongoing development of new self-setting traps to reduce the cost of labour-intensive operations in remote locations and reduce reliance on aerial application of 1080. It has developed a self-resetting trap, which kills, clears and resets itself 12 times before requiring human intervention. The tree-mounted trap has a CO<sub>2</sub> powered piston which is triggered when the target pest enters the trap. Instantaneously the head is crushed and the dead animal falls to the ground as the trap resets. The trap is baited with a long-life meat derivative lure. It is specifically designed to work with stoats and rats. The projected 92 percent reduction in labour costs for trapping operations will enable field workers to undertake trapping control programmes over larger areas for the same cost.

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## Research into possum vaccines

Possoms are the primary wildlife reservoir of bovine tuberculosis (TB) in New Zealand. Possoms are controlled on areas of forest that border farmland to prevent the transmission of TB from possums to livestock. The following project looked at whether a vaccinated buffer could act as a 'social fence' of immunised possums that could prevent the movement of infected possums to farmland.

### Vaccinated buffers for managing possums in forest areas

AHB ref: R-10699

Contracted by: Animal Health Board

Carried out by: Landcare Research

A trial was carried out to explore the option of using vaccination of possums as an alternative to aerial application of 1080 for creating 'buffer areas' to manage TB in infected possums.

GPS collars were used to monitor movements or 'reinvation rates' of adult possums in two areas of mixed beech forest in the Kaimanawa Range over 12 months. One area had no possum control (emulating a vaccinated buffer of resident animals) and the other area was next to a strip where the possum population had been reduced to very low levels by 1080 poisoning (a poisoned buffer).

Possoms in the uncontrolled buffer zone moved shorter distances than those in the area next to the poisoned buffer zone (where possum numbers were at very low levels). This indicates that buffers could be narrower if vaccination was used. This is because an in situ population of resident possums in a buffer appears to reduce 'home range creep' and dispersal movements of possums from further back in the forest. The next step is to repeat this research on juvenile possums, because they move further before settling in a new location.

More information can be found online at: [www.landcareresearch.co.nz/publications/newsletters/posnews/kararehekino14.pdf](http://www.landcareresearch.co.nz/publications/newsletters/posnews/kararehekino14.pdf)

### Research status update: orally-delivered Bacille Calmette-Guerin (BCG) vaccine

Contracted by: Animal Health Board

Carried out by: Landcare Research

Researchers sought to establish whether an orally delivered Bacille Calmette-Guerin vaccine could be used to protect possums from TB. Possums were trapped and orally vaccinated with the TB vaccine Bacille Calmette-Guerin. Vaccinated and control possums were re-trapped bimonthly and assessed for TB status; the site was depopulated after two years and post-mortem examinations were conducted.

Significantly fewer culture-confirmed TB cases were recorded in vaccinated possums (1/51) compared with control animals (12/71). Vaccine efficacy was estimated at 95 percent for females and 96 percent for males.

Results have been published in Proceedings of the Royal Society B 2987-2995, 276; 2009

## Improvements in the use of 1080

### *Reducing amounts of 1080 used*

When baits containing 1080 are applied aerially, a broadcast pattern is typically used to spread bait uniformly across the treatment area. Ongoing research and the use of GPS technology have reduced the amount of bait used from 25 kilograms per hectare in the late 1970s to as little as 2 kilograms per hectare using current methods.

In the three projects below, researchers studied whether 1080 bait sown in lines or clusters could still be effective in reducing possum numbers. The idea was to drop clusters of bait and see if the possums would come and find them. These poison clusters would act like a ground bait station but be delivered aerially, using GPS technology to pinpoint locations. This would avoid dropping 1080 into waterways, and potentially reduce the total amount of bait applied. By sowing in clusters, researchers also wanted to see if they could use less bait, and test the effect of 'pre-feeding' the possums with non-toxic food in these same locations.

#### Using less 1080 and sowing in clusters

AHB ref: R-10629

Contracted by: Animal Health Board

Carried out by: Landcare Research

Researchers sought to test how to use less 1080 without reducing effectiveness. Treatment blocks with high and moderate numbers of possums were treated with 8 gram cereal baits containing 1080 using either aerial broadcast (at 2.5 kilograms per hectare); or using 60 percent less of the same cereal bait (1 kilogram per hectare) sown in clusters of 30-40 baits spaced 30 metres apart along helicopter flight paths. The clustering was achieved using a sowing bucket modified with a new gated paddle-wheel that is able to sow specific numbers of baits at the desired interval. Results showed that sowing 60 percent less bait in clusters may be as effective in controlling possums as broadcasting it at the usual rate of 2.5 kilograms per hectare.

More information can be found online at:

[www.landcareresearch.co.nz/publications/newsletters/possnews/kararehekino14.pdf](http://www.landcareresearch.co.nz/publications/newsletters/possnews/kararehekino14.pdf)

#### Using less 1080, cluster sowing and pre-feeding

AHB ref: R-10710

Contracted by: Animal Health Board and Department of Conservation

Carried out by: Landcare Research

Researchers sought to establish whether the 1080 sowing rate could be reduced by 92 percent without compromising effectiveness. Following on from the previous project, this trial reduced the amount of 1080 sown by 92 percent (0.25 kilogram per hectare instead of 3 kilograms per hectare). Researchers used cluster sowing and pre-feeding. It was found that sowing less toxic bait in clusters was effective in controlling possums provided pre-feeding using the same flight path was used.

More information can be found online at:

[www.landcareresearch.co.nz/publications/newsletters/possnews/kararehekino14.pdf](http://www.landcareresearch.co.nz/publications/newsletters/possnews/kararehekino14.pdf)

#### Achieving multi-pest control by pre-feeding with non toxic baits

DoC ref: 3884

Contracted by: Department of Conservation

Carried out by: Department of Conservation

Researchers sought to study the effects of pre-feeding on possums and ship rats. Pests were pre-fed with 1 kilogram per hectare non-toxic cereal bait and broadcast-sowed 2 kilograms per hectare 1080 baits. This approach was found to be effective in reducing both possum and ship rat numbers. The next stage of the research will involve assessing whether the rebound in rat numbers is due to breeding of residual survivors or movement of rats from other areas.



**Effect of pre-feeding and 1080 concentration on bait acceptance by house mice**

DoC ref: 3889

Contracted by: Department of Conservation and Foundation for Research Science Technology

Carried out by: Landcare Research

An investigation was carried out to see whether pre-feeding and toxin concentration affect the acceptance of 1080 pellet baits by mice. Mice caught from the wild were presented with toxic (1080) and non-toxic pellets in two-choice laboratory feeding tests. The intakes of the food choices by mice, and any subsequent mortality, were measured over time. It was found that mice can rapidly identify food containing toxic concentrations of 1080 and subsequently will avoid it. This feeding response would partly explain the variable success of 1080 baiting operations against mouse populations.

***Effects on non-target species of the use of deer repellent***

The following two studies were used to assess the impact on non-target species of adding EPRO Deer Repellent (EDR) to cereal baits containing 1080. Based on information provided by these (and earlier studies), ERMA New Zealand approved the use of EDR on cereal baits in April 2009.

**Registration of deer repellent baits**

AHB ref: R-10697

Contracted by: Animal Health Board

Carried out by: Landcare Research

This project was established to gather data to support an application for the registration of deer repellent. Epro Deer Repellent coated cereal bait containing 0.15 percent 1080 was sown in the Blue Mountains Recreational Hunting Area, Otago. The project also involved pre-feeding with EDR coated (non-toxic) cereal baits. Researchers found fewer deer were killed (10 percent in total) than in 2001 (when 66 percent of the fallow deer population was found dead after an aerial 1080 operation in the same area).

**Non-target impacts on bird populations**

AHB ref: R-80696

Contracted by: Animal Health Board

Carried out by: Enviroresearch

Researchers sought to assess the impact on tomtits of the addition of EDR deer repellent additives to 1080 cereal bait. Tomtit mortality rates were examined during an aerial 1080 operation using deer repellent in northern Otago. Results indicate there is no greater mortality to tomtits when EDR additives are used. This supports the findings of similar studies in 2003 and 2005.

***Effects of aerially applied 1080 on kea populations***

Kea were monitored in conjunction with three aerial 1080 operations in 2008. All of the kea survived on two operations (12 birds monitored), but during the Fox/ Whaio 1080 operation seven of 14 monitored kea were found dead, six with 1080 in their stomach contents. Research is being done to determine ways of reducing effects on kea and determining the long term effects on populations.

AHB ref: R-80716

DoC ref: 4012

Contracted by: Animal Health Board and Department Of Conservation

Carried out by: Department of Conservation

Researchers seek to assess the effects of 1080 on kea. By radio-tagging kea at different sites throughout the South Island, researchers will monitor these birds throughout upcoming 1080 trials. Preliminary results showed no mortality of radio tagged birds after an aerial 1080 operation at Mt Arthur. Further trials are planned for late 2009 and 2011.

***Effects of possum control on trees***

The Department of Conservation is carrying out studies to help decide when and where control of possums is most beneficial for protection of native forests.

**Effects on kamahi**

DoC ref: 3886

Contracted by: Department of Conservation

Carried out by: Landcare Research

This research project was established to help the Department of Conservation make decisions about which possum control regime to use. The work involves measuring the effects on kamahi of different possum control regimes (those triggered by possum population levels or with set return times). The benefits and costs of the work are being compared. Early results show that although there is a clear relationship between the average level of browse and possum density, there is also a large amount of variation between tree species, years and sites.

**Meta-analysis of the tree canopy**

DoC ref: 3811

Contracted by: Department of Conservation

Carried out by: Landcare Research

This long-term project was established to help the Department of Conservation make decisions about which possum control regime to use. Researchers are analysing several data sets looking at canopy condition and tree survival under different possum control regimes—including no possum control and regimes with long return intervals. The data suggests it may be possible to test whether tree survival is greater at sites receiving possum control. A paper is being prepared for submission to an international journal in 2009.

**Quantifying gains in natural character**

DoC ref: 3670

Contracted by: Department of Conservation

Carried out by: Landcare Research

The Department of Conservation is seeking information for future possum control strategies. The project compares the condition of plants at sites that have been subjected to infrequent possum control (4 to 7 year frequency), no control, and frequent possum control. Results are not yet available.

**Operation Ark**

DoC ref: 3815

Contracted by: Department of Conservation

Carried out by: Department of Conservation

This project looks at whether one-off aerial 1080 baiting in mast years achieves control of rat and stoat plagues such that nesting success and survival of mohua and yellow-crowned parakeets is improved. (In 'mast' years, the beech trees produce high numbers of seeds and the rat, mice and stoat populations surge. In following years these pests switch their prey to birds.) A report on Operation Ark is expected in 2010/11.

**Local elimination: tracking and ground control as an alternative to repeat aerial sowing of 1080**

AHB ref: R-10669

FRST ref: C09X0507

Contracted by: Animal Health Board and Foundation for Research Science Technology

Carried out by: Landcare Research

This project seeks to cut back on repeated aerial 1080 sowing by researching other ways to check whether possums have been eliminated from an area. CTCs (Chew Track Cards which show possum foot or tooth impressions) have been used to map the distribution of possums following aerial 1080 baiting. VHF radio transmitter collars have been attached to possums to assess how pre-feeding affects the time possums spend foraging at or near pre-feed sites. Preliminary results show that CTCs are effective for identifying isolated groups of possums that survive aerial baiting which can then be 'mopped' up with ground-based control. Researchers also found that pre-feeding altered where possums spent their time and taught them to search in places likely to be baited.

Based on these findings, further studies are planned which may permit replacing repeated 1080 broadcast sowing operations with more localised baiting regimes. Ongoing trials are assessing perimeter control using long-life cholecalciferol gel baits. More information can be found online at:  
[www.landcareresearch.co.nz/publications/newsletters/possnews/kararehekino14.pdf](http://www.landcareresearch.co.nz/publications/newsletters/possnews/kararehekino14.pdf)

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## Other research

### Movement behaviour of 1080 poisoned possums

AHB ref: R-10703

Contracted by: Animal Health Board

Carried out by: Landcare Research

Researchers seek to determine the risk and magnitude of poisoned possums moving outside a poison operation (and becoming a risk for dogs and other non-target species). The movement of possums poisoned by 1080 was assessed by fitting them with radio transmitters. Interim results show the average possum moves between 48 and 83 metres after eating a lethal dose of 1080.

### *Modelling the probable concentrations of 1080 in water following aerial 1080 drops*

In its 2007 decision on 1080, the Authority recommended that research be undertaken into water biodegradation. The Animal Health Board considered that any effects of dilution far outweighed any biodegradation effects and contracted the National Institute of Water & Atmospheric Research (NIWA) to take an alternative approach to the issue, modelling the levels of 1080 that may get into drinking water supplies from aerial application of 1080.

### Determining levels of 1080 in drinking water

AHB ref: R-80713

Contracted by: Animal Health Board

Carried out by: National Institute of Water & Atmospheric Research (NIWA)

Trials are being conducted to determine the probable 1080 concentration that would be in a stream after an aerial application of 1080. This project uses modelling to assess the levels of 1080 that may get into drinking water supplies from an aerial drop. Initial results suggest that even under the worst-case scenario (of rain falling immediately after a 1080 operation), the long-term concentration of 1080 in a stream would be below the Ministry of Health drinking water guideline value. Validation and field experiments on stream flow and leaching of 1080 into soil are ongoing.

### OECD test 307: Aerobic transformation of 1080 in soil

AHB ref: R-10695

Contracted by: Animal Health Board

Carried out by: Landcare Research

Trials using methods described by OECD Guideline 307 and using radioactive labelled 1080 are being undertaken to determine the effects of temperature on 1080 in soil samples kept at 5, 10 and 20° Celsius. The project is expected to be completed in 2010.

***Effects on rongoa Māori*****Uptake of 1080 by watercress and puha**

AHB ref: R-80694

Contracted by: Animal Health Board

Carried out by: Lincoln University

Researchers sought to provide information to members of the Māori community on the uptake and elimination of 1080 in watercress and puha. Ten individual puha plants on the shores of Lake Waikaremoana were randomly selected and caged to prevent herbivore grazing. A single piece bait was placed in a small cage at the base of eight of these plants. Two non-toxic baits were placed at the base of two (control) plants. A similar method was used for watercress in a stream near Kaikoura. Tissue samples from the puha and watercress were collected over hours and days, snap frozen and analysed.

The results showed that both watercress and puha took up 1080. Puha eliminates 1080 within 38 days, and watercress eliminates 1080 within three days. Withholding periods are recommended after any aerial 1080 operation. Results also indicate that 1080 occurs naturally in puha.

**Information database about 1080 and taonga species update**

AHB ref: R-80667-02

Contracted by: Animal Health Board

Carried out by: Lincoln University

Researchers seek to make 1080 non-target information available for Māori communities. A database was set up in the 2005/06 year to organise and present information on 1080 non-target impacts. This has been updated every year, and has most recently been reformatted to be web-based and publicly available. Māori communities have been informed of this database through hui, Māori media and other established networks.

The database can be accessed at: [www.lincoln.ac.nz/1080](http://www.lincoln.ac.nz/1080)

## | 6 OTHER ACTIVITY

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### Minor amendments to the approval

Under section 67A of the HSNO Act, the Authority may amend an approval if it considers that the alteration is minor in effect or corrects a minor or technical error. Since notifying the decision on the reassessment of 1080 in August 2007, a number of minor errors in the decision document came to light. The following amendments were made.

- Insertion of an approval number for the peanut-based 1080 product.
- Reinstatement of the approved handler exception for pilots, which was previously included but omitted from the recent reassessment decision in error.
- Amendment of the signage control, to clarify that signage must remain in place either for a minimum of six months after the last date of application (of toxic bait), or until the substance and any carcass is no longer toxic, or until the substance and any carcass is retrieved.
- For control PG2 (page 17) the trigger level has been amended to read 0.5 kg/0.1L litre.
- The substances listed for P3 were incorrect under the headings given. This has been corrected so that all the substances covered by the P3/PS4 control are listed under PS4 only. In addition, the packaging requirements for limited quantities of certain substances are specified in controls PG2 and PG3 (page 17).
- The wording of the licence controls previously implied that only licensed sellers or suppliers of 1080 may purchase/acquire the substance. This control has been amended to clarify that any person purchasing or acquiring the substance must hold a license in accordance with Additional Control 5.
- Additional control 12 (page 27) previously made reference to "additional control 13". This reference has been deleted as there is no such control.

No changes have been made to the controls on the active ingredient (technical grade monosodium fluoroacetate).

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### New formulations of 1080

Any changes to the composition or proposed use of formulated substances containing 1080 must be notified to the Authority in writing before the new formulation is used.

In 2008 the Authority approved a new formulation for cereal pellets coated with EPRO deer repellent (EDR) after the applicant demonstrated that the EDR-coated pellets posed no additional risks. The Authority decided the EDR-coated pellets were covered by the existing approval for the equivalent non-coated 1080 pellets.





ENVIRONMENTAL RISK MANAGEMENT AUTHORITY



NGĀ KAIWHAKATŪPATO WHAKARARU TAIAO

20 Customhouse Quay  
PO Box 131  
Wellington  
New Zealand

Phone: + 64 4 916 2426  
Fax: + 64 4 914 0433

[www.ermanz.govt.nz](http://www.ermanz.govt.nz)

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