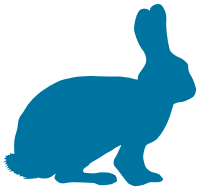

NSWRAB SOP2 Aerial baiting of rabbits with sodium monofluoroacetate (1080)

Background

Poisoning with sodium monofluoroacetate (1080) is used to minimise the impact of the introduced European rabbit (*Oryctolagus cuniculus*) on agricultural production and the environment. Poisoning with 1080 is an effective method of quickly reducing rabbit numbers and is usually performed prior to harbour destruction and warren fumigation. 1080 is an odourless, tasteless white powder that has a coloured dye added for identification of the toxin and is supplied as a concentrated solution. It is used for poisoning of rabbits by incorporating it into a suitable bait material. Poison bait is offered either as a concentrated trail or broadcast (scattered) in a swathe on the ground, or, from the air by an agricultural aircraft with a modified hopper. Ground baiting procedures are described *NSWRAB SOP1 Ground baiting of rabbits with 1080*. Free-feeding with unpoisoned bait is performed for a number of days prior to laying poisoned baits and is an essential step in a baiting program.

Rabbits are moderately susceptible to the effects of 1080; however, other species, especially some native animals and birds and domestic livestock are also vulnerable to poisoning. Good baiting technique helps to minimise the risk to non-target species and maximise the effect on targeted rabbit populations.

This standard operating procedure (SOP) is a guide only; it does not replace or override the relevant NSW or federal legislation. The SOP should only be used subject to the applicable legal requirements (including WHS) operating in the relevant jurisdiction.

Application

- Aerial baiting programs must only occur when subjected to a risk assessment and approved by an ACO and relevant authority.
- Baiting with 1080 should only be used in a strategic manner as part of a co-ordinated program designed to achieve sustained effective control.
- In NSW 1080 must also be used in accordance with the *Pesticides Act 1999* and the relevant Pesticide Control Orders (which include distance restrictions, signage and notification requirements).
- Baiting of rabbits with 1080 can only be carried out under conditions set down in a specific permit issued by the Australian Pesticides & Veterinary Medicines Authority (APVMA) under Commonwealth legislation (*Agricultural and Veterinary Chemicals Code Act 1994*).

- In NSW, aerial baiting for rabbit control should be restricted to areas where ground control is impractical or where it is necessary for the protection of threatened species. Approval for every aerial baiting program on land reserved under Part 4 of the *National Parks and Wildlife Act 1974* must be obtained from the relevant NPWS Regional Director. For all other land, approval for every aerial baiting program must be obtained from the LLS Chair of Chairs or their delegate. Aerial baiting must be organised through either LLS or NPWS or any other approved NSW public authority.
- Poisoning is used as an initial control method to reduce high rabbit populations to a more manageable level. Fumigation and ripping of warrens are then used as follow-up techniques to reduce harbour and to slow re-colonisation. Poisoning is also an important management tool in areas where rabbits are mainly surface dwelling or where it is too difficult to rip warrens.
- Controlling rabbits with 1080 bait cannot be undertaken in areas where there is an unacceptably high risk to humans and/or companion animals, such as urban/residential environments.
- Aerial baiting programs should only occur when the risk of non-target uptake is minimal.
- Aerial baiting is used to treat large areas of land. It is best suited to steep, rocky/hilly areas or inaccessible islands where ground baiting techniques cannot be employed and where impacts by rabbits are likely to be significant.
- Aerial baiting can only be applied by helicopter in the eastern division however fixed wing planes can also be used in the western division.
- Aerial baiting programs only apply to areas and situations that meet the restrictions stated in the LLS and NPWS approved task profiles and procedures for aerial baiting (available from ACOs).
- Aerial baiting is useful for broad-scale application, but it is less accurate than ground baiting. It should not be used where non-target animals occupy habitat close to the proposed treatment area.
- 1080 use is restricted in areas where there is a high risk of poisoning domestic stock and wildlife.
- Because water reduces the concentration of 1080 in bait, poisoned bait should be laid when there is a low chance of rain within several days of laying.
- Aerial baiting programs are best undertaken when alternative food for rabbits is scarce i.e., often at the end of summer or early autumn.
- Baiting may be less effective when feed supply is abundant and also during the breeding season when juvenile rabbit movements may be limited, and they are less likely to find the bait. Kittens over 17 days old can survive even if the mother is poisoned and subsequent breeding by these survivors can cause rapid recovery of the population
- 1080 is a restricted chemical product (under Regulation 45 of the Agricultural and Veterinary Chemicals Code Regulations 1995) and is listed as a Schedule 7 – Dangerous Poison under the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP). These listings require special precautions in the manufacture, handling, storage and use of 1080, along with specific regulations regarding labelling or availability.
- Handling of 1080 concentrated solution and preparation of baits must only be performed by an authorised person (ACO).

- Prepared and manufactured 1080 baits can only be obtained through authorised government agencies.
- The 1080 user should refer to the NSW Vertebrate Pesticide Manual for all relevant legislation and its application.

Animal welfare implications

Target animals

- The toxicity of 1080 is due to the conversion of fluoroacetate to fluorocitrate, which inhibits the tricarboxylic acid cycle – a mechanism necessary for cellular energy production. In general, herbivores experience cardiac failure, whereas carnivores experience central nervous system (CNS) disturbances and convulsions and then die of respiratory failure. Some species, usually omnivores, can be equally affected by both CNS and cardiac signs e.g., pigs.
- After a rabbit has ingested 1080 there is a latent period ranging from around 30 minutes to 4 hours before signs such as lethargy, laboured respiration and increased sensitivity to noise/disturbance are observed. Convulsions start suddenly, often with gasping and squealing, followed by death. Time to death is variable depending upon the amount 1080 absorbed but is usually around 3 to 4 hours. The precise nature and extent of suffering after ingestion of 1080 is unknown.
- To minimise the animal welfare implications of leaving dependant young to die a slow death from starvation it is preferable not to undertake baiting programs when rabbits are known to be breeding. This is also the time when young rabbits do not travel far from their burrows and bucks vigorously defend their territorial boundaries, making it less likely that all rabbits will have access to bait. In many areas of Australia there is a peak in breeding from late winter to early summer when pastures have greened up after rain.

Non-target animals

- 1080 is toxic to a wide range of species including birds, mammals and reptiles; however, there are marked differences in susceptibility. Dogs are extremely susceptible, and most other carnivores are highly sensitive to 1080 poisoning. Herbivores are less sensitive, and birds and reptiles increasingly resistant. Poisoning of non-target species can occur either directly by eating baits intended for rabbits (primary poisoning) or through the scavenging of tissues from a poisoned animal (secondary poisoning).
- There is a potentially greater risk to non-target species with aerial application of poisoned bait than occurs with ground baiting. Poisoned rabbit carcasses cannot usually be collected, uneaten baits cannot be covered or removed, and all bait will not necessarily be available to rabbits.
- To minimise the potential for toxic baits to be lethal to non-target animals, the following baiting strategies are recommended:
    - *Pre-feeding with non-poisoned bait* – allows an assessment of what animals are eating the bait.

- *Bait type* – surface coated rather than vacuum impregnated oat baits will reduce exposure of granivorous birds to the toxin. Most of these birds will only eat the kernel and discard the poisoned husk.
- Carrots are diced to an optimal size favoured by rabbits (2 to 5 grams). Pieces smaller than this tend to retain and absorb a higher loading of 1080 and are more likely to be eaten by birds. They will also dry out and leach 1080 more rapidly than bigger pieces.
- *Colouring of baits* – baits that are dyed a specific green or blue colour may be unattractive or less obvious to birds.
- *Placement of baits* – the bait should always be placed in the prime feeding areas of rabbits.
- *Timing of baiting* – rabbits mostly feed at night, therefore, bait laid in the evening will be mostly consumed overnight before diurnal non-target species such as birds will have access. However, nocturnal mammals will be at risk when bait is laid in the evening.

First aid for dogs

- 1080 baits are highly attractive to other carnivores such as dogs. Care must be taken to ensure that working dogs and pets do not come into contact with 1080. Dogs may eat poisoned bait (especially pellets) or poisoned rabbit carcasses. The prognosis for poisoned dogs is extremely poor unless vomiting can be induced shortly after ingestion of 1080 and before clinical signs are evident.
- If a working dog or pet is known to have consumed a bait but is NOT yet showing signs of poisoning, induce vomiting by giving one of the following emetics by mouth:
  - washing soda crystals (sodium carbonate) – 3 to 5 crystals orally, DO NOT use laundry detergents or powders
  - table salt – 2 teaspoons of salt in 1 cup of water; more or less depending on the size of the dog
  - dilute hydrogen peroxide (3% solution) – 3 to 5ml
  - If the dog has vomited, clean it up immediately as the vomit is toxic.
- THEN SEEK VETERINARY ATTENTION IMMEDIATELY. The sooner action is taken following poisoning the better the prognosis.
- If these emetics are not immediately to hand or you are not having success in making the dog vomit it is better to seek veterinary attention immediately rather than waste time.
- If the dog has already begun to show signs of toxicosis (retching and vomiting, frenzied behaviour such as running and howling, convulsions, difficulty breathing etc.), DO NOT induce vomiting, but seek veterinary attention without delay.
- Veterinary intervention aims to decrease 1080 absorption and facilitate excretion; control seizures; and support respiration and cardiac function.
- See *First Aid – 1080 and your dog* for more information: https://pestsmart.org.au/wp-content/uploads/sites/3/2020/06/1st_aid_booklet-1.pdf

Workplace health and safety considerations

- If poisoning occurs, contact a doctor or the Poisons Information Centre (Ph 13 11 26) IMMEDIATELY. Urgent hospital treatment is likely to be needed. There is no effective antidote to 1080.
- For further information refer to the Material Safety Data Sheet (MSDS), available from the supplier, the Pesticide Control (1080 Bait Products) Order, and the NSW DPI Vertebrate Pesticide Manual.

Procedures

- An ACO must conduct a risk assessment to determine if it is appropriate to supply 1080 baits to any person. Risk assessments should consider threats to non-target species particularly domestic dogs, human health and the environment.
- ACOs must conduct a risk assessment of planned group baiting programs where baiting occurs less than the prescribed minimum distances provided in the current 1080 PCO.
- Users of 1080 must always refer to any risk assessment, specific permit, approved label and Pesticide Control (1080 Bait Products) Order for up-to-date information on conditions of use including distance restrictions, public notification and bait preparation, distribution, storage, transportation and disposal.
    - Pesticide Control (1080 Bait Products) Order: https://www.epa.nsw.gov.au/your-environment/pesticides/pesticides-nsw-overview/pesticide-control-orders
    - NSW DPI Vertebrate Pesticide Manual: https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/publications/nsw-vertebrate-pesticide-manual

Fixed-wing aircraft or helicopters

- The aircraft must be suited to the purpose and must be registered to perform the task as per agency guidelines.
- The aircraft must be equipped with a Global Positioning System (GPS).
- The location of all bait transects must be accurately recorded.
- A restrained leak–proof bait hopper and bait distribution mechanism should be used for dispensing of baits.
- The pilot must be suitably experienced and licensed to perform the task
- Aircraft operators must ensure that their flying operations comply with requirements of the Civil Aviation Safety Authority.

Planning

- Aerial baiting should not be undertaken in excessively windy conditions where accuracy of bait dispersal and ability to maintain appropriate groundspeed may be adversely affected.

- Prior to the flight, map out transects (or flight lines) at 1km apart and calculate the baiting density in kgs per square kilometre. The transect length is divided by the ground speed to give an even distribution of baits for the area.
- Enter the transect coordinates into the GPS to ensure accurate navigation and dispersal.

Dispersal of baits

- Baits must be dispersed a minimum of 500m from habitation, 100m from property boundary, 200m from domestic water supply or water draw point, and 200m from a public road, for both helicopter and fixed-wing aircrafts.
- Provisions must be in place to ensure that baits are dropped only within the target area.
- Following the pre-determined transects, drop the baits at a linear rate to achieve the desired baiting application rate. The aircraft should travel at a suitable ground speed and height that enables the baits to be safely dropped with accuracy and precision.
- Bait dispersal locations should be recorded by GPS coupled to software capable of storing these positions.

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