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Empirical Data Analysis of Aerial 1080 Operations by OSPRI (formerly the Animal Health Board) 2008 -2016.

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Abstract: This report analyses all aerial 1080 operations undertaken by OSPRI/Animal Health Board (AHB) as reported to the Environmental Protection Authority between 2008 and 2016. Of the 214 aerial operations covering over 2.75 million hectares of public conservation land there is no direct evidence of the success of the operations, in terms of eradicating possums, and concludes that OSPRI have made no attempt to analyse either the effectiveness or value for money of aerial distribution of 1080.

Keywords: 1080; OSPRI; possums; aerial

Introduction

The use of aerial 1080 (sodium monofluoroacetate) in New Zealand as a method of controlling rats, stoats and possums has been continuous since 1954. It is a controversial practice with many as it is seen an indiscriminate method of distributing a non-species selective toxin which, despite its use for over sixty years, has not reduced the number of target species and has killed some of the species it is intended to protect such as kea (*Nestor notabilis*).

In 2007 the then Environmental Risk Management Authority (ERMA) undertook a review of aerial 1080 practices, which culminated in a report and series of regulations for subsequent aerial operations. The reporting requirements were enacted under Section 77A of the Hazardous Substances and New Organisms Act 1996 and stipulated what information must be provided to EPA subsequent to an agency performing an aerial 1080 drop. ERMA is now the Environmental Protection Agency (EPA).

Those reports submitted by OSPRI/AHB between 2008 and 2016 provide the data for the analysis in this paper.

Methods

Data Source

All data for the analysis were abstracted from aerial 1080 Operational Reports provided by OSPRI/AHB to the EPA. Copies of all these reports can be found at <https://www.epa.govt.nz/resources-and-publications/1080-aerial-operators-reports/?tag=>

Data Entities

Information provided in each report conformed, to varying degrees, with that stipulated by Regulation 77A as follows:

(1) Any person who applies, or engages another person to apply, this substance by aerial application (“the operation”) must, as soon as reasonably practicable, but no later than six months, after the operation, provide a written report to the Authority, such report to include the following information—

(a) the reasons for the operation, including information on pre-operation notification and the methods and outcomes of any pre-operation consultation;

(b) details of the operation, including date(s), location and application rate;

(c) a map of the operational area showing relevant waterbodies, any public drinking-water supply, nearby farmland, human habitations and recreational huts and tracks;

(d) a measure of possum or other relevant pest numbers before and after the operation (if available);

(e) reports on any incidents (for example, accidental releases or overflights) or complaints in relation to the operation, including details of relevant parties, locations, actions, impacts (if available);

(f) details and results of pre- and post-operational monitoring of birds and invertebrates (if available);

(g) details and results of post-operational monitoring of water quality (if available);

(h) details and results of pre- and post-operational monitoring of key species of relevance to Māori (food, rongoa species) (if available); and

(i) an overall assessment of the outcome of the operation.

For the purposes of this analysis, data items (d), (f) and (h) i.e. measurements of possums, birds and taonga species numbers before and after the operation, are used.

Data Capture

The following data items for each operation were extracted from the reports and entered into a database:

1. Date of report.
2. Date of 1st drop.
3. Region.
4. Location identity.
5. Treated area (Ha).
6. Sowing rate (kg bait/Ha).
7. Target species monitored (Y/N).
8. Target species monitoring post-drop (Y/N).
9. Species to benefit monitoring (Y/N).
10. Non-target species monitoring (Y/N).

11. Water monitoring (Y/N).
12. Threatened species monitoring (Y/N).
13. Pre-drop monitoring (Y/N).
14. Pre-drop RCTI or BMI.
15. Date of pre-drop RCTI or BMI.

Data Analysis

Between 2008 and 2016 OSPRI/AHB reported on 2014 aerial 1080 operations as follows:

year	number
2008	39
2009	34
2010	16
2011	23
2012	21
2013	25
2014	6
2015	31
2016	19
TOTAL	214

Each operation was queried to assess whether target (possum), non-target (birds, ungulates) and taonga populations were monitored before and/or after the aerial 1080 operation.

Those that showed monitoring before AND before and after the operations were deemed to have been monitored for effectiveness. This distinction was a pragmatic one – identifying possum populations before a drop justifies that operation and if possum population monitoring is performed before and after an aerial operation this confirms the efficacy, or otherwise, of that operation.

Possum populations were assessed using one of two methods as determined by the National Pest Control Agencies (NPCA) 2011 protocol– the residual catch trap index (RCTI) and the Bite Mark Index (BMI). Details of the methodology are found in www.npca.org.nz/images/stories/NPCA/PDF/a1_possum%20monitoring_2015-nov_lr.pdf

Results

By Operation

Only 9% of aerial operations had any sort of possum monitoring performed.

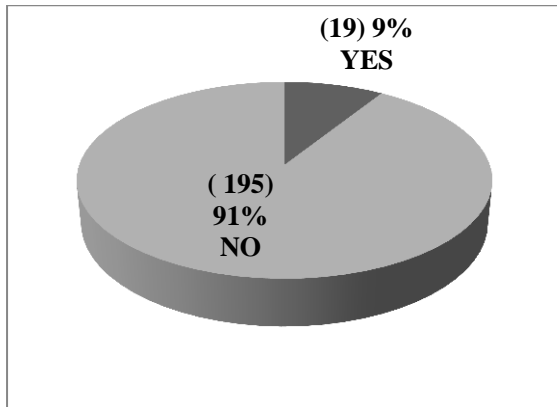


Chart 1: number of aerial 1080 operations that had pre- and post-drop monitoring for possum numbers.

By Land Mass

Of the 2,751,567 hectares of land aerially treated with 1080 by OSPRI, only 7% (193,824 hectares) was monitored for possum numbers both prior to and before and after the operation.

93% of the aerially treated land (2,557,743 hectares) was not monitored for possum numbers.

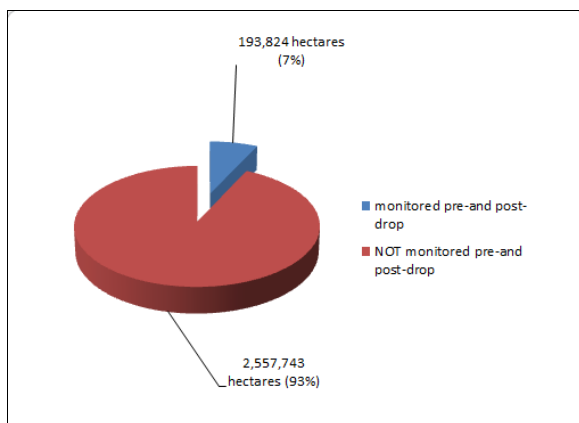


Chart 2: number of aerial 1080 operations monitored for possum numbers pre-and post-drop by land area treated.

Sowing Rates

There was no clear pattern for sowing rates chosen for each operation.

sowing rates	no. of operations
less than 1kg bait/hectare	6
1.5kg bait/hectare	31
2kg bait/hectare	125
3kg bait/hectare	11
other	41

Other Anomalous Data (DoC)

From 2014 onwards the Department of Conservation commenced the Battle for our Birds (BfoB) aerial 1080 operations over many National Parks.

As for OSPRI, DoC submitted operational reports to the EPA on each BfoB operation. One of the regulatory stipulations of EPA reporting is to identify the “reason for the operation...” In all BfoB reports the reason was for “Possum, Ship Rat Control...”

A typical example of BfoB was the Kahurangi 2016 aerial operation - a little under 300,000 hectares of the National Park were covered with 667 kg of poison (445 tonnes of cereal baits) over a period of 5 months. Prior to this tracking tunnels were employed to measure before and after incidences of target predators:

KAHURANGI NATIONAL PARK Battle of our Birds Monitoring Data						
area	possum tracking		rat tracking		stoat tracking	
	before	after	before	after	before	after
Cobb	not done	not done	53.8	1	0	0
Goulard	not done	not done	53.3	3.9	14.3	0
Kakapo	not done	not done	27.7	3.6	11.4	0
Oparara	not done	not done	50.1	23	0	0
Parapara	not done	not done	43.2	2.4	35.1	0
Wangapeka	not done	not done	44.7	0.4	27.6	12

Details of when the monitoring was done is given but not for how long nor whether the pre- and post –drop monitoring periods were identical. Nevertheless rat tracking indices (I am careful to use this rather than rat numbers) fell markedly after the drop, albeit randomly.

Oparara for example, still had a high rat tracking index after the drop. Some areas registered zero stoats before the drop and Wangapeka had high stoat indices pre- and post-drop.

Despite possums being declared a target species, no monitoring of numbers was done either before or after the drop and thus no conclusions could be reasonably inferred as to the success of the operation in this respect.

In the Eglinton Valley BfoB aerial 1080 operations revealed some more random results with mice tracking indices climbing from 8% and 1% in two monitored areas, to 28% and 8% respectively.

Similarly, the Iris Burn BfoB operations revealed rat tracking indices in the Hidden Lakes area climbing from 20% to 27% after the drop.

Discussion

Based on the data provided there is no empirical evidence of the efficacy of OSPRI operations in terms of possum control – there is simply insufficient data to draw any conclusions.

OSPRI cite Tb reduction rates as proof of the success of their OSPRI operations but the causal link is lacking. For instance, for the three years ending January 2015 to January 2017, OSPRI data reveal that the Tb rates in domestic cattle have increased with increasing amount of land aerially treated with 1080:

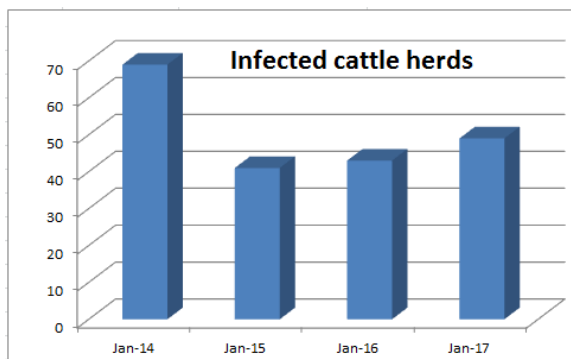


chart 3: number of Tb infected cattle herds
(source OSPRI annual reports)

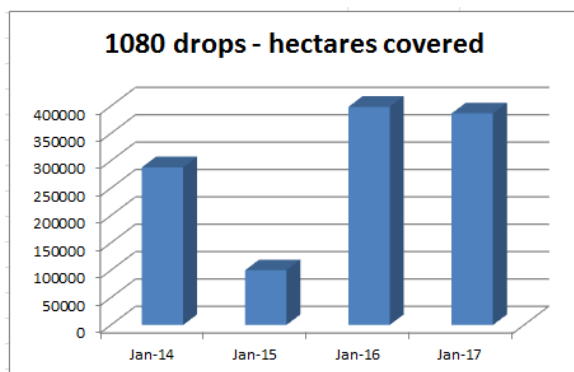


chart 4: number of OSPRI aerial 1080 operations

It is as, if not more, likely that Tb rates in cattle are being reduced by greater monitoring, control and management of stock movements.

From 2006 to 2015, 124,214 possums had been autopsied and only 54 (0.04%) tested positive for Tb. These figures support the notion that, whilst possums are indeed vectors of Tb, they are a miniscule one. What is even more damning is that all of those possums came from areas where Tb was thought to be high – Vector Risk Areas.

The analysis on the 214 OSPRI 1080 operations are interesting. Collectively they have involved dispersing 1,066,643,808 kilograms of bait over 2.76 million hectares of public conservation land that, in some cases, abuts farmland.

In terms of the selected DoC aerial 1080 operational data:

1. There is not high correlation between 1080 aerial drops and rat number declines for 100% of the operations (there is an element of randomness).
2. The eradication of rats, stoats and possums is not supported by the data published in 400 DoC operational reports since 2008, and
3. There is no monitoring of possums, despite the operation specifically referring to them as a target species for poisoning.

The BfoB data similarly shows that either target species (possums) have failed to have been monitored at any stage of the operations, or there is sufficient variance in enough of the data to indicate that aerial 1080 operations, at best, suppress some rat and some stoat populations briefly.

Acknowledgements

Possum autopsy figures came from an OIA request from Richard Prosser, NZ First MP.

All other data was from the EPA operators reporting and the OSPRI annual reports.