Environmental Protection Authority
Te Mana Rauhī Taiao

Annual Report on the Aerial Use of 1080

For the year ended 31 December 2010

New Zealand Government

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Executive summary

The functions and powers of the Environmental Risk Management Authority (ERMA New Zealand), including responsibility for monitoring and reporting on aerial 1080 operations, were transferred to the Environmental Protection Authority (EPA) on 1 July 2011. Accordingly, the EPA presents the fourth annual report on the aerial use of 1080 in New Zealand for operations conducted in the year ended December 2010 and research carried out to July 2011.

1080 is one of the most closely-monitored hazardous substances in New Zealand. This is the fourth annual report on the aerial use of 1080 since the controls on its use were tightened in 2007.

The Environmental Protection Authority received reports for 45 aerial 1080 operations in 2010, covering nearly 440,000 hectares. There were fewer aerial 1080 operations, covering less area than the previous two reports, but this is more likely to be due to the cycle of pest control operations than changes in use patterns.

In the last four years, we have seen progress through research, development of industry standards and better communication.

In 2010, 17 new research projects were commenced and 34 projects looking to improve practices and find alternative pest control methods continued. In addition, the National Possum Control Agencies published guidelines for the management of aerial 1080 operations, which should support further improvements in industry performance.

There were more incidents and complaints reported for 2010 (34, up from 17 in 2009). All were investigated and six instances of breaches of controls attributed to operator practices were found (up from three in 2009).

Sixteen breaches were caused by the actions of members of the public (up from three in 2009), some of which had the potential to create unacceptable risk to people and the environment.

The improvements that have been made are tempered by the breaches that continue to occur and there is no room for complacency. The EPA is committed to seeing further improvements in performance and will continue to monitor the use of 1080 and provide information on how the industry is performing.

Introduction

The reassessment of 1080 for use in pest control was completed by the Environmental Risk Management Authority (ERMA New Zealand) in August 2007. After careful consideration, the Authority concluded the benefits of using 1080 outweighed the adverse effects, and released its decision to allow the continued use of 1080 with additional controls. Recommendations were also made for the development of best practice guidelines and for further research.

In reaching its decision, the Authority was mindful that the use of 1080 was a polarising issue about which many New Zealanders have deeply held views. It recognised the importance of engagement through better communication and consultation with the public, local communities, Māori and special interest groups. The Authority's decision outlined a new management regime for 1080 operations.

This is the fourth annual report since the release of the reassessment decision. It provides information on:

» aerial 1080 operations that were carried out in the 2010 calendar year; and

» research that was carried out up until July 2011.

Sectors that use aerial application of 1080 for pest control

Control of animal pests including possums, wallabies, rabbits, rats and stoats is carried out using both ground control and aerial application.

Ground control may include methods such as trapping, shooting or placement of various toxins in bait stations. The toxins, or vertebrate toxic agents, may include 1080.

Aerial application is the use of aircraft to distribute baits. The ability to aerially apply 1080 is considered by users to be a key advantage where pest control is undertaken on rugged or remote land.

In her recently released report,[1] the Parliamentary Commissioner for the Environment also concluded that 1080:

» can kill possums, rats and stoats in one operation;

» can knock back predators for a time allowing populations of native species to increase;

» can be used quickly to protect birds and other animals at vulnerable times; and

» is more cost-effective than ground methods in the majority of the conservation estate.

Different users carry out pest control operations with aerially applied 1080 for different reasons. The sector groups that use aerial application of 1080 are:

» the Animal Health Board;

» the Department of Conservation;

» regional councils; and

» other land managers.

The Animal Health Board

The Animal Health Board is responsible for managing and implementing the National Pest Management Strategy for Bovine Tuberculosis (NPMS) in New Zealand.

The NPMS was approved by the Government in 1998 and amended in 2004. A further major revision commenced in July 2011. The NPMS provides for measures to control bovine tuberculosis (TB) in cattle and deer herds, and 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 2011 NPMS amendment introduces new objectives for the eradication of TB from possums and other wildlife species across 2.5 million hectares of the total

[1] Parliamentary Commissioner for the Environment, June 2011; ***Evaluating the use of 1080:*** *Predators, poisons and silent forests*

10.1 million hectares where wildlife infection is present. Eradication of TB from wildlife depends on sustained possum control to achieve low, even possum densities across large areas for long enough periods to break the cycle of possum-to-possum disease transmission.

The Animal Health Board uses a combination of ground control methods and aerially applied 1080 in its strategy for containing and controlling possums. The Animal Health Board's total area under sustained management is about 10.1 million hectares. Approximately 1.5 million hectares (15 percent) of the Animal Health Board's total area under sustained management is controlled using aerial application of 1080, with application typically being carried out at intervals of five to seven years. The remaining area under sustained management is controlled using ground-based trapping or poisonous baits, which is repeated annually or biennially.

In 2010, approximately 263,000 hectares were treated using aerial application of 1080 (8 percent of the total area treated by the Animal Health Board in 2010),[2] marginally less than the area reported in our previous annual reports.

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 manages approximately 8.75 million hectares of conservation land.[3] It uses a combination of ground control methods and aerial application of 1080 to:

- improve the health of ecosystems by reducing the impact of browsing, competition and predation by possums and rats;
- protect threatened species from predators through direct control and targeted by-kill;[4] and
- control rabbits.

The Department of Conservation's total area under sustained management is about 1.8 million hectares.[5] In 2010, approximately 623,000 hectares (35 percent) of this area was covered by animal pest control operations using both ground control and aerial methods (see Table 1). The Department of Conservation reported that of the 2010 total treatment area, approximately 161,000 hectares (26 percent) was treated using aerial application of 1080.

Table 1: Department of Conservation animal pest control treatment area

AREA UNDER SUSTAINED MANAGEMENT (000 HECTARES)			AREA CONTROLLED 2010 CALENDAR YEAR (000 HECTARES)		
Rabbit control	Possum control	Rodents and mustelids	Rabbit control	Possum control	Rodents and mustelids
473	839	487	30	274	319

[2] AHB annual report for the year ending 30 June 2010.
[3] Figures updated from information given for 2009, Pers com, Department of Conservation, August 2011.
[4] This is where scavenging pests are being controlled using secondary poisoning.
[5] Not including the Chatham Islands and sub-Antarctic islands.

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 1993. Regional councils achieve these responsibilities through:

- local regulation (such as regional pest management plans);
- incentive and education schemes; and
- direct (regional council managed) control.

Where regional councils directly control animal pests, they use a combination of ground control methods and aerial application of 1080. This control reduces the impact 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 two million hectares and control pests over about 800,000 hectares annually.[6] In 2010, these councils reported aerial applications of 1080 that covered approximately 5,000 hectares (0.6 percent) of the estimated annual treatment area.[7]

Other land managers

Farmers and land managers (such as Land Information New Zealand) use a combination of aerial application of 1080 and other rabbit control methods (such as shooting, ground-laid poisons) to reduce the effects of rabbits. This is done to meet the requirements of regional pest management plans, or for production purposes.

In some areas, referred to as rabbit-prone land, rabbit population increases are not curbed by natural mechanisms and numbers can quickly build to high levels, causing a number of environmental effects including:

- a reduction in the diversity of plant species;
- an increase in the risk of erosion;
- a reduction in soil quality; and
- adverse effects on indigenous and other fauna when predators of rabbits (such as cats and mustelids) target alternative prey.[8]

There are large areas of the South Island considered rabbit prone. Approximately 380,000 hectares are considered extremely rabbit prone, and approximately 630,000 hectares are considered highly rabbit prone. Most of these areas are in Otago, Canterbury and Marlborough.[9] In 2010, 1080 was aerially applied for rabbit control over approximately 9,000 hectares (2.4 percent of the extremely rabbit-prone land) in areas of Otago and Canterbury.[10] This is about half the size of areas reported for previous years.

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.

[6] Data for regional councils as at 2006.

[7] This does not include work done for the control of rabbits on behalf of other land managers.

[8] See www.ecan.govt.nz/advice/your-land/plant-animal-pests/managing-animal-pests/pages/rabbits.aspx

[9] Lough, RS 2009. *The Current State of Rabbit Management in New Zealand* MAF Biosecurity Contract Report, Wellington.

[10] No aerial 1080 operations for rabbit control were reported for Marlborough in 2010.

Application information

The pest management cycle for an area under sustained management spans several years. Every year parts of the area will be controlled by different methods 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 2 shows a comparison between the data for total treatment areas over four years (2006 to 2010). This data provides a snapshot of the sizes of the areas treated by aerial application in the current year and does not necessarily indicate a trend.

Table 2: Animal pest control treatment area (000 ha)

	AHB	DOC	REGIONAL COUNCILS	OTHER LAND MANAGERS		TOTAL AREA
				RABBIT	POSSUM	
2006 Aerial treatment area (1080)	396	127	61[11]	-	-	580
2008 Aerial treatment area (1080)	435	133	3	16	11	600
2009 Aerial treatment area (1080)	309	174	11	17	-	510
2010 Aerial treatment area (1080)	263	161	5	9		438
2006 Total treatment area	5,004	136	800	-	-	5,900
2008 Total treatment area	3,630	260	-	-	-	3,900
2009 Total treatment area	3,404	430	-	2,431[12]	-	6,300
2010 Total treatment area	3,294	633	-	2,431[12]	-	6,358

A dash (-) signifies that there was no data available.

The Animal Health Board conducts aerial 1080 operations over a considerably larger total area, and aerially applies more 1080 than any other user. At the same time, the Animal Health Board used aerial 1080 over a relatively small proportion of its total treatment area (8 percent of the total treatment area being via aerially applied 1080).

This reflects the fact that a significant proportion of the Animal Health Board's treatment area includes farmland, with aerial 1080 being used on the fringes. In comparison, a significant proportion of Department of Conservation pest control occurs in more difficult forested terrain, resulting in more (26 percent) of the Department of Conservation's pest control being carried out using aerially applied 1080.

[11] Some Animal Health Board co-funded operations were included as regional council operations in 2006.

[12] Estimate based on an assumption that rabbit control takes place on land that has a rabbit-prone classification of "medium", "high" or "extremely high" (data sourced from Lough, 2009).

Best practice guidance

The reassessment decision for 1080 included recommendations that management practices for aerial application be standardised around best practice to ensure national consistency and further improve the way 1080 is used.[13]

Best practice guidelines 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.

Communication and management of aerial 1080 operations were identified as the two key priorities for the development of best practice guidance.

Communication

The *Communications Guideline for Aerial 1080 Operations* was published in March 2009 and is available on our website at: www.epa.govt.nz/about-us/monitoring/1080/

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

Monitoring adherence to these guidelines is undertaken when people apply for permission to undertake an aerial 1080 operation (see the Communication section on page 12).

Management of aerial 1080 operations

The National Possum Control Agencies (NPCA) led a project to develop standardised industry-wide guidelines for the management of aerial 1080 operations. The guidelines, which were published in April 2011, are available on the NPCA website at: www.npca.org.nz

The guidelines are a high-level document outlining the matters that need to be addressed once a decision has been made to undertake an aerial 1080 drop. The focus is on risk management at all stages of an aerial 1080 operation, which includes:

- the pre-operational planning, consultation and obtaining of consents and permissions;
- the practical preparation for carrying out the drop;
- the aerial 1080 operation itself; and
- the post-operational monitoring, communication and reporting.

[13] ERMA New Zealand's Decision on the reassessment of sodium fluoroacetate (1080) and substances containing 1080: August 2007.

Aerial pest control operations

This section is divided into three parts. The first provides a synopsis of the data brought together through the mandatory post-operational reporting of information about the management of an aerial 1080 operation, including a communication overview and assessment of outcomes. The second looks at monitoring data collected. The third section provides a synopsis of the reported incidents and public concerns, and how the enforcement agencies and operators responded.

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
  - species monitoring, if it was carried out in conjunction with the operation;
- 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 our website at: www.epa.govt.nz/about-us/monitoring/1080/

Post-operational reports

Operation management

The Environmental Protection Authority received reports for 45 aerial 1080 operations in the 2010 calendar year, covering approximately 440,000 hectares. The majority of this area was treated by the Animal Health Board (59 percent) and the Department of Conservation (37 percent). The remaining area was treated for rabbit, possum and wallaby control by regional councils and other land managers.

Of the reported operations:

- 16 were funded by the Animal Health Board;
- 11 were funded by the Department of Conservation;
- 1 was co-funded by the Department of Conservation and the Animal Health Board;
- 2 were funded by regional councils (one of which was for wallaby control); and
- 15 were funded by other land managers for rabbit control.

There were 19 fewer aerial 1080 operations in 2010 (64 in 2009) over a treatment area approximately 14 percent smaller (438,000 hectares versus 510,000 hectares for 2009). The Department of Conservation's number of aerial 1080 operations decreased (12 in 2010 versus 18 for 2009) and the Animal Health Board's also decreased (17 in 2010 versus 28 for 2009). Both organisations reported a lower percentage of their total treatment areas having been controlled using aerial application of 1080. This should be considered in the context of the total area under sustained management of each organisation, and may indicate where each organisation is in their treatment cycle, rather than a change in treatment methods.

The 1080 formulations applied and application rates

The majority (29) of the aerial possum and/or rodent control operations used 1080-laced cereal baits with a concentration of 1.5 grams of 1080 per kilogram of bait. Carrot baits were only used on part of one possum control operation, with cereal baits used on the other treatment blocks in the operation. Deer repellent coated cereal baits were used in six of the possum control operations, with no deer repellent carrot baits reported as having been used.

All rabbit control operations reported using carrot baits laced with 1080 at the rate of 0.2 grams per kilogram of bait. The difference in the toxic concentration rate between rabbit and possum baits reflects the differences in susceptibility and feeding patterns of rabbits and possums.

Bait application rates for possum and rodent control operations varied between 0.17 and 3 kilograms of bait per hectare, with rates for rabbit control varying between 10 and 30 kilograms of bait per hectare. The difference in application rates reflects the differences in pest numbers and feeding patterns between target species.

Despite the differences in toxic concentrations and application rates, the average application rate of the active ingredient (1080) was similar for both rabbit and possum control operations. The average active ingredient application rate for possum control operations was approximately 2.9 grams of 1080 per hectare. It was 4.5 grams per hectare for rabbits. This data is comparable to that reported for previous years with both application rates being well within the maximum allowable rate of 30 grams of 1080 per hectare.

Location of operations

The number of aerial 1080 operations in each region, and the sectors using 1080, varies depending on the purpose of the operation, topography and land cover (see Table 3).

In 2010, the regions with the largest number of aerial 1080 operations were the West Coast and Otago. However, the reasons 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 possum and rodent control programmes. In Otago, all the aerial 1080 operations were carried out for rabbit control and covered relatively small areas.

Table 3: Aerial 1080 operations in each region (2008–2010)

REGION[14]	ANIMAL HEALTH BOARD			DEPARTMENT OF CONSERVATION			REGIONAL COUNCILS[15]			OTHER LAND MANAGERS RABBIT & POSSUM			TOTAL AERIAL OPERATIONS EACH REGION (NUMBER)			AERIAL APPLICATION EACH REGION (000 HA)[16]		
Year	**08**	**09**	**10**	**08**	**09**	**10**	**08**	**09**	**10**	**08**	**09**	**10**	**08**	**09**	**10**	**08**	**09**	**10**
Bay of Plenty	1	1	1	-	-	-	-	-	-	1	-	-	2	1	1	47	11	4
Canterbury	1	1	-	1	1	-	-	-	1	9	12	5	11	14	6	26	24	9
Hawke's Bay	5	5	3	-	-	-	-	-	-	-	-	-	5	5	3	52	79	24
Manawatu/ Wanganui	5	-	-	3	2	1	-	-	-	-	-	-	8	2	1	56	41	3
Marlborough	3	3	2	-	1	-	-	-	-	-	-	-	3	4	2	59	28	26
Northland	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	2	-
Otago	2	3	-	-	3	-	-	-	-	5	4	10	7	10	10	13	38	5
Southland	-	-	-	1	-	1	-	-	-	-	-	-	1	-	1	8	-	25
Taranaki	-	-	-	1	-	1	1	-	-	-	-	-	2	-	1	2	-	35
Tasman	4	2	-	3	2	-	-	-	-	-	-	-	7	4	-	80	64	-
Waikato	5	2	3	1	3	2	2	1	1	-	-	-	8	6	6	64	30	75
Wellington	1	2	1[17]	-	-	-	-	1	-	-	-	-	1	3	1	3	19	29
West Coast	14	9	7	4	5	6	-	-	-	1	-	-	19	14	13	183	175	204
TOTAL	**41**	**28**	**17**	**14**	**18**	**11**	**3**	**2**	**2**	**16**	**16**	**15**	**74**	**64**	**45**	**600**	**510**	**438**

A dash (-) signifies no operations reported.

Size of operations

The total area of combined pest control operations carried out in 2010 is estimated to be more than 6.3 million hectares.[18] Within the 438,300 hectares treated by aerial application, the average size of aerial applications was about 10,000 hectares, with the largest application covering just over 48,000 hectares and the smallest 60 hectares. This is comparable to the sizes of operations previously reported.

The size of the operation can depend on the purpose and location of the operation. The Department of Conservation and the Animal Health Board mostly carry out aerial 1080 operations to control possums and other predators over larger tracts of land.

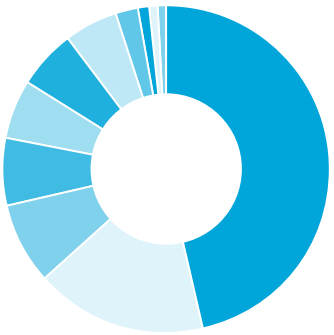
Bigger operations can increase the time it takes pest numbers to rebuild since fewer pests migrate into the heart of the treated areas. The average size of aerial 1080 applications was 14,600 hectares for the Department of Conservation and 15,900 hectares for the Animal Health Board.

In comparison, the average size of aerial 1080 rabbit control operations undertaken by other land managers was 603 hectares.

Although Otago and Canterbury had comparatively large numbers of operations, the majority were small operations for rabbit control, resulting in small total areas treated compared with other regions (Figure 1). This is consistent with the 2009 findings.

[14] There were no aerial 1080 applications reported for the Auckland region.
[15] Does not include operations co-funded with other land managers.
[16] Totals have been rounded to the nearest thousand. There were 438,300 hectares treated by aerial application in 2010.
[17] Combined operation between the AHB and DoC.
[18] There is an additional unknown total area for privately funded ground-based animal pest control.

Figure 1: Total area of aerial application in each region – 2010 (000 ha)



West Coast	204	Hawke's Bay	24
Waikato	75	Canterbury	9
Taranaki	35	Otago	5
Wellington	29	Bay of Plenty	4
Marlborough	26	Manawatu/ Wanganui	3
Southland	25		

Communication

Good communication can reduce public concern and result in a reduction in incidents. The Environmental Protection Authority 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.

The Environmental Protection Authority is advised about communication concerns in three ways:

» members of the public are able to advise the Environmental Protection Authority of their dissatisfaction with communication by operators during consultation and notification;

» operators include objections as part of their post-operational reporting; and

» agencies that have issued permissions may find problems with communication processes when they audit these permissions.

Where the information provided suggests that a breach of controls has occurred, the Environmental Protection Authority passes this information on to enforcement agencies for them to investigate.

The number of reported concerns is down from previous years and suggests ongoing improvements in communication.

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 in 77 percent (23 out of 30) of the aerial operations that took place on public land in 2010. This represents a continuing improvement in the rate of consultation with Māori groups since 2008. Changes to operational plans as a result of consultation with Māori groups were not specifically identified for most operations. However, one operation included monitoring of shellfish as a result of consultation with Māori.

Consultation with hunting groups

Hunting groups should be engaged as early as possible when an aerial 1080 operation is to be carried out on public land where hunting is prevalent and likely to be affected by an application. Early engagement of these groups is especially important in areas that are recreational hunting areas,[19] and where commercial harvesting of animals for meat is prevalent.

Hunting groups were identified as having been consulted in 60 percent (18 out of 30) of the operations that took place on public land in 2010.

[19] The eight recreational hunting areas are Pureora, Kaimanawa, Aorangi, Lake Sumner, Oxford, Whakatipu, Blue Mountain and Kaweka.

This represents a continuing improvement in the rate of consultation with these groups since 2008. Consultation with hunting groups resulted in seven operations where deer repellent baits were used, and changes to baiting strategies or timing to reduce the impact on hunting opportunities were reported in other operations.

Changes to operations as a result of consultation

Changes to operations as a result of consultation are considered an indicator of whether the consultation was effective. Twenty-six of the post-operational reports for the 2010 year included comments about changes to the operational plan as a result of consultation, including:

- boundary changes as a result of consultation (11 operations);
- changes as a result of concerns expressed by local iwi (two operations), including monitoring of species and exclusion of sensitive areas;
- changes to timing to allow for others to manage effects (such as changes to stock grazing, granting hunting permits) (six operations);
- the method of pest control was changed from aerial application of 1080 to ground control for parts of an operation (four operations); and
- deer repellent was used (seven operations).

Notification

Notification takes place after consultation is completed. The purpose of notification is to inform affected parties of the timing and location of 1080 operations and other relevant details. Notification of certain types of incidents is also required.

Concerns about notification were forwarded to the Environmental Protection Authority from operators, agencies or members of the public for six of the 45 aerial 1080 operations carried out in 2010. All of the concerns were investigated and two breaches were found.

Implementation of the Communications Guideline for Aerial 1080 Operations

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. Prior to granting a permission for an aerial 1080 operation, Public Health Units assess consultation against the *Communications Guideline for Aerial 1080 Operations*.[20] The Ministry of Health reports the results of these assessments to the Environmental Protection Authority.

The Ministry of Health reported that 65 applications for aerial 1080 operations were assessed against this guideline in 2010. Of the 65 applications, 62 met the requirements of the guideline and three operators were required to undergo further consultation to meet the standard in the guideline. No permission was declined as a result of inadequate consultation in 2010.

No deficiencies were found in the pre-operational communication process as a result of later investigations.

Monitoring

Water monitoring

Where drinking water supply sources water from within the boundaries of an aerial 1080 operation, the local Public Health Unit may require water monitoring to be carried out before reconnecting water intakes. This is done to ensure that drinking water does not contain 1080 residues that breach the tolerable exposure limit (3.5 micrograms of 1080 per litre of water).

[20] See www.epa.govt.nz/about-us/monitoring/1080/Pages/Best-practice.aspx

Water monitoring may also be required in other water catchments as part of environmental monitoring for resource consents or carried out for research purposes. It may also be used to provide evidence of effects on water where Public Health Units are investigating concerns about alleged water contamination.

Post-operational water monitoring was carried out on 14 of the aerial 1080 operations undertaken in 2010, with 122 tests reported. The tests had a method detection limit of 0.1 micrograms of 1080 per litre.

There was no 1080 detected in any samples taken as part of environmental monitoring, or as part of post-operational water monitoring in drinking water catchments.

The Parliamentary Commissioner for the Environment stated in her 2011 report *Evaluating the use of 1080: Predators, poisons and silent forests* that:

"We do not need more water samples to tell us that the way 1080 is used poses no real risk to water."

The evidence to date seems to support this conclusion; nevertheless, it should be noted that water testing is frequently carried out to allay community concerns around the perceived risks to water supplies from aerial application of 1080. It is likely that testing will continue to be used by operators and regulatory bodies as a tool to demonstrate risks do not exist in the specific circumstances of an operation.

Species monitoring

The monitoring of plant and animal species is carried out to determine the need for pest control operations and their success. Species monitoring is not a mandatory requirement for 1080 operations, but where monitoring is carried out, operators must report the results to the Environmental Protection Authority.

Pre-operational monitoring of pest species was carried out on 34 (75 percent) of the aerial 1080 operations undertaken in 2010. All rabbit control operations were monitored prior to aerial operations; eight (73 percent) Department of Conservation operations had pre-operational monitoring of pest species, and eight (47 percent) Animal Health Board operations were monitored for pest numbers prior to control.

Post-operational monitoring of pest species was carried out on 29 (64 percent) of the aerial 1080 operations in 2010. For all monitored operations, the operators reported meeting their stated target results for pest control.[21]

Monitoring of non-target species was carried out on 13 operations to determine the effects of 1080 on them. Species monitored included dogs, kea, kaka, tomtits, native trees, native snails and native birds. This monitoring is often done as part of the research into the use of 1080 and is summarised further in the research section of this report.

Incidents and public concerns

The use of 1080 continues to attract significant public concern and opinion remains deeply divided on its use.

The Environmental Protection Authority is advised of complaints, incidents and activities associated with 1080 use in three ways:

- The public registering their concerns – a member of the public contacts the Environmental Protection Authority to express concerns about particular 1080 operations or related practices.
- Incident reporting – an operator or agency contacts the Environmental Protection Authority to express concerns about particular 1080 operations or related practices.
- Media monitoring – we learn through our media monitoring service of incidents or concerns reported in the news.

[21] Target results vary based on methods of monitoring and are included in the post-operation reports available on the EPA's website: www.epa.govt.nz/about-us/monitoring/1080/

This information is assessed to determine the required response and is passed on to enforcement agencies where there are concerns that need to be investigated. When a person asks for a complaint to be noted (rather than for action to be taken) this information is filed against the operation in question.

Incidents related to specific operations are reported in post-operational reports. The reports for the 2010 operations are available on our website at: www.epa.govt.nz/about-us/monitoring/1080/

Overview of incidents and public concerns

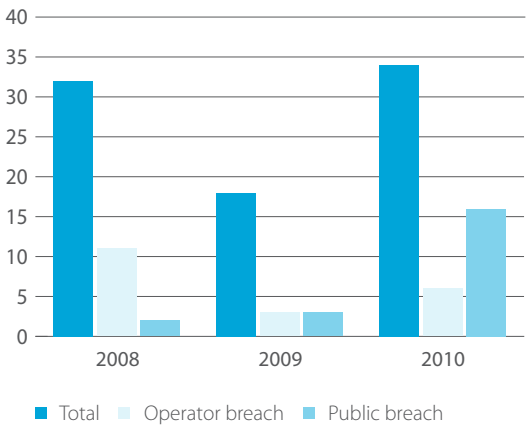
There were 34 incidents and concerns reported to the Environmental Protection Authority for 2010, comparable to 2008[22] (Figure 2).

All reports were investigated and revealed:

» some reduction in the overall number of breaches[23] by operators since 2008 (11 in 2008, three in 2009 and six in 2010); and

» an increase in breaches by the public (16 for 2010, up from three breaches in 2009 and two in 2008).

Figure 2: Incidents and public concerns reported to the EPA[24]



Although the increase in incidents caused by the public may be due to more consistent reporting (rather than an increase in actual incidents) several types of the incidents that occurred are of particular concern:

» members of the public endangering workers and themselves by unlawfully entering operational sites and attempting to interfere when helicopters are operating and 1080 is being handled;

» members of the public trying to inconvenience operators by removing warning signs from operational areas and in doing so endangering companion animals and others;

» members of the public removing 1080 baits from the operational area; and

» threatening and violent behaviour from members of the public towards people involved in the operations.

Incident summaries

The next section contains information on the incidents, objections and compliance issues reported to the Environmental Protection Authority, which relate to aerial 1080 operations in 2010 (by region – north to south).

[22] The Environmental Protection Authority started recording complaints and incidents in 2008.

[23] A breach is a non-compliance with HSNO controls, or other legal requirements. Not all investigations revealed breaches.

[24] The total number of incidents and public concerns is more than the combined breaches shown. Not all investigations revealed breaches.

WAIKATO

Operation: 2010 East Taupo

Date received: July 2010

A fake bomb was found on a vehicle at the operator's depot. The Police bomb squad was called and the device was detonated. The 'bomb' contained cereal pellets, which were tested and found to have been homemade non-toxic baits. The Police investigated but were unable to find the person responsible.

Operation: 2010 East Taupo

Date received: July 2010

In three separate incidents, members of the public alleged that dogs (three dogs in total) had died as a result of 1080 poisoning from carcasses or pellets in the operational area (a private forest) and that there was no warning signage. None of the dogs were available for testing to determine whether 1080 poisoning was the cause of death. The allegations of non-compliance for each of the allegations (signage deficiencies) were investigated by an enforcement officer of the local Public Health Unit and found to be unsubstantiated. The investigation also found that entry to the forest was by permit only, with permits stating that 1080 had been laid in the area. At least one permit also prohibited the permit holder from taking dogs into the area.

Operation: 2010 North Waikato

Date received: November 2010

A member of the public alleged her cat had been poisoned by eating birds affected by the 1080 operation. The operator was contacted and sent samples to be tested for 1080 residues. The tissue samples for the cat and bird were positive for 1080. The member of the public also alleged breaches of permission conditions, which were investigated by the Public Health Unit and found to be unsubstantiated.

Operation: 2010 Karioi

Date received: December 2010

The operator was contacted by a vet clinic with a dog they suspected had been poisoned by 1080. This occurred prior to the application of 1080, but the operator elected to have tissue from the dog tested to prove the dog was not poisoned by 1080. The samples were taken by the vet and sent off for independent analysis. No 1080 was detected in any of the samples.

BAY OF PLENTY

Operation: 2010 Whirinaki Rata

Date received: January 2011

Three separate protest incidents were related to this operation:

- A member of the public threatened to shoot down helicopters involved in the application of 1080. The Police investigated and the offender was prosecuted.
- Several members of the public breached the cordon surrounding the 1080 loading area. Once inside, they abused staff and removed warning signs. The Police kept the peace and gave a warning to a protestor who was throwing rocks.
- Protesters blocked an access road for the operational area. Police mediated a solution between the protestors and local iwi who asked the protestors to leave.

TARANAKI

Operation: 2010 Egmont

Date received: March 2010

An enquiry received from the media concerned an allegation by a member of the public that helicopters had flown over her house during the operation. The allegations were passed on to an enforcement officer of the local Public Health Unit for investigation. Although the complainant subsequently withdrew her complaint, the enforcement officer continued the investigation and found the pilot had neither breached the buffer zone imposed around dwellings nor any permit conditions.

Operation: 2010 Egmont

Date received: April 2010

The operator alleged that a weed spraying contractor working in the area had removed 1080 from the operational area. The allegations were passed on to an enforcement officer of the Department of Labour for investigation. The investigation concluded that the person who removed the baits failed to comply with the requirement to have a controlled substance licence for possession of 1080. The person was issued with a compliance order.

Operation: 2010 Egmont

Date received: April 2010

The operator reported that a landowner in the vicinity of the operation had contacted them because their pet dog had eaten a possum carcass which had been found on their property. The owner was advised to seek treatment for the dog, but it subsequently died. No samples were taken to confirm 1080 poisoning, but the operator conceded 1080 was likely to have been the cause of death. As a result of the dog's death, the operator checked nearby areas for carcasses and provided further notification to people living in the area.

HAWKE'S BAY

Operation: 2010 Timahanga

Date received: November 2010

The operator was at the site inspecting signage when he came across several people working on tracks in the area. When he stopped and talked to the workers, one of them admitted he had removed baits from the area to show to others. The operator advised the worker that he was not allowed to possess the baits without a controlled substance licence. The person later surrendered the baits to the operator. The incident was reported to the local Public Health Units, Police and ERMA New Zealand. No further action was taken.

MARLBOROUGH

Operation: 2010 Northbank

Date received: October 2010

An enforcement officer from the local Public Health Unit identified that the operator had failed to meet a permission condition to place a public notice in a specified newspaper. The enforcement officer gave the operator a written warning.

Operation: 2010 Northbank

Date received: October 2010

1080 pellets were found in the Renwick Department of Conservation office car park. The Police investigated, but the offender was not found.

WEST COAST

Operation: Grey Valley West

Date received: April 2010

The operator received a report of stock deaths from a person who owned land within the vicinity of a ground control operation. The landowner believed 1080 was responsible for the deaths. Tissue samples and stomach content samples were taken and tested. No 1080 was detected.

Operation: Protest activity (Greymouth)

Date received: May 2010

About 30 small green pellets were left outside the West Coast Conservancy office in Hokitika. The incident was reported to the Police and the pellets were tested for 1080. The pellets were found to be non-toxic. No further outcome was reported.

Operation: 2010 Cascade Hope

Date received: June 2010

A mechanical failure on a sowing bucket resulted in baits being spread outside the treatment area. The baits were not in an area where harm was likely to occur; however, the misapplication was not reported to all of the required authorities within the statutory timeframe. The operator was given a warning by an enforcement officer of the local Public Health Unit.

Operation: 2010 Mikonui North and South

Date received: June 2010

Four separate protest incidents took place during this operation:

- Several protesters blocked access to the operational site in an attempt to disrupt the operation. Police attended and reminded protestors of their obligations to ensure free access along public roads.
- Members of the public removed warning signs, which had to be replaced. This was reported to the Police and the local Public Health Unit, but investigations failed to find the people responsible.
- A member of the public alleged the operator had sown baits into the Ross water supply catchment. The allegations were investigated by an enforcement officer of the local Public Health Unit, who found the flight lines for the operation were not consistent with the allegations. Police undertook a further investigation to determine how the pellets ended up in the water supply. No further outcome was reported.
- A member of the public advised the operator that baits had been misapplied onto a road in the operational area. The baits were found by the person prior to the 'first inspection' of the road (as required by the Public Health Unit's permission). The road was subsequently inspected and cleared by the operator in accordance with Public Health Unit's conditions.

Operation: 2010 Mikonui North and South

Date received: June 2010

The operator reported a misapplication to the appropriate authorities where a helicopter had flown off line by 12 metres on a boundary of the operation. Although the bait was applied over a boundary, the application was within the areas for which consents had been obtained. No further action was taken.

Operation: 2010 South Westland

Date received: July 2010

Four separate protest incidents were related to this operation:

- Several members of the public used vehicles and people to block the main highway at night in an attempt to disrupt the operation. An unlit vehicle pulled out of a side road into the path of a truck transporting bait.

This caused the truck to take emergency action to prevent a collision. The Police intervened to give the vehicles access along the road and prosecuted the driver of the unlit vehicle.

» Several members of the public breached a security cordon to reach the operational area and delay the planned drop. Police arrested five protesters under the Trespass Act and Biosecurity Act.

» Members of the public removed warning signs, which needed to be replaced. This was reported to the Police and the local Public Health Unit, but investigations failed to find the people responsible.

Operation: 2010 South Westland

Date received: July 2010

An enforcement officer from the local Public Health Unit reported a complaint of possible breach of permission conditions when 1080 baits were alleged to have been found in the water supply catchment. The allegations were investigated by the enforcement officer, who found that the baits were outside the exclusion zone and there was no breach of conditions by the operator.

Operation: 2010 Moeraki, Whakapohai and Mataketake

Date received: July 2010

The operator reported two misapplications, where the flight lines showed the helicopter had flown off line in the operation. The operator reported the misapplication to the appropriate agencies. No further action was reported.

SOUTHLAND

Operation: 2010 Waitutu

Date received: April 2011

On the day of the 1080 application, a member of the public became aggressive and demanding. The person was removed from the operational area. No further action was reported.

Operation: 2010 Waitutu

Date received: April 2011

The operator submitted the report outside regulatory reporting timeframes. The operator was reminded of reporting requirements. No further action was taken.

Research

This section provides updated information on research related to 1080 use that took place prior to 1 July 2011. 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.

Many of the research projects described below are ongoing, as the collection of data over an extended period is necessary to draw informed conclusions. We have prefaced the title of each research project with the words "new" or "update" to indicate whether the project started in the period covered by this report, or is an update on a previously reported project. A summary of the projects is in Table 4 (below).

Table 4: Summary of research projects in this section

	NEW PROJECT	PROJECT UPDATE
Alternatives to the use of 1080 (6 new, 17 updates)		
Alternative toxins		
Extending the use of toxins already in use in New Zealand	1	11
Seeking registration in New Zealand for toxins currently used overseas	2	-
Consideration of new toxins	3	6
Biocontrol	-	1
Trapping	-	1
Improvements in the use of 1080 (10 new, 10 updates)		
Reducing amounts of 1080 used	2	3
Effects on non-target species of the use of deer repellent	2	-
Effects of aerially applied 1080 on bird populations	3	5
Effects of possum control on trees	2	2
Local elimination	1	-
Other research (1 new, 7 updates)		
Animal welfare	-	3
Small mammal control	-	2
Modelling concentrations of 1080 in the environment following aerial application	1	1
Effects on rongoa Māori	-	1

For more information about these research projects, see:

» Animal Health Board (AHB): http://tbfree.ahb.org.nz/Default.aspx?tabid=117

» Department of Conservation: www.doc.govt.nz/publications/science-and-technical/products/series/doc-research-and-development-series/archive/

» Connovation Ltd: www.connovation.co.nz/

» Landcare Research: www.landcareresearch.co.nz/publications/newsletters/possnews/

Alternatives to the use of 1080

This section includes research into the use of alternative toxins, biocontrol agents, new traps and vaccines.

Research on alternative toxins

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

Extending the application of toxins already in use in New Zealand

Update: Cholecalciferol – an alternative to 1080 for aerial application?

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

An outcome of the 2008 AHB project (R-50691) was that cereal baits containing cholecalciferol (KOLEE) were considered to be a possible suitable alternative to 1080 for aerial application. A registration application for the bait was made to the Ministry of Agriculture and Forestry, and the Environmental Protection Authority has decided grounds exist for a reassessment to consider aerial application. A field trial to determine the efficacy of aerially applied KOLEE is being planned for winter 2011 and it is expected this project will be completed by November 2011, but no application for a reassessment has been filed.

Update: Optimising the combination of cholecalciferol and aspirin

AHB ref: R-10657-02

Contracted by: Animal Health Board

Carried out by: Landcare Research

To improve the use of cholecalciferol for possum control by establishing the minimum concentration that, in combination with a synergist and masking additives, is palatable and effective. Results suggest that the combination is potentially highly cost-effective and is expected to improve the humaneness of controlling possums with cholecalciferol baits.

This project has been completed and reported to the Animal Health Board.

Update: Low dose cholecalciferol bait for possums and multi-species control

AHB *ref: R-80706*

Contracted by: Animal Health Board

Carried out by: Connovation Ltd

A new formulation of Feracol, containing less cholecalciferol, was shown to kill possums effectively and humanely. This project has been completed and HSNO approval was obtained in February 2011. Registration dossiers have been lodged with the New Zealand Food Safety Authority.

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

DoC ref: 3863

To determine toxin breakdown of baits containing diphacinone (RatAbate Paste) and coumatetralyl (Racumin Paste) and estimate potential risks to non-target species. A report is expected to be completed in late 2011.

Update: Diphacinone and coumatetralyl persistence in deer

DoC ref: 4128

To determine the effects on deer from residues of sub-lethal doses of diphacinone and coumatetralyl. Three deer were sub-lethally dosed with diphacinone and three with coumatetralyl. Research is now complete and results will be published in the Proceedings of the European Vertebrate Pest Management Conference in 2011 and in peer reviewed journals in 2012.

Update: Diphacinone persistence in livestock

DoC ref: 4029

To determine the potential residues of diphacinone in non-target species. Residue analysis has been completed and results will be published in the Proceedings of the European Vertebrate Pest Management Conference in 2011 and in peer reviewed journals in 2012.

Update: Extending the registration of Feratox to include the control of Bennett's wallabies

Contracted by: Connovation Ltd in association with Ecan
Carried out by: Connovation Ltd and Ecan

To provide data to support the registration of Feratox as an alternative to 1080 for the control of Bennett's wallabies. Field work was completed in June 2010. Registration documents have been filed with the New Zealand Food Safety Authority. The research has also been published in two journals.

Update: Cyanide pellets for the control of ferrets

AHB ref: R-80690

To extend the use of cyanide pellets to control ferrets. Field trials have been completed, but while cyanide is more humane than other toxins, ferrets avoided the cyanide so further development of cyanide-based products was not continued. This project has been completed.

Update: Cyanide pellets for the control of feral pigs

AHB ref: R-80689

To extend the use of cyanide pellets to control pigs. Field trials have been completed, but while cyanide is more humane than other toxins, pigs avoided the cyanide so further development of cyanide-based products has ceased. This project has been completed and sodium nitrite is now being pursued as an alternative toxin for pigs (and possums).

Update: Updated toxicology review paper on 1080

AHB ref: R-80704

A toxicology review paper was submitted to the *New Zealand Journal of Ecology* 35 (1).

Update: Establishing baseline concentrations of cholecalciferol in animals

Department of Conservation and Lincoln University

To establish baseline levels of cholecalciferol in animals to distinguish between natural concentrations and any raised concentrations in poisoned non-target species. A publication will be submitted to a journal before the end of 2011 after additional baseline data has been collected on pigs.

New: Vertebrate pest decision support system (VPDSS)

Envirolink ref: LCRX 0704
Contracted by: Ministry of Science and Innovation
Carried out by: Landcare Research Ltd

To provide a wide range of users with advice on the most appropriate options, including 1080, for the control of possums, rats, stoats, ferrets and feral cats. The VPDSS uses answers given to a series of questions about the proposed control operation, systematically evaluates the potential constraints that may be operating in the area, and provides the user with best practice advice and other information about recommended options. The VPDSS is available at: http://pestdss.landcareresearch.co.nz/

Seeking registration in New Zealand for toxins currently used overseas

New: Underpinning zinc phosphide use in New Zealand

AHB ref: R-80628-04

Contracted by: Animal Health *Board*

Carried out by: CE Research Associates

To complete a review paper for a peer reviewed science journal that comprehensively covers all key areas of chemistry, toxicology, ecotoxicology, environmental toxicology and fate, non-target impact, and efficacy and welfare of zinc phosphide relevant to use in New Zealand.

New: Development of a solid bait containing zinc phosphide

AHB ref: R-80628-05

Contracted by: Connovation Ltd

To develop a cereal bait containing zinc phosphide. Initial cage trials have been completed and further cage and field trials are planned in 2011-12.

Consideration of new toxins

This research covers the innovation of new toxins as alternatives to 1080.

Update: PAPP trials – an alternative control toxin for cats and stoats

DoC ref: 3932

The new red blood cell toxin para-aminopropiophenone (PAPP), for the control of stoats and feral cats, was the first new vertebrate pesticide registered for 30 years. This project has been completed (see Section 7).

Update: Humane red blood cell toxins for possums

AHB ref: R-80701-01

Cage and field trials of humane new toxins have been successfully completed. Research is ongoing and dossiers have been submitted for registration with the New Zealand Food Safety Authority and for approval by the Environmental Protection Authority.

Update: Secondary poisoning trials with humane red blood cell toxins for possums

AHB ref: 80701-02

Cage trials with sodium nitrite have shown it does not cause secondary poisoning of dogs, cats or birds. This project has been completed and dossiers on these studies will be used to assist registration. A publication will be submitted in 2012.

Update: Humane red blood cell toxins for feral pigs

Regional councils and Connovation Ltd

Pen trials of humane new toxins for feral pigs that do not cause secondary poisoning of dogs have been completed and efficacy data was obtained. This contract has been completed. Further research is underway to complete registration dossiers.

Update: Humane red blood cell toxins for rodents

Connovation Ltd

The research is ongoing and some novel candidate rodenticides have been identified.

Update: Pest control for the 21st century

MSI ref: LINX 0902
Contracted by: Ministry of Science and Innovation
Carried out by: Lincoln University, Connovation Ltd, University of Auckland and University of Otago

To enhance stoat and rodent control. The research targets a new generation of rodenticides based on methaemoglobinaemia, natural toxins and carbon monoxide releasing molecules, and seeks to extend the utility of PAPP in predator control. Welfare has been confirmed through national and international collaboration. Results underpinning the registration of new toxins for animal pest control are being generated in 2011. Registration of PAPP for stoats has been achieved and registration for feral cats is pending. New pest control products, including toxins, baits, lures and delivery systems are being researched for rodents, stoats, ferrets and feral cats.

New: Staying proactive and reducing non-target risk

AHB ref: R-80683-01
Contracted by: Animal Health Board
Carried out by: CE Research Associates

To clarify New Zealand-based non-target research and testing requirements for new vertebrate toxic agent product registrations for possums and TB vectors.

New: Aerial application of a new toxin in solid bait for possum control

AHB ref: R-80701-03
Contracted by: Animal Health Board
Carried out by: Connovation Ltd

To advance an alternative to 1080 for aerial control by completing cage trials on a new solid bait containing sodium nitrite and completing field trials to generate efficacy data for possums. Initial cage trials have been completed and further cage and field trials are planned in 2011-12.

New: Completing the arsenal for possums and TB control

MSI ref: LIN1003
Contracted by: Ministry of Science and Innovation
Carried out by: Lincoln University, Connovation Ltd, University of Auckland, AUT/Lincoln Venture

To advance sodium nitrite and zinc phosphide as backups to 1080 and develop solid baits using these toxins for possum control, together with the first new resettable delivery system for discrete toxin delivery. Enhanced best practice techniques are being implemented with new tools in an ecosystem context.

Biocontrol

Two streams of work were carried out by the National Research Centre for Possum Biocontrol (NRCPB). One stream focused on agents that affect fertility in possums and the other on the development of possum-specific toxins. More information can be found online at: http://possumbiocontrol.agresearch.co.nz/

Update: Possum fertility control

FRST ref: C10X0501 OBI 10051-ECOS-AGR
Contracted by: Foundation for Research Science and Technology
Carried out by: Landcare Research

Fertility control vaccines were developed and trialled and shown to be able to stimulate antibodies in female possums. The results, while promising, were not sufficiently effective for field use as fertility control agents in wild possum populations and further improvements were required. The potential of a replication-limited recombinant vaccinia virus (recVV) was assessed. When recVV was applied on possums (to simulate eating bait), a single dose elicited an immune response in most animals. The next step will be to modify the virus and study the long-term fertility and immunity responses.

This technology shows potential for the delivery of fertility or disease control vaccines to wild possums and vertebrate pests such as wallabies, stoats and rabbits.

Research into new methods of trapping

Update: Self-setting stoat and rat trap

Department of Conservation

A trap has been developed and is now being tested by Department of Conservation staff.

Improvements in the use of 1080

Reducing amounts of 1080 used

Update: Low-cost aerial baiting

AHB ref: R10710

High possum and rat kills have been achieved using cluster sowing of 1080 bait at rates as low as 167 grams per hectare. These results have led to setting operational specifications for Department of Conservation (rat-focused) and Animal Health Board (possum-focused) aerial baiting. These new specifications are to be replicated in multiple operations in 2011 and 2012. If successful, these specifications will be refined further. A final contract report will be submitted to the Animal Health Board in September 2013.

Update: Halving the cost of ground control

AHB ref: 10721

To reduce the cost of ground control and make it more competitive with aerial operations by:

1) determining the efficacy and costs of using aerially sown pre-feed baits followed by ground application of 1080 and cholecalciferol baits;
2) developing an ultra-low-cost detect-and-eliminate approach combining control, monitoring and proof-of-freedom possum surveillance for scrubby farmland; and
3) identifying patch size and density below which TB cannot persist and therefore identify areas which would not require control.

Objectives 1 and 2 are ongoing and objective 3 has been completed. The results suggest approximately three possums need to be present and in contact (that is, have overlapping home ranges) for a probability of 0.01 that TB will persist at a prevalence of 2 percent. When the probability of persistence is increased to 0.05, 10 possums per patch are needed, some of which will have overlapping home ranges. A final contract report will be submitted to the Animal Health Board in December 2013.

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

DoC ref: 4914

To measure rates of repopulation by rats after aerial 1080 operations. A database now holds repopulation data for 26 case studies which cover a variety of operations in various ecological contexts. The data will shape managers' expectations with respect to windows of relief from rat predation on threatened species when aerial 1080 is used. The data will also help develop computer simulation models which will be constructed over the next year. In addition, project 4194 has funded further experimentation on sowing rates and bird repellent.

Results have been submitted at various seminars and workshops and a manuscript will be prepared by June 2012.

Update: Better aerial baiting systems and strategies

AHB ref: R-10727

Contracted by: Animal Health Board

Carried out by: Landcare Research

To design, manufacture and field test a prototype sowing bucket for aerial GPS-controlled baiting at low application rates. The GPS-controlled bucket has been further refined and is being used operationally. The software has been modified to shut off automatically when approaching an exclusion zone. A contract report will be submitted to the Animal Health Board at the completion of the project in June 2013.

New: Effect of rat interference on possum kill during aerial 1080 poisoning

AHB ref: R-10729

Contracted by: Animal Health Board

Carried out by: Landcare Research

To determine whether the presence of high rat numbers reduces the percentage of possums killed when 1080 bait is aerially applied at much lower rates than current practice. In four areas, rat populations were experimentally reduced by 16 to 75 percent to test whether possum kills would be highest in the area with the fewest remaining rats. However, after aerial 1080 poisoning at just 0.25 kilograms per hectare, no possums were detected in any block. The second stage of this project has started with rat populations experimentally reduced in three of four areas. A contract report will be submitted to the Animal Health Board at the completion of the project in 2012.

Update: Can thermogenic compounds mitigate welfare costs in possums poisoned with 1080 by decreasing time to death?

AHB ref: R-10723

Contracted by: Animal Health Board

Carried out by: Landcare Research

To determine in laboratory trials whether oral co-administration of thermogenic compounds could improve the welfare of possums during 1080 poisoning by decreasing signs of illness or time to unconsciousness and death. One compound produced significant increases in possum metabolic rate within a suitable time and a significant reduction in the time to death.

Trials in 2010 identified the concentrations of the compound in cereal bait that were acceptable to possums and also resulted in increases in metabolic rate after ingestion. These results are encouraging for development of a low-cost additive to 1080 baits with the potential to improve the welfare of poisoned possums. Further trials are being conducted to determine whether voluntary ingestion of bait containing the compound and 1080 together decrease the time to death. Results were reported to the Animal Health Board in July 2011.

Update: Mouse behavioural resistance to 1080

Contracted by: Foundation for Research Science and Technology
Carried out by: Landcare Research

To test whether a micro-encapsulated 1080 formulation would delay absorption so that mice would eat a lethal dose. Data from an initial trial confirmed this material did not impair palatability or affect uptake compared with the RS5 1080 pellets alone. The result was 100% mortality (compared with ~25 percent from earlier formulations). Further trials were conducted and pre-feeding with a non-toxic surrogate increased the efficacy of 1080 bait against mice, particularly in the day following presentation. The results will be submitted as a manuscript for a publication by the end of 2011.

Effects of aerially applied 1080 on bird populations

Update: Effects on kea populations

AHB ref: R-80716, DoC ref: 4012

To:

1) measure the survival of kea under a new baiting protocol designed to minimise risk;
2) measure nest survival and age-specific survival for kea with respect to predator control including 1080; and
3) conduct census counts of adult female kea within a defined study.

No kea deaths occurred at two 1080 operations (Mt Arthur and Hawdon Valley) where the new protocol was followed. A further 40 to 45 keas will be tracked during winter–spring 2011 at Okarito and Wangapeka.

Twenty-two kea nests were monitored in untreated areas in Westland and South Westland. Nest survival was 41percent in South Okarito Forest, which is to be treated with aerial 1080 early in the 2011 nesting season. South of Fox Glacier, nest survival was 24 percent. In the final year of the study, further nests will be monitored in both the treated and untreated areas to measure the effect of the predator control resulting from the 1080 drop. Nest cameras have revealed possums and stoats are the major predators.

A census count was completed at Rotoiti where the kea population declined from 10 to 3 females between 1999 and 2011 in the absence of predator control. In the Hawdon Valley, where aerial 1080 was used twice in the last five years and stoats were trapped, preliminary results indicated the density of adult female keas was about 10 times that of Rotoiti.

Manuscripts are in preparation and submission and publication is anticipated by June 2012 for some parts, and by December 2012 for the Westland nest survival study.

Update: Operation Ark

DoC ref: 3815

To:

1) assess and improve the effectiveness of best practice stoat and rat control in protecting endangered forest birds, such as the mohua (yellowhead) and yellow-crowned parakeets, in beech forests; and
2) determine ecological damage thresholds for the impact of rats and stoats on endangered birds in beech forests.

Through the research and its interaction with the management of pest control operations in Operation Ark sites in the South Island, a range of pest control strategies have been developed for beech forests. Stoats, rats, mice and beech seed fall are monitored closely to inform decision making. Stoat traps are laid out according to the topography of the area. There is a well-defined timetable and protocol for rat control operations. Rats are controlled only during beech mast years using aerially applied 1080, which is the most cost-effective solution for large areas, and poison bait (a variety of types), which is used for small operations and those where there is insurmountable public opposition.

Update: Safety of use of pre-feed in aerial 1080 possum control for tomtit populations

DoC ref: 4140
Contracted by: Department of Conservation
Carried out by: Department of Conservation

To monitor tomtit survival during pre-feed operations. Bird counts are conducted before and after 1080 operations. Moreporks and kaka have been fitted with radio transmitters and are monitored using fixed-wing aircraft. Measurements are to be made at two sites in 2011.

Update: Ecological outcomes for birds of aerial 1080 baiting for pest control

DoC ref: 4116
Contracted by: Department of Conservation
Carried out by: Department of Conservation

To monitor bird population dynamics at three sites where predators are controlled by aerial 1080 application. Bird populations will be measured using song recorders and five-minute call counts. Focal species will be rifleman and possibly kaka. This project is scheduled for spring 2011.

Update: Protocols for and priority list of data-deficient bird species for 1080 mortality studies

DoC ref: 4143
Contracted by: Department of Conservation
Carried out by: Department of Conservation

Department of Conservation staff have developed protocols and priorities for quantifying bird mortality during an aerial 1080 operation. A draft manuscript has been prepared and will be submitted in 2011.

New: Long-term benefits of 1080 operations on South Island tomtits

AHB ref: R-80572-01
Contracted by: Animal Health Board
Carried out by: Ecological Networks Ltd

To determine the conservation benefit of a 1080 possum control operation on the South Island tomtit over several seasons. Surveys of bird numbers were undertaken in summer and winter between 2005 and 2009. A 1080 operation was conducted during winter 2008. Tomtit density decreased temporarily after the operation, before increasing significantly in the following breeding season. Tomtit populations were found to be higher in treatment areas than in non-treatment areas.

New: Effects of aerial 1080 operations on kea operations

AHB ref: R-80716
Contracted by: Animal Health Board
Carried out by: Department of Conservation

To create aerial 1080 operational specifications that are kea friendly and determine whether aerial 1080 operations lead to improved kea nesting success. Improved estimates of kea survival and recruitment will be used to predict the likely impact of long-term aerial 1080 programmes on kea numbers.

These predictions will be tested using a long-term series of population counts at selected sites where large-scale pest management regimes, including aerial 1080, are in place.

New: Comparative bait preference in captive kea

AHB ref: R-80744

Contracted by: RMB Consultants

To determine whether captive kea prefer RS5 or Wanganui No 7 cereal bait, and whether they prefer bait to which deer repellent has been added.

Effects of possum control on trees

Update: Meta-analysis of the tree canopy

DoC ref: 3811

To help Department of Conservation make decisions on which possum control regime to use. This project was completed in 2009 and is being prepared for submission to a journal in 2011.

Update: Quantifying gains in natural character

DoC ref: 3670

To assess the benefits of extensive possum control to 'conservation condition', which in this case was related to tree canopy health and mortality. The condition of plants at sites subjected to infrequent possum control (four to seven year frequency) was compared with no possum control and frequent possum control. Data from the three study sites (Coromandel, Haast and Northern Urewera) indicated high mortality for some palatable tree species at some untreated sites. Unpalatable tree species did not appear to be affected. The manuscript and report will be submitted by the end of 2011.

New: Ecological outcomes for plants from aerial 1080 operations

AHB ref: R-80733

Contracted by: Animal Health Board

Carried out by: Landcare Research

To determine the rate at which trees die under a regime of possum control using aerial 1080 compared with no control, by re-measuring tagged trees at Haast, Coromandel and Northern Urewera and analysing tree survival rates in blocks that have and have not received possum control.

New: Population dynamics of native wildlife at sites receiving aerial 1080 treatment to suppress predators

AHB ref: R-80734

Contracted by: Animal Health Board

Carried out by: Department of Conservation

To rigorously demonstrate the effect of repeated aerial 1080 use on a wide range of native wildlife, thus enabling a comprehensive assessment of its costs and benefits for native biodiversity.

Other research

Update: Welfare of wild deer – where does 1080 poisoning sit on a relative scale of welfare impact?

AHB ref: R-10722

Contracted by: Animal Health Board

Carried out by: Landcare Research

To study the humaneness of 1080 poisoning in deer, and its acceptability relative to other causes of mortality in deer.

This research could not be completed due to logistic and regulatory constraints that emerged, and no data was generated to address questions around the humaneness of 1080 poisoning in deer.

New: The cost-effectiveness of integrating bait stations and low-cost detection devices into possum maintenance control/proof-of-freedom programmes

AHB ref: R-10718

Contracted by: Animal Health Board

Carried out by: Animal Health Board and Hawkes Bay Regional Council

To determine the efficacy of integrating bait stations and detection devices into maintenance/proof-of-freedom programmes by determining the cheapest and most effective way of identifying the location of possums, and the most effective way to control them.

New: Deer repellent and 'spot' sowing effects on non-target species during aerial 1080 poisoning

AHB ref: R-10743

Contracted by: Animal Health Board

Carried out by: Landcare Research NZ Ltd

To determine whether the use of the Epro deer repellent and aerial 'spot' sowing of 1080 baits at low rates substantially change non-target risks by quantifying the impact on selected native bird species and deer. Study sites in the Hauhungaroa Range were identified for non-target monitoring during the planned aerial 1080 possum control operations in winter 2011. Tomtits were selected as a suitable keystone bird species to monitor at these sites. An integrated series of trials was designed in collaboration with the Animal Health Board to determine whether the use of cluster sowing and/or deer repellent was likely to result in an unacceptably large impact on native bird populations. These studies commenced in May 2011 and pre-control bird counts had been conducted in eight treatment blocks by the end of June 2011. The scale of the project was increased through operational funding to include bird count and carcass search monitoring and is now expected to be completed by September 2013. A final report to the Animal Health Board and a conference presentation are scheduled for November 2013.

New: Green Epro deer repellent (GEDR) use on RS5 cereal pellets

AHB ref: R-80568-07

Contracted by: Animal Health Board

Carried out by: Epro Ltd

To confirm the palatability to possums of GEDR on RS5 cereal pellets and the effectiveness of GEDR in repelling farmed deer from eating baits.

New: The palatability and efficacy of baits held in storage

Contracted by: Animal Control Products

Carried out by: Landcare Research

To assess the storage life of No. 7 and RS5 pellets by testing palatability, cinnamon content, 1080 content and efficacy (percent mortality achieved) of stored baits, at two-monthly intervals. Results so far available for tests at 0 and 2 months indicate baits meet the Agricultural Compounds and Veterinary Medicines specification for at least 90 percent efficacy. The study will be completed early in 2012.

Update: Small mammal control

Contracted by: Foundation for Research Science and Technology

Carried out by: Landcare Research

To:

1) reduce the cost of and the amount of 1080 bait sown during aerial 1080 rabbit control operations;
2) determine the extent to which anticoagulant residues are accumulating in wildlife; and
3) determine if rodents in New Zealand are developing genetic resistance to anticoagulants.

In the first year of this three-year project, previous research was reviewed in order to clarify the critical operational factors to field test, along with computer modelling of bait weight distribution and toxic loadings.

A literature review was published, papers presented at conferences and a web-based rabbit bibliography was developed. The bibliography is available at http://rabbits.landcareresearch.co.nz. For aims (2) and (3), samples of road-killed harrier hawks and rats are being collected and analysed for residues (hawks) and for the presence of genetic markers of resistance (rats).

Update: Fluoroacetate in tea – a source of human exposure?

AHB ref: R-10724

Contracted by: Animal Health Board

Carried out by: Landcare Research

Researchers evaluated existing data on fluoroacetate levels in tea and plants used for food and medicine and compared this with updated acceptable levels of exposure. Regular consumption of tea would not exceed the tolerable daily intake (TDI) of fluoroacetate concentrations. Based on current knowledge of the sublethal effects of fluoroacetate exposure in mammals, such consumption is not expected to pose a significant long-term risk to human health.

New: Strategic technologies for multispecies pest control

Contracted by: Ministry of Science and Innovation

To:

1) reduce the cost of aerial and ground control of possums and rats;
2) reduce the welfare and environmental impacts of pest control; and
3) reduce public opposition to pest control.

Research has progressed the re-engineering of fixed-wing aircraft for aerial application of 1080 bait in order to reduce flying costs by up to 60 percent.

Research related to reducing the cost of ground control has focused on:

a) testing and computer modelling of ground-based strategies that use single or multiple-capture traps;
b) measuring encounter and interaction probabilities using novel electronic proximity systems; and
c) developing wireless networks for remote monitoring of detection devices (still to start).

Research on aim (2) has been assessing the effect that a synergist with a currently registered toxin has on efficacy and welfare. If this research proves successful a new formulation will be available for ground control and potentially for aerial application. A working group has identified potential community groups to work with, which should result in improved dialogue and increased involvement of communities in pest management decision making. Two conference presentations have been made.

New: TB eradication – effectiveness and cost of alternative operational strategies

AHB ref: R-10731

Contracted by: Animal Health Board

To compare the cost-effectiveness of different strategies for confirming the eradication of TB from wildlife hosts. A major six-year operational trial will include supervision and training in new techniques and tactics, collating and interpreting multi-source data, modelling outcomes, and providing objective measures of TB persistence in possums and other wildlife hosts.

The model for a cost–benefit analysis of deer control within a TB eradication programme has been completed and the outcomes have been reported. An operational plan for comparing the speed and cost-effectiveness of four different operational approaches to achieving and confirming possum freedom from TB was developed for the Hauhungaroa and Rangitoto Ranges.

Fieldwork has been completed comparing seasonal variation in the detection of possums in Tihoi 3A (Hauhonga Ranges), and initiation of winter-season mop-up trapping. All field work will be completed by May 2013 and reported to the Animal Health Board.

Modelling the probable concentrations of 1080 in the environment following aerial 1080 drops

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

AHB ref: R-10695

Using laboratory protocols described by OECD *Guideline 307,* the rate of degradation and transformation products of 1080 in soil was measured. The transformation rate of 1080 obtained in this study was higher than previous reported values. The DT50 values from this investigation varied from six to eight days at 20ºC, 10 to 21 days at 10ºC, and 22 to 43 days at 5ºC. The rate of degradation of 1080 in the tested soils was primarily dependent upon the temperature of incubation, and the effect of soil moisture content varied between the different soils. This study demonstrated biological degradation was the dominant mechanism for the transformation of 1080 in New Zealand soils, and the microorganisms in New Zealand soils readily transformed and degraded residues of 1080 under suitable climatic conditions. A final report was submitted to the Animal Health Board and the Department of Conservation, and results presented at the National Pest Control Agencies technical conference in November 2010. Publication of the results in a peer reviewed science journal is planned in 2011.

New: Improvements to modelling 1080 concentrations in surface waters – adding spatial sensitivity and soil-water transport mechanisms

AHB ref: R-80713-01

Contracted by: Animal Health Board

To refine the existing model (which estimates the maximum probable 1080 concentration), in order to enable it to predict likely 1080 concentrations in streams under realistic 1080 application conditions. 1080 release curves have been developed for Wanganui and RS5 cereal baits under medium- and high-intensity rainfall conditions. Field trials are to be conducted this year to track the transport of 1080 in runoff and soil water under simulated and natural rainfall conditions. The field results will be incorporated into the 1080 model which is to be part of Water Resource Explorer New Zealand.

Effects on rongoā Māori

Update: Information database about 1080 and taonga species

AHB ref: R-80667-02

A database was set up in 2005-06 to organise and present information to Māori communities on 1080 non-target impact. This is updated every year, and is available at www.lincoln.ac.nz/1080. Māori communities have been informed of this database through hui, Māori media and other established networks. This project is ongoing.

Update: Māori interest in natural occurrence of 1080 in New Zealand plants

AHB Ref: R-80725

Contracted by: Animal Health Board

Carried out by: Eco Research Associates Ltd

Following indications of naturally occurring 1080 in puha in an earlier Animal Health Board study, researchers surveyed other New Zealand plants to see if natural occurrence of 1080 was more widespread. A literature review found there were at least 48 plant species internationally that had been reported to naturally contain 1080. The closest relatives of these plants in this country were included in a set of 17 plant species that were sampled and analysed for 1080 content. None of the sampled plants contained 1080, indicating the previously observed presence of 1080 in puha was an unusual phenomenon for New Zealand. The natural occurrence of 1080 in plants in New Zealand is therefore likely to be rare.

Other activity

Approval of alternative toxins

Para-aminopropiophenone (PAPP)

An alternative vertebrate toxic agent (PAPP) for the control of mustelids and feral cats was given approval under the HSNO Act in March 2011. PAPP is also registered under the Agricultural Compounds and Veterinary Medicines Act under the trade name PredaSTOP for stoat control.

PAPP is a rapid acting toxin for which there are low secondary poisoning risks and low risk to non-target species if used as specified. PAPP must be used in bait stations or tracking tunnels to exclude other species.

Microencapsulated zinc phosphide (MZP)

An alternative vertebrate toxic agent for the control of possums was given approval under the HSNO Act in August 2011. MZP has not been registered under the Agricultural Compounds and Veterinary Medicines Act.

Parliamentary Commissioner for the Environment's report

The Parliamentary Commissioner for the Environment (PCE) is an independent officer of Parliament and provides Members of Parliament (MPs) with independent advice in their consideration of matters that may have an impact on the environment.

Because of the ongoing controversy regarding 1080, the PCE undertook an investigation to provide MPs, members of the public and other interested groups with an independent assessment of 1080. The call for a moratorium on 1080 from some MPs was a major impetus for the PCE's investigation. The PCE's report *Evaluating the use of 1080: Predators, poisons and silent forests* can be found on the PCE website at www.pce.parliament.nz/publications/all-publications/evaluating-the-use-of-1080-predators-poisons-and-silent-forests

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