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NATSOP-DOG005 NATIONAL STANDARD OPERATING PROCEDURE: AERIAL BAITING OF WILD DOGS 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

Wild dogs, which include feral domestic dogs, dingoes and their hybrids, prey on livestock causing significant impact on agricultural production. Methods of control include poisoning with sodium monofluoroacetate (1080), trapping, shooting, exclusion fencing, aversion and use of livestock guarding animals.

Lethal baiting is considered to be the most cost-effective control method currently available and is the only practical means for achieving population control in remote and inaccessible areas.

1080 is an odourless, tasteless white powder that has a special dye added for identification of the toxin. It is used for poisoning of wild dogs 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-DOG004 National Standard Operating Procedure: Ground Baiting of Wild Dogs with sodium monofluoroacetate (1080).

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 is best used in a strategic manner as part of a co-ordinated program designed to achieve sustained effective control. However, in some instances, baiting is reactive, occurring as a response to a series of attacks on livestock.
- Aerial baiting is used for large scale predation problems where ground baiting is impossible or impractical ie in sparsely populated, remotely located and inaccessible areas.
- Aerial application of baits is performed in Western Australia, Queensland, New South Wales and the Northern Territory. Aerial baiting for wild dogs is not permitted in South Australia, Victoria or the ACT.
- In NSW, aerial baiting requires specific approval from the Director General of Agriculture, or from the Minister for Environment for NPWS parks and reserves. Baiting using a fixed-wing aircraft is permitted in the Western Division; however a helicopter must be used in the eastern areas of NSW.
- Strategic aerial baiting programs are usually conducted annually to maintain effective dog-free buffer zones adjacent to livestock grazing areas.
- Timing and frequency of baiting depends on a number of variables including resources available, value and vulnerability of livestock, availability of alternative prey for wild dogs and season (weather, water availability, stage of dog breeding cycle). In Western Australia, baiting is usually conducted in spring, whereas in eastern Australia it usually occurs in late autumn to early winter.
- Aerial baiting programs should only occur when the risk of non-target uptake is minimal.
- Where precision of bait placement is essential, helicopters are preferred over fixed-wing aircraft. Helicopters are more easily manoeuvred and so are used in mountainous terrain. Fixed wing aircraft are used in extensive flatter terrain.
- Baiting of wild dogs 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.

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

Jurisdiction	Legislation
Federal	Federal Environment Protection and Biodiversity Conservation Act 1999
ACT	Australian Capital Territory Environment Protection Act 1997
NSW	New South Wales Pesticides Act 1999
NT	Northern Territory Poison and Dangerous Drugs Act 1999 Territory Parks and Wildlife Conservation Act 1998
QLD	Queensland Health (Drugs and Poisons) Regulations 1996
SA	South Australia Controlled Substances Act 1984 Controlled Substances (Poison) Regulations 2011

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TAS	Tasmania Poisons Act 1971 Agricultural and Veterinary Chemicals (Control of Use) Act 1995
VIC	Victoria Agricultural and Veterinary Chemical (Control of Use) Act 1992
WA	Western Australia Poisons Act 1964 Poisons Regulations 1965

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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 wild dog 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.

- To minimise the animal welfare implications of leaving dependent pups to die a slow death from starvation it is preferable not to undertake baiting programs when females are whelping i.e. late winter to spring in temperate areas. This is also the time when females are moving around least within their home range thus reducing the likelihood of finding baits.

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 wild dogs (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 mostly buried. Randomly dispersed baits on the surface of the ground can easily be found by other animals. Also, wild dogs can take longer to encounter the baits. 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 wild dogs but because of their dry, tough consistency will less likely be consumed by scavenging birds or native marsupial 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 (4.5 to 6.0 mg is recommended) which is sufficient to deliver a lethal dose to a wild dog. 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, wild dogs 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

- Wild dog baits are highly attractive to other carnivores. Care must be taken to ensure that working dogs and pets do not come into contact with wild dog 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 5 ml
  - 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.
- 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.

Always refer to specific permit and approved label for further details.

EQUIPMENT REQUIRED

Poisoned baits

- The pilot must be suitably licensed to perform the task.

Light fixed wing aircraft or helicopter

- The aircraft must be suited to the purpose (eg Cessna 182 or 206 fixed wing aircraft or Hughes 500 helicopter) 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.
- 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.
- Approved bait types vary between States and include fresh and dried bone-free red meat and registered commercially manufactured meat baits (DOGGONE®). Meat types commonly used are kangaroo, beef, sheep and horse. Mutton is not suitable for the injection method as it tends to be fatty and the fat can clog the needle of the injector gun, affecting the dosage per application. Also, liver or other offal is not suitable for aerial baiting as it disintegrates on hitting the ground.
- In most states 1080 is applied to the bait by injection. In Western Australia either a single oat grain containing 1080 is inserted into the meat or 1080 is injected into the bait.
- A single bait must contain sufficient toxin to be lethal to a target animal. For wild dogs the recommended dose of 1080 is 4.5 to 6.0 mg. The recommended bait size for fresh meat is 250 g (minimum 150 g) and 100 g for dried meat baits (minimum 45 g). DOGGONE® baits contain 6mg of 1080 in 60g bait.

- Dried meat baits, usually kangaroo meat, are commonly used for aerial application in Western Australia. Drying improves the target specificity of the bait, prevents degradation of 1080 and minimises damage from ants and other insects. In WA, dried baits are prepared as follows:
    - cut chunks of meat into 110 gram pieces
    - inject 6 mg of 1080 into the centre of each chunk, or insert a single 1080 impregnated oat
    - dry at 40-45oC for a few days to achieve a weight of approximately 45 grams, equivalent to about a 60% loss in weight.
- Baits must be stored and transported in a secure and safe manner. It is best to obtain baits only when they are required.
- Manufactured baits must be used within 1 month of issue. If necessary, store in a dry, secure area away from children, pets and foodstuffs.
- Prepared 'fresh' meat baits should be used immediately, but where this is not possible they must be used within 7 days of preparation. If necessary, prepared baits should be stored in a secure refrigerator where foodstuffs are not stored. It is recommended that fresh meat baits are not frozen. Freezing might cause a dilution of 1080, reducing the effectiveness of the bait.
- Prepared 'dried' meat baits are best used within a few days of drying, but if necessary they can be kept frozen until required.

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 below.
    - 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 numbers 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.

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.
- The placement of baits is critical to an effective program. Baits must be placed near dog leads, known habitats, routes and hunting/drinking areas. Random and widespread distribution of baits is inefficient and increases the chance of non-target species encountering the bait.
- When planning a baiting program, operators should consult state-specific guidelines to determine the optimum baiting density for the area.
- Prior to the flight, map the areas where baits are to be laid and calculate the number of baits required.
- Enter proposed bait location coordinates into a 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.
- Disperse the baits at the pre-determined locations. To achieve good baiting precision, the aircraft should travel at a set ground speed and height. Although these factors will be influenced by terrain and weather conditions, the following are given as a general guide:
    - for fixed-wing aircraft – 80 knots and 50 to 100 feet above ground level; and
    - for helicopters – 50 knots and 100 feet.
- Bait dispersal locations should be recorded by GPS coupled to software capable of storing these positions.

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.

Table 2: Requirements for Distance Restrictions, Neighbour Notification and Warning Signs

Jurisdiction	Specified Minimum Distances for Ground Baiting	Neighbour Notification	Warning Signs
NSW	Boundary fence 5 m Habitation 500 m Domestic water supply 10 m	72 hours prior to baiting Emergency situation – just prior to baiting	All entry points From start of baiting for minimum of 4 weeks
ACT	Boundary fence 5 m Habitation 500 m Domestic water supply 10 m	72 hours prior to baiting	All entry points From start of baiting for minimum of 4 weeks
NT	Habitation/ public place/ road 1km	All neighbours must be clearly informed but no time restriction	Prominent position on property and all public roads prior to baiting
QLD	Boundary fence 5 m	72 hours prior to baiting	All entry points

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Jurisdiction	Specified Minimum Distances for Ground Baiting	Neighbour Notification	Warning Signs
	Habitation 2 km Declared road 50 m Town area 5 km		Kept for a minimum of 1 month after baiting
SA	Boundary fence 5 m Habitation 500 m (unless own dwelling) Formed public roadway 20 m Watercourses 20 m Mown area 5 km	All neighbours must be clearly informed unless part of a community program. No specified time	All entry points and tourist destinations From start of baiting and kept for at least 3 months after last baits laid
VIC	Boundary fence 20 m Habitation 150 m	24 hours prior to baiting	All entry points For duration of baiting

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Jurisdiction	Specified Minimum Distances for Ground Baiting	Neighbour Notification	Warning Signs
	Domestic drinking water supply/ watercourse/ permanent water 20 m		
WA	Agricultural areas: Habitation 100 m Boundary fences 20 m Roads/reserves/public place 20 m Dams/watercourse 20 m Picnic/recreational sites 500 m Pastoral areas: Towns/settled area/dwelling 5 km Roads/public place 1km	72 hours prior to baiting	Not covered by state legislation – but the policy of Ag WA and CALM is all entry points. For duration of baiting and kept for a minimum of 1 month after baiting.

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Jurisdiction	Specified Minimum Distances for Ground Baiting	Neighbour Notification	Warning Signs
TAS	No wild dog baiting performed		

Watch this short video of the planning involved before undertaking an aerial baiting program in the NSW tablelands region. https://youtu.be/aYBkjHIH0vk

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