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NATSOP-FOX002 NATIONAL STANDARD OPERATING PROCEDURE: AERIAL BAITING OF FOXES WITH SODIUM FLUOROACETATE (1080)

Voluntarily adopted by the Vertebrate Pest Committee 2012 with the Invasive Plants and Animals Committee endorsing minor updates September 2017.

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. Other fox control methods include shooting, trapping, den fumigation, den destruction and exclusion fencing. Lethal baiting is considered to be the most effective method currently available.

1080 is an odourless, tasteless white powder that has a special 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. Ground baiting procedures are described in NATSOP-FOX001 National Standard Operating Procedure: Ground baiting of foxes with sodium fluoroacetate (1080).

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.

This National Standard Operating Procedure (NATSOP) is a guide only; it does not replace or override the legislation that applies in the relevant state or territory jurisdiction. The NATSOP should only be used subject to the applicable legal requirements (including OH&S) operating in the relevant jurisdiction.

APPLICATION

- Baiting with 1080 should only be used in a strategic manner as part of a co-ordinated program designed to achieve sustained effective control.
- Aerial baiting is recommended for large, sparsely populated areas that are remotely located and inaccessible by vehicles.
- Aerial baiting programs are conducted on pastoral land and in national parks as part of long-term control strategies for wildlife conservation.
- Aerial application is the most commonly used method of baiting in Western Australia, and is also used in Queensland and the Northern Territory. In NSW and South
- Australia aerial baiting for foxes is sometimes used under a special permit where endangered species are being protected on Crown land.
- Aerial baiting programs should only occur when the risk of non-target uptake is minimal.
- 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). 1080 must also be used in accordance with relevant State, Territory and other Commonwealth legislation. The 1080 user may need to make a referral under the EPBC Act. See Table 1.
- 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 Drugs and Poisons (SUSDP). 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 powder or concentrated solution and preparation of baits must only be performed by authorised persons who have the appropriate training.
- Prepared and manufactured 1080 baits can only be obtained by through authorised government agencies.

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Table 1: Relevant federal, state and territory legislation for the use of 1080

State	Legislation
Federal	Environment Protection and Biodiversity Conservation Act 1999 Information available from the Department of the Environment and Energy website: http://www.environment.gov.au/epbc/
Australian Capital Territory	Environment Protection Act 1997
New South Wales	Pesticides Act 1999
Northern Territory	Poison and Dangerous Drugs Act 1999 Territory Parks and Wildlife Conservation Act 1998
Queensland	Health (Drugs and Poisons) Regulations 1996
South Australia	Controlled Substances Act 1984 Controlled Substances (Poison) Regulations 1996
Tasmania	Poisons Act 1971 Agricultural and Veterinary Chemicals (Control of Use) Act 1995
Victoria	Agricultural and Veterinary Chemical (Control of Use) Act 1992

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Western Australia	Poisons Act 1964 Poisons Regulations 1965

ANIMAL WELFARE CONSIDERATIONS

Impact on 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 (i.e. August and September). 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.

Impact on 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 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.

- To help reduce risks to non-target animals the following baiting practices are followed:
- Bait type – dried meat baits are used to improve target specificity. 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 – baits are made large enough so that smaller carnivorous mammals cannot eat enough of them to ingest a lethal dose.
- 1080 concentration – each bait contains a precise amount of 1080 which is sufficient to deliver a lethal dose to a fox. The rate is calculated to minimise sublethal doses and overdosing.
- Distance between baits – dispersing baits some distance apart minimises the risk of native animals finding baits. Also, foxes are less likely to cache baits when they are placed further apart.
- 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
  – dilute mustard and water solution.
  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.

HEALTH AND SAFETY CONSIDERATIONS

- Operators using 1080 must strictly follow the directions on the approved label when preparing for use, using, storing, transporting or disposing of the pesticide.
- 1080 is highly toxic to humans and should be handled with care. Store prepared bait and 1080 concentrate in a labelled container in a locked cabinet away from children, animals and food. Do not handle 1080 where there is a risk of contaminating drinking water or foodstuff/feed intended for human or animal consumption.

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- Appropriate personal protective equipment, including cotton overalls, washable hat, elbow-length PVC or nitrile gloves and a face mask or safety glasses, should be worn when preparing and handling 1080 baits.
- If 1080 gets on skin, immediately wash area with soap and water.
- After use and before eating, drinking or smoking, wash hands, arms and face with soap and water. Wash contaminated clothing and gloves.
- 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.

EQUIPMENT REQUIRED

Poisoned baits

- Baits must only be prepared by authorised officers or persons under their direct supervision. Access to 1080 and poisoned baits must be restricted to approved personnel only. Refer to specific permit and approved label for further details.
- Dried meat baits, usually kangaroo, but sometimes horse, beef, emu and camel meat, are used for aerial application. Drying improves the target specificity of the bait, prevents degradation of 1080 and minimises damage from ants and other insects.
- Baits are prepared as follows:
  – cut chunks of meat into 120 g pieces;
  – inject 3 mg of 1080 into the centre of each chunk; and
  – dry at 40—45oC for a few days to achieve a weight of 40—45 g, equivalent to about a 60% loss in weight.
  It is best to use the baits within a few days after drying, but if necessary they can be frozen until required.
- Prepared baits must be stored and transported in a secure and safe manner.

Light fixed wing aircraft or helicopter

- The aircraft must be suited to the purpose eg a Cessna 182 and must be registered to perform the task.
- 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.

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PROCEDURES

Notification and warning signs

- Appropriate notification of an aerial baiting program must be given to the public and adjoining landholders. A summary of neighbour notification requirements for each state and territory can be found in Appendix 2.
- Notification should include the following information:
  – program duration
  – commencement date
  – type of bait used
  – poison used
  – target animal
  – location of the baiting zone
  – risks associated with 1080 including potential dangers to stock, unrestrained pets and working dogs
  – contact details for further queries.
- Appropriate warning signs must be erected at all entry points to the baited area, on public roads that bound baited areas and on public or private lands associated with the baiting program. It is recommended that signs remain up for a minimum of 4 weeks from the last day of baiting. A summary of warning sign requirements for each state and territory can be found in Table 2.

Table 2: Requirements for distance restrictions, neighbour notification and warning signs

State	Baiting density	Specified Minimum Distances for Aerial Baiting	Neighbour Notification	Warning Signs
NSW	Baits laid 200—500 m apart (min. 100 m)	*Aerial baiting only permitted in areas managed by NPWS* • Park boundary 100 m • Habitation 500 m (helicopter) or 1000 m (fixed wing) • Property boundary 10 m (helicopter) or 100 m (fixed wing) • Domestic water supply 20 m (helicopter) or 100 m (fixed wing)	72 hours prior to baiting Emergency situation – just prior to baiting	• All entry points • From start of baiting for minimum of 4 weeks
NT		Habitation/ public place/road 1 km	All neighbours must be clearly	Prominent position on property

			informed but no time restriction	and all public roads prior to baiting
Qld	Baits laid no less than 250 m apart	• Boundary fence 5 m • Habitation 2 km • Declared road 50 m • Town area 5 km	72 hours prior to baiting	All entry points Kept for a minimum of 1 month after baiting
SA	4 to 6 baits per km2	*Aerial baiting only permitted in areas managed by NPWS* • Public roads 250 m • Property boundary 1 km • Large water bodies 200 m • Habitation 2 km	7 days prior to baiting	• All entry points • Not more than 3 weeks prior and not less than 2 weeks after baiting
WA	5 baits per km2	Agricultural areas: • Roads 250 m • Boundary fence 500 m	72 hours prior to baiting	• Not covered by state

		• Recreational area 500 m Pastoral area • Towns/settled area/dwelling 5 km • Roads/public place 1km		legislation – but the policy of Dept of Ag & Food, and DEC is all entry points. • For duration of baiting and kept for a minimum of 1 month after baiting

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 the transects (or flight lines) at 1 km 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

- The specified minimum distances that 1080 baits can be laid from habitation, watercourses, boundary fences and roads etc. must be observed. A summary of distance restrictions for each state and territory can be found in Table 2.
- 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 (eg drop every 400 m for a density of 5 baits per km2).

- 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. The time between each drop varies in relation to ground speed.

PROCEDURAL NOTES

- Users of 1080 must always refer to the relevant federal, state and territory legislation for more detailed and up-to-date information on distance restrictions; public notification; bait preparation, distribution, storage and transportation; disposal of unused baits; and other conditions of use.
- Aircraft operators must ensure that their flying operations comply with requirements of the Civil Aviation Safety Authority.

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