NSWFOX SOP2 Aerial baiting of foxes with sodium monoflouroacetate (1080)

Background

Poisoning with sodium monofluoroacetate (1080) is used to minimise the impact of the introduced European red fox (*Vulpes vulpes*) on native fauna and agricultural livestock. Lethal baiting is considered to be the most effective method currently available. Foxes are amongst the most sensitive species to the effects of 1080. Good baiting technique helps to minimise the risk to non-target species and maximise the effect on targeted fox populations.

1080 is an odourless, tasteless concentrated solution that has a coloured dye added for identification of the toxin. It is used for poisoning of foxes by incorporating it into fresh, dried or processed meat baits. Poisoned baits are distributed either on the ground by hand or from the air in a helicopter or fixed-wing aircraft. Good baiting technique helps to minimise the risk to non-target species and maximise the effect on targeted fox populations. Ground baiting procedures are more common for fox control in NSW and are described in NSWFOX SOP1 *Ground Baiting of Foxes with 1080*.

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

Individual SOPs should be read in conjunction with the overarching Code of Practice for that species to help ensure that the most appropriate control techniques are selected and that they are deployed in a strategic way, usually in combination with other control techniques, to achieve rapid and sustained reduction of pest animal populations and impacts.

Application

- Aerial baiting programs must only occur when subjected to a risk assessment and approved by an Authorised Control Officer (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.
- Baiting of foxes 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 1080 must also be used in accordance with the *Pesticides Act 1999* and the relevant Pesticide Control Orders (that include distance restrictions, signage and notification requirements).

- In NSW aerial baiting for fox 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 Branch Director. For all other land, approval for every aerial baiting program must be obtained from the LLS Chief Executive or their delegate. Aerial baiting must be organised through either LLS or NPWS or any other approved NSW public authority.
- Aerial baiting is recommended for large, sparsely populated areas that are remotely located and inaccessible by vehicles. Use of fixed wing aircraft is only permitted in the Western Division of NSW.
- Aerial baiting programs are limited 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).
- 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) who has the appropriate training.
- 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 such as pigs, can be equally affected by both CNS and cardiac signs.
- After a fox has ingested 1080 there is a latent period of around 30 minutes to 3 hours before initial signs such as hyperexcitability, vocalisation, manic running and vomiting/retching are observed. Although the precise nature and extent of suffering after ingestion of 1080 is unknown, it is likely that the animal will experience distress and possibly pain during this initial stage. In the final stages of toxicosis, signs of central nervous system disturbance are marked and include collapse, convulsions and tetanic spasms. During periods of prolonged convulsions, it is possible that animals are lucid between seizures, however this is difficult to assess. If animals *are* conscious during the convulsive episodes or if they become conscious afterwards it is possible that they may experience pain and anxiety. There is also potential for injuries to occur after the

appearance of clinical signs. Death occurs around two hours after the onset of clinical signs.

- To minimise the animal welfare implications of orphaning dependent cubs, it is preferable not to undertake baiting programs when vixens are lactating. This is also the time when vixens are moving around least within their territory thus reducing the likelihood of finding baits. To maximise the effect of fox control prior to spring lambing for example, baiting should be conducted during June and July when foxes are mating and more mobile.

Non-target animals

- 1080 is toxic to a wide range of species including birds, mammals and reptiles; however, there are marked differences in sensitivity. Dogs are extremely sensitive, and most other mammalian carnivores are highly sensitive to 1080 poisoning. Herbivores are less sensitive, and birds and reptiles increasingly more tolerant.
- Poisoning of non-target species can occur either directly by eating baits intended for foxes (primary poisoning) or through the scavenging of tissues or vomitus from a poisoned animal (secondary poisoning).
- The susceptibility of non-target species to 1080 poisoning is determined by many factors including sensitivity to the poison, body weight, concentration of 1080 in the bait, bait placement, bait type and palatability, timing of baiting and level of exposure to toxic baits.
- There is a potentially greater risk to non-target species with aerial application of baits than occurs with ground baiting where baits are buried. Randomly dispersed baits on the surface of the ground can more easily be found by other animals. Foxes can take longer to encounter the baits, whilst baits made from dried meat can remain toxic for many months, especially in drier regions where degradation of 1080 is slow.
- The following baiting practices are recommended:
    - *Bait type* – dried meat baits are used to improve target specificity and to reduce insect activity. They are highly attractive to foxes but because of their dry, tough consistency will less likely be consumed by scavenging birds or native mammalian carnivores.
    - *Bait size* - each red meat and offal bait must weigh approximately 100 grams prior to any drying process.
    - *1080 concentration* - each bait contains a precise amount of 1080 (3.0 mg is recommended) that is sufficient to deliver a lethal dose to a fox. The rate is calculated to minimise sub lethal doses and overdosing.
    - *Distance between baits* – the minimum distances for the laying of 1080 fox baits have been set to minimise the risk to people and to non-target animals. Aerial baiting for foxes is permissible at a rate of up to 10 baits per km.
    - *Timing of baiting* – the risk of poisoning non-target species is increased when regular food sources are scarce, therefore timing should be adjusted to lessen exposure.

First aid for dogs

- Fox 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 fox baits. The prognosis for poisoned dogs is extremely poor unless vomiting can be induced shortly after ingestion of the bait 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
  - table salt – 1 to 3 tablespoons
  - 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 *Working dog safety & first aid* for more information

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 and 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) that has a moving map display with topographic features and dull data logging capabilities.
- Crew must include a navigator (appropriately trained air observer)
- The location of all bait transects must be accurately recorded.
- A restrained leak–proof bait hopper and bait distribution mechanism (or equivalent) 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 baits 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

- Aerial baiting of foxes is permitted by fixed wing aircraft and helicopters subject to certain conditions. Baits must be dispersed at differing minimum distances depending on use of helicopter or fixed wing aircraft. Refer to the relevant PCO for these conditions and distances.
- 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 density. Baits must not drop at more than 10 baits per kilometre of transect. 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.

A timing system should be employed to indicate when to drop each bait to achieve the pre-determined spacing.

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