

Baiting of feral cats with para-aminopropiophenone (PAPP)

Standard Operating Procedure

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CAT004 – February 2020

Background

Feral cats (defined in Department of the Environment 2015) prey upon a wide range of mammals, birds, reptiles, amphibians and insects. In many bushland areas of Australia, especially many of the offshore islands, feral cats represent a significant threat to vulnerable and endangered native fauna. They may also have an indirect adverse impact on wildlife and livestock through the transmission of diseases such as toxoplasmosis and sarcosporidiosis. A variety of methods can be used to manage feral cat populations, including shooting, trapping, exclusion fencing and poison baiting with sodium fluoroacetate (commonly known as 1080) and para-aminopropiophenone (commonly known as PAPP).

Poison baiting is considered to be one of the most effective methods of broad-scale feral cat control and can provide large population reductions.

The CURIOSITY[®] bait delivers a PAPP formulation within a robust acid-soluble polymer pellet, known as the hard shell delivery vehicle (HSDV). A single HSDV, containing sufficient PAPP to kill a cat, is then incorporated into a moist meat bait.

Feral cats are amongst the most susceptible species to the effects of PAPP. However, feral cats rarely unearth buried baits and as such baits must be deployed on the ground surface. Poisoned baits are distributed either from the air by helicopter or fixed-wing aircraft or on-ground by hand.

The method of toxin delivery (i.e. the HSDV) helps to minimise the exposure hazard that CURIOSITY[®] bait presents to non-target species by exploiting differences in the dentition and feeding behaviours of cats and native wildlife.

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

Application

- Baiting with PAPP is best used in a strategic manner as part of a co-ordinated program designed to achieve sustained effective control.
- For feral cat baiting programs to be efficient and cost-effective, baits must be delivered at an appropriate time of year, such as when alternate prey species are less available, and at a label recommended rate (i.e. 50 baits/km²).

- It is preferable to undertake baiting programs between June and August in south-eastern Australia when feral cats are moving around as a result of food sources being scarce, thus increasing the likelihood of their finding and consuming baits.
- Baiting with PAPP should not be used in areas where there is an unacceptably high risk to companion animals, such as urban/residential landscapes.
- Baiting with PAPP should not be used in areas where there is a high risk of harm to wildlife. CURIOSITY[®] baits may be toxic to some native species. In areas where western quoll (chuditch, *Dasyurus geoffroii*) or spotted-tailed quoll (*Dasyurus maculatus*) may be present seek expert advice in relation to the presence of quolls and their habitat from regional level conservation/ environment/ wildlife management departmental personnel. DO NOT apply baits when goannas (Spp. *Varanus*) are known to be active. The risk to goannas may be reduced by limiting baiting to the cooler months in areas where cool winters are experienced or when mean maximum temperatures are expected to be ≤ 16°C.
- Baiting of feral cats with PAPP can only be carried out under conditions set down in the registration of the product by the Australian Pesticides & Veterinary Medicines Authority (APVMA) under Commonwealth legislation (*Agricultural and Veterinary Chemicals Code Act 1994*). PAPP must also be used in accordance with relevant state, territory and other Commonwealth legislation. The CURIOSITY[®] bait user may also need to make a referral under the EPBC Act (*Environment Protection and Biodiversity Conservation Act 1999*) if listed wildlife species are present in the proposed bait cell. See *Appendix* for a link to the legislation.
- CURIOSITY[®] baits are 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 PAPP, along with specific regulations regarding labelling or availability.
- CURIOSITY[®] baits can only be obtained through authorised locations or people. See *Appendix* for a link to the legislation for your state or territory.

Animal welfare considerations

Impact on target animals

- PAPP causes oxidation of haemoglobin in red blood cells which results in the formation of high levels of methaemoglobin. The oxygen carrying capacity of the blood is markedly reduced which leads to a lethal deficit of oxygen (termed *hypoxia* when oxygen levels are low or *anoxia* when oxygen is totally depleted) in the brain and heart, and results in lethargy followed by unconsciousness and death. Mammalian carnivores are highly susceptible to PAPP compared with other species such as birds.
- After a cat has ingested a CURIOSITY[®] bait, there is a lag period before signs of toxicosis such as head nodding, lethargy, ataxia (uncoordinated movement and difficulty maintaining balance). Salivation and sometimes vomiting are observed. The lag is associated with degradation of the HSDV polymer. Although the duration of the lag phase, duration and severity of symptoms and time to death can be highly variable, in a

pen study of 30 feral cats, the average lag period lasted for just under 4 hours, the average time from onset of signs to collapse was 74 mins and the average time from collapse to death was 110 minutes. Cats collapse and become unconscious as the toxicoses progresses.

Impact on non-target animals

- Poisoning of non-target species can occur when non-target animals ingest the HSDV from baits intended for feral cats (primary poisoning). In addition to feral cats, PAPP is toxic for domestic cats and dogs and may also pose a risk to several native species including varanid lizards (goannas), some marsupial carnivores (e.g. Tasmanian devils, possibly spotted-tailed quolls), and possibly southern brown bandicoots.
- The hazard associated with secondary poisoning (i.e. poisoning that occurs through the scavenging of tissues or entrails from a poisoned animal) from PAPP is thought to be virtually nil because there is nil accumulation of PAPP in the tissue of poisoned animals. However, it is possible that species such as goannas, that are susceptible to primary poisoning, may be susceptible to secondary poisoning if they scavenge from the stomachs of fresh carcasses.
- Each bait contains an amount of PAPP (ca. 78 mg) which is sufficient to deliver a lethal dose to a cat. The rate is calculated to minimise sub-lethal doses and overdosing.
- To minimise the potential for toxic baits to be lethal to non-target animals, the following baiting strategies are recommended:
 - *Timing of baiting* – this must be adjusted to reduce exposure to potentially susceptible species. For example, baiting in winter months when temperatures are $\leq 16^{\circ}\text{C}$ (south-east Australia), when reptiles are less active.

First aid for dogs and cats

- Feral cat baits are highly attractive to other carnivores. Care must be taken to ensure that working dogs and domestic pets do not come into contact with feral cat baits.
- The PAPP dose in a single CURIOSITY[®] bait is sufficient to kill a feral cat and this could also be lethal for smaller dogs but is not sufficient to kill a large dog. However, normal protective measures (e.g. use of muzzles or restraint) are required for all dogs regardless of size.
- The prognosis for poisoned dogs or cats is extremely poor unless an antidote (methylene blue) is promptly (preferably no more than 30 minutes after ingestion) administered by a veterinarian. You will need to act immediately to save a poisoned working dog, pet dog or pet cat – take your dog or cat to a vet immediately. Avoid extremes of temperature and keep your dog or cat as calm and quiet as possible. If the dog or cat is still able to stand it may be possible to induce vomiting—to get the bait out –by giving it an emetic by mouth e.g. salty water (2 teaspoons of salt in a cup of water) or 3 to 5 ‘washing soda’ (sodium carbonate) crystals (DO NOT use ordinary laundry detergent or powder). However, if the dog or cat cannot stand then do not attempt to induce vomiting.
- Veterinary intervention aims to reduce methaemoglobin back to haemoglobin (usually with methylene blue, although this too can be toxic in high doses), provide oxygen and respiratory support and to absorb toxin (with activated charcoal) and promote its excretion (with saline or sorbitol).

Health and safety considerations

- Operators using PAPP baits must follow strictly the directions on the approved label when using, storing, transporting or disposing of the baits.
- For further information on PAPP refer to the Material Safety Data Sheet (MSDS), provided by the manufacturer.

Equipment required

Poisoned baits

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

Baits must be laid according to requirements specified by the relevant state/territory authority.

- CURIOSITY® baits must only be supplied to and used by personnel authorised by the relevant state or territory government authority or persons under their direct supervision.
- A single bait contains sufficient toxin to be lethal to a target feral cat. CURIOSITY® baits contain ca. 78mg of PAPP in a 24g bait.
- Baits must be stored and transported in a secure and safe manner. It is best to obtain baits only when they are required.
- Baits must be kept, stored or transported in a container bearing the original label, as supplied by the manufacturer. They must be stored in the closed, original container in a refrigerator or freezer in a secure area that is only accessible by authorised users and away from children, pets and foodstuffs.

Other equipment

- personal protective equipment
- towel, soap, dish or bucket and water
- first aid kit
- warning signs
- metal racks or other means to sweat baits before deployment
- appropriate insecticide (e.g. Coopex®) to apply as an ant deterrent
- aircraft for aerial deployment
- monitoring camera or equipment for other monitoring methods

Procedures

Notification and warning signs

- Neighbour notification and signage requirements may vary from state to state, therefore it is essential that bait users familiarise themselves with the requirements specified by the relevant state/territory authority.
- All adjoining landholders must be notified of a baiting program at least 72 hours in advance and a record of the notifications must be kept.
- Warning signs are compulsory for all lands where baiting occurs. Landholders and neighbours should be advised of the risks to humans and non-target animals associated with PAPP use. As PAPP is lethal to domestic dogs it is advisable that they be muzzled or restrained for the length of the program and for a suitable period after baiting when viable baits are likely to be present. Cats are also susceptible to PAPP poisoning and should be confined to prevent them from eating baits. Depending on environmental conditions baits can remain potentially lethal for many weeks.
- Warning signs must be erected at all entry points before laying baits. Each sign must include the date laid, which toxin has been used, and for which pest animal, and contact numbers for further queries. Signs must remain up for a minimum of 4 weeks from the last day of baiting.

Distance restrictions

- The specified minimum distances that PAPP baits can be laid from habitation, watercourses, boundary fences and roads etc. must be observed.
- Ground baiting: Baits must be placed no closer than 150 m from a residential dwelling; 20 m from permanent or flowing water bodies; 5 m from all boundary fences and 5 m from the edge of formed public roadways or as specified by a State/Territory Government.
- Aerial baiting: Baits must be placed no closer than 150 m from a residential dwelling; 20 m from permanent or flowing water bodies; 500 m from all property boundaries and constructed recreational sites; and 250 m from the edge of formed public roadways or as specified by a state/territory government.
- Requirements may vary from state to state, therefore it is essential that bait users familiarise themselves with the requirements specified by the relevant state/territory authority.

Laying of baits

- Baits must be laid using ground or aerial application. The baits must be laid on the ground surface and are not suitable for burial. Apply single baits as evenly as possible at a rate of 50 baits per km².
- For ground baiting, individual baits should be placed on the surface of the ground at intervals of at least 100m; the rates of lay for ground baiting must not exceed 50 baits/km². Ground baiting baits are usually placed along vehicle tracks, other linear features or in locations known to be frequented by feral cats. When ground baiting, a

GPS (or marker tape and/or pegs) may be used to record bait locations so that baits can be recovered if not taken.

- For aerial baiting, baits should be dispersed at a density of 50 baits/km². Aerial baiting may be conducted by fixed wing or helicopter with recommended pre-defined flight lines spaced at either 500m or 1km intervals. Site specific considerations will define actual flight lines. GPS logging and the use of a dispensing carousel will assist in the even placement of baits. For example, with a fixed wing flying at 135 knots at a height of 500 feet, 5 baits are delivered every 3 seconds with a 500m spacing between flight lines to provide a density of 50 baits/km².
- At the conclusion of the baiting program all unused baits containing Hard Shell Delivery Vehicles and unconsumed baits able to be found must be disposed of by burial at least 0.5m deep in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots.

Procedural notes

- Information on non-target animal distribution, conservation status, habitat preference, diet, tolerance to PAPP, body weight and size of home range can be used to reduce poisoning risks posed by baiting programs. Time baiting when non-target species are least active or least susceptible. In order to assess the risk posed to non-target species posed by baiting programs, determine non-target animals in the control area. A desktop risk assessment for all species, available on the Australian Government Department of the Environment and Energy website (see appendix), may provide assistance, but should not be solely relied on.
- The length of time that baits contain a lethal dose of PAPP is variable and depends on factors such as how the baits are laid, rainfall or humidity and temperature. Bait degradation studies have shown that baits will remain attractive to feral cats for approximately 10-14 days. After this time the bait is likely to be dried hard, mouldy and rancid or consumed by ants. Once the meat bait has degraded, the hard shell delivery vehicle (HSDV) containing the PAPP toxin is unlikely to be found and consumed by any animal. The HSDV will ultimately degrade and allow the PAPP toxin to convert into NO_x, CO₂/CO + H₂O.
- Users of PAPP must always refer to the relevant federal, state and territory legislation for more detailed and up-to-date information on conditions of use including distance restrictions, public notification, distribution, storage, transportation and disposal of baits.

Further information

Contact the relevant federal, state or territory government agency from the following list of websites:

Australian Government Department of Agriculture, Water and the Environment

www.awe.gov.au

ACT Environment, Planning and Sustainable Development Directorate

www.environment.act.gov.au

NSW Department of Primary Industries

www.dpi.nsw.gov.au

NT Northern Territory Government

www.nt.gov.au/environment

Qld Department of Agriculture and Fisheries

www.daf.qld.gov.au

SA Primary Industries and Regions SA

www.pir.sa.gov.au/biosecurity

TAS Department of Primary Industries, Parks, Water and Environment

www.dpipwe.tas.gov.au

VIC Agriculture Victoria

www.agriculture.vic.gov.au

WA Department of Agriculture and Food

www.agric.wa.gov.au

Also refer to:

- Centre for Invasive Species Solutions
www.invasives.com.au
- PestSmart Connect
www.pestsmart.org.au
- Australian Pest and Veterinary Medicines Authority
www.apvma.gov.au

Further Reading

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Appendix

Relevant federal, state and territory legislation for the use of PAPP

Federal

Agricultural and Veterinary Chemicals Act 1994
Environment Protection and Biodiversity Conservation Act 1999

Australian Capital Territory

Environment Protection Act 1997

New South Wales

Pesticides Act 1999

Northern Territory

Medicines, Poisons and Therapeutic Goods Act 2012
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

Western Australia

Poisons Act 1964
Poisons Regulations 1965