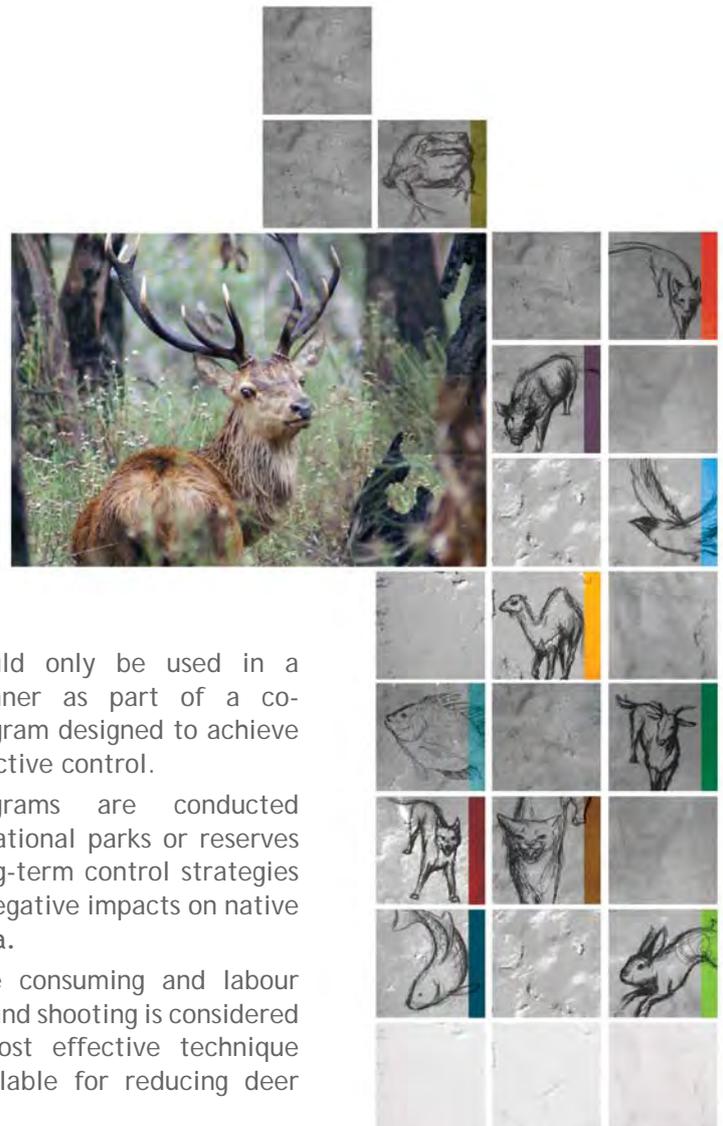


Standard Operating Procedure DEE001: Ground shooting of feral deer

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Background

Australia has feral populations of six deer species from three genera: fallow deer (*Dama dama*); red deer (*Cervus elaphus*); sambar deer (*Cervus unicolor*); rusa deer (*Cervus timorensis*); chital deer (*Axis axis*); and hog deer (*Axis porcinus*). Feral deer can damage native plants, crops and plantation trees and are a potential reservoir and vector of endemic and exotic diseases. While feral deer are considered a pest in some areas, they are also valued as a recreational and commercial hunting resource. Control methods include mustering, exclusion fencing, use of repellents, ground shooting and aerial shooting.

Most non-recreational ground shooting of feral deer is undertaken as part of culling programs in national parks and reserves. Such shooting is usually done at night from a vehicle, with the aid of spotlights. It is best suited to accessible areas where large numbers of deer congregate at night and where the impact of deer is greatest.

Shooting can be a humane method of killing feral deer when it is carried out by experienced, skilled shooters; the animal can be clearly seen and is within range; and, the correct firearm, ammunition and shot placement is used.

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 OH&S) operating in the relevant jurisdiction.

Application

- Shooting should only be used in a strategic manner as part of a co-ordinated program designed to achieve sustained effective control.
- Control programs are conducted primarily in national parks or reserves as part of long-term control strategies for reducing negative impacts on native flora and fauna.
- Although time consuming and labour intensive, ground shooting is considered to be the most effective technique currently available for reducing deer populations.
- Ground shooting as a means of population control is not suitable in inaccessible or rough terrain where sighting of target animals and accurate shooting is difficult or when wounded animals cannot easily be followed up and killed.
- Shooting of feral deer should only be performed by skilled operators who have the necessary experience with firearms and who hold the appropriate licences and accreditation.
- Storage and transportation of firearms and ammunition must comply with relevant legislative requirements.
- This procedure is only applicable to the control of deer populations by authorised personnel within managed parks and reserves. Recreational hunting of deer is regulated by the relevant state agencies with the legal requirements for deer hunting laid out in their governing legislation.

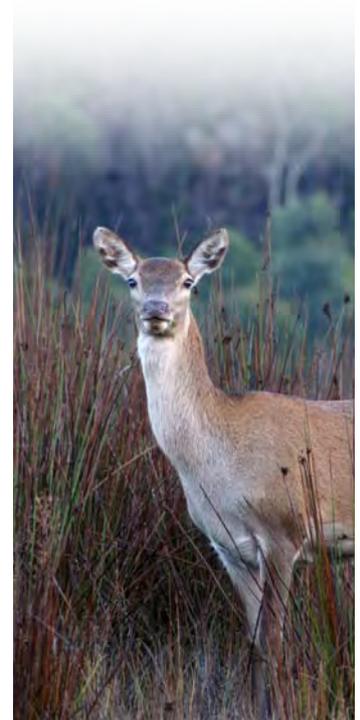


Image: Daryl Panther





DEE001: Ground shooting of feral deer



Image: Paul McLeish

Animal welfare considerations

Impact on target animals

- The humaneness of shooting as a control technique depends almost entirely on the skill and judgement of the shooter. If properly carried out, it is one of the most humane methods of killing feral deer. On the other hand, if inexpertly carried out, shooting can result in wounding which may cause considerable pain and suffering.
- Shooting must be conducted with the appropriate firearms and ammunition and in a manner which aims to cause immediate insensibility and painless death.
- When shooting at an animal it must be clearly visible and able to be killed with a single shot.
- Only head (brain) or chest (heart-lung) shots must be used. Shots to the head are preferred over chest shots as they are more likely to cause instantaneous loss of consciousness. Chest shots do not render the animals instantaneously insensible and are likely to result in a higher incidence of wounding. Shooting at other parts of the body is unacceptable.
- Herd flight response is a limiting factor for humane and instantaneous killing of deer. To keep stress to a minimum, shooting operations should occur on moonless nights with the aid of spotlights. A red filter fixed over the spotlight may reduce the amount of light seen by the deer. Silenced rifles may also reduce animal disturbance and facilitate accurate shooting.
- All species apart from Sambar and Hog deer tend to be found in groups.

- When possible, all deer in a group should be killed before any further groups are targeted. The smallest groups and within these fawns/calves should always be targeted first.
- Wounded deer must be located and killed as quickly and humanely as possible with a second shot preferably directed to the head. If left, wounded animals can escape and suffer from pain and the disabling effects of the injury. Note that Sambar deer can run considerable distances even when severely injured so they may be difficult to locate.
- Female deer will often hide newly born young until they are old enough to be mobile. To minimise the risk of missed dependant young suffering a slow death from starvation, shooting programs should not be undertaken when females are calving/fawning. This will vary depending upon the species of deer:
 - *Rusa*: calves may be born at any time of year but there is a peak in March to April.
 - *Fallow*: fawns are usually born in November or December.
 - *Red*: breeding is regular, calves are born from late November to December.
 - *Sambar*: calves may be born at any time of year but there is a peak in May and June.
 - *Chital*: breeding is not sharply defined, fawns are observed in April and May and from September to November.
 - *Hog*: irregular breeding, fawns are more frequently seen between August and October.
- If lactating females are inadvertently shot, efforts should be made to find dependent young and kill them quickly and humanely with a shot to the brain. Behavioural cues such as vocalising, travelling in a different direction or grazing away from the herd can be useful to determine if females have hidden calves/fawns nearby.
- Dogs should not be involved in any phase of deer culling programs. Deer are easily distressed and frightened by dogs and may injure themselves by running into fences and other obstacles.

Impact on non-target animals

- Shooting is relatively target specific and does not usually impact on other species. However, there is always a risk of injuring or killing non-target animals, including livestock, if shots are taken only at movement, colour, shape, or sound. Only shoot at the target animal once it has been positively identified and never shoot over the top of hills or ridges.

Health and safety considerations

- All participants in the culling program should stand well behind the shooter when an animal is being shot. The line of fire must be chosen to prevent accidents or injury from stray bullets or ricochets.
- Firearm users must strictly observe all relevant safety guidelines relating to firearm ownership, possession and use.
- Firearms must be securely stored in a compartment that meets State legal requirements. Ammunition must be stored in a locked container separate from firearms.
- Shooting from a vehicle is potentially dangerous. An agreed safety procedure between the shooter and others in the vehicle must be in place to ensure that people do not enter the field of fire or disturb the taking of a shot.
- Adequate hearing protection should be worn by the shooter and others in the immediate vicinity of the shooter. Repeated exposure to firearm noise can cause irreversible hearing damage.
- Safety glasses are recommended to protect the eyes from gases, metal fragments and other particles.
- Warm, comfortable clothing and stout footwear is recommended when shooting at night.
- Care must be taken when handling feral deer carcasses as they may carry diseases such as salmonellosis and yersiniosis that can affect humans and other animals. Routinely wash hands and other skin surfaces contaminated with blood and other body fluids. Carcasses can be heavy, so care must be taken when lifting/dragging.

Equipment Required

Firearms and ammunition

- Large calibre, high powered centre-fire rifles fitted with a telescopic sight should be used. Conventional hollow-point or soft-nosed ammunition is adequate with good shot placement although controlled expansion projectiles are preferred to achieve greater penetration and weight retention and thus a rapid and humane death.
- The calibre of rifle used will depend on the size and species of deer:
 - *Small deer (hog and fallow deer)*: The minimum calibre is .243 with 100 grain projectile. Case length must be at least 51 mm. Smaller calibres (.222 or .223) with 70 grain ammunition may be adequate in skilled hand for smaller animals.

- *Large deer (chital and red deer including hybrids eg wapiti and rusa)*: The minimum calibre is .270 with minimum 130 grain projectile. Case length must be at least 51 mm.
- *Sambar deer*: The minimum calibre is .308 with minimum 150 grain projectile. Case length must be at least 51 mm.
- An appropriate silencer fitted to the rifle (where allowed by a special permit).
- Shotguns are NOT recommended for use on feral deer. If they must be used in an emergency situation to reduce the suffering of injured or wounded deer, then a 12 bore gauge with rifled slugs or SSG ammunition should be used, but the animal must be no more than 30 m away.
- The accuracy and precision of firearms should be tested against inanimate targets prior to the commencement of any shooting operation.

Other equipment

- spotlight (100 watt) fitted with red filter
- lockable firearm box
- lockable ammunition box
- personal protective equipment (hearing and eye protection)
- first aid kit
- appropriate maps identifying access trails and land tenure

Procedures

- Deer must NOT be shot from a moving vehicle or other moving platform as this can significantly detract from the shooters' accuracy.



Image: Justin Bateman



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- It is recommended that during daylight hours shooters familiarise themselves with the terrain they are to cover. Take note of potential hazards and also any landmarks that may help with navigation.
- Shooting over the top of hills or ridges produces unacceptable risk. Be aware that the spotlight only illuminates a small portion of the danger zone and only a fraction of the projectile's range.
- Ensure you are in a firm, safe and stable position before taking a shot.
- The objective is to fire at the closest range practicable in order to reduce the risk of non-lethal wounding. Accuracy with a single shot is important to achieve an immediate and, therefore, humane death.
- A deer should only be shot at when:
 - it is stationary and can be clearly seen and recognised;
 - it is within the effective range of the firearm and ammunition being used; and
 - a humane kill is probable. If in doubt, do NOT shoot.
- Ensure there are no other deer behind the target animal that may be wounded by the shot passing through the target.
- Although deer are comparatively large animals, the vital areas targeted for clean killing are small. Shooters should be adequately skilled i.e. be able to consistently shoot a group of not less than 3 shots within a 10cm target at 100 metres. Shooters should also be able to accurately judge distance, wind direction and speed and have thorough knowledge of the firearm and ammunition being used.
- The shooter must aim either at the head, to destroy the major centres at the back of the brain near the spinal cord or, at the chest, to destroy the heart, lungs and great blood vessels. This can be achieved by one of the following methods (see Diagrams 1, 2 and 3):

Head Shot

Frontal position (front view)

This is the preferred method for fawns/calves.

- The firearm is aimed at the middle of the forehead at the crossing point of two imaginary lines drawn from the eyes to the tops of the opposite ears. The bullet should be directed horizontally into the skull. In stags this point is found between, and sometimes just behind, the antlers.

Temporal position (side view)

This method is preferred for mature/older animals.

- The firearm should be aimed at the side of the head so that the bullet enters the skull at a point midway

between the eye and the base of the ear on the same side of the head.

Rear of the head

This method is preferred for mature/older animals that cannot be approached from the side.

- The firearm should be aimed at the back of the head at a point just behind the base of the antlers and directed towards the animals' muzzle.

Chest Shot

Side view

- The firearm is aimed horizontally at the centre of a line encircling the minimum girth of the animal's chest, immediately behind the forelegs. The shot should be taken slightly to the rear of the shoulder blade (scapula). This angle is taken because the scapula provides partial protection of the heart from a direct side-on shot.

Front view

- The firearm is aimed horizontally at the point midway between the forelegs and immediately below the base of the throat.
- Frontal chest shots should only be taken when the animal is in the head high position.

- Shooting of individuals should stop when the flight response of the herd limits further accurate shooting.
- Fawns/calves and juveniles should be shot before shooting mature deer.
- The target animals in a group should be checked to ensure they are dead before moving on to the next group of animals. Always approach the animal from the dorsal (or spinal) side to prevent injury from the involuntary kicking legs. Death of shot animals can be confirmed by observing the following:
 - Absence of rhythmic, respiratory movements
 - Absence of eye protection reflex (corneal reflex) or 'blink'
 - A fixed, glazed expression in the eyes and
 - Loss of colour in mucous membranes (become mottled and pale without refill after pressure is applied).
- If death cannot be verified, a second shot to the head should be taken immediately.
- If the carcasses are to be donated or sold for secondary use eg for feeding large carnivores at zoos, wildlife parks etc, they should be exsanguinated or 'bled-out' (carotid arteries and jugular veins cut) as soon as possible following shooting.

Diagram 1: Recommended shot placements for feral deer

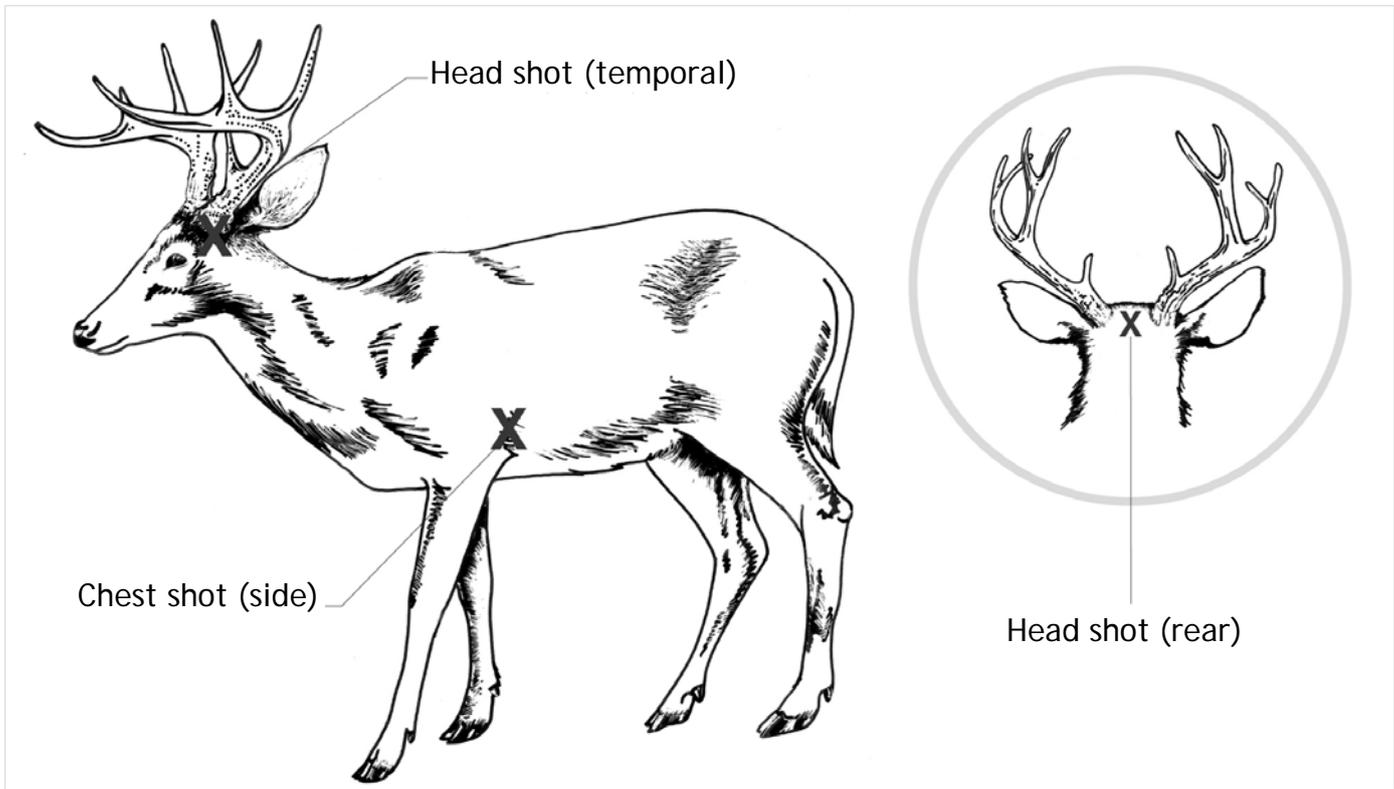


Diagram 2: Side view (skeleton)

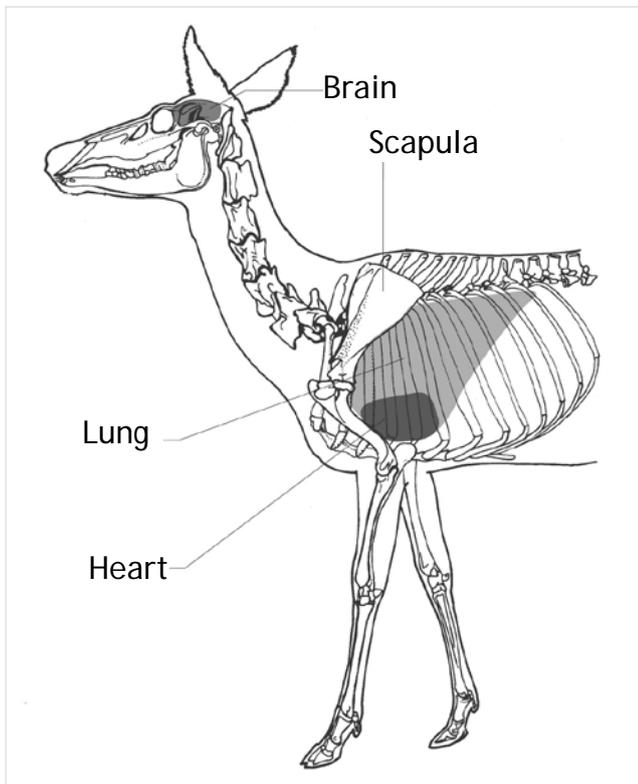


Diagram 3: Head shot (frontal)





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Further information

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

- Australian Department of Sustainability, Environment, Water, Population and Communities
<http://www.environment.gov.au/>
- Australian Department of Agriculture, Fisheries and Forestry
<http://www.daff.gov.au>
- ACT Territory and Municipal Services Directorate
<http://www.tams.act.gov.au/live/environment>
- NSW Department of Primary Industries
<http://www.dpi.nsw.gov.au/>
- NT Department of Land Resource Management
<http://lrm.nt.gov.au/>
- Qld Department of Agriculture, Fisheries and Forestry
<http://www.daff.qld.gov.au/>
- Biosecurity SA, SA Department of Primary Industries and Regions
<http://www.pir.sa.gov.au/biosecuritysa>
- Tas Department of Primary Industries, Parks, Water and Environment
<http://www.dpiw.tas.gov.au/>
- Vic Department of Primary Industries
<http://www.dpi.vic.gov.au/>
- WA Department of Agriculture and Food
<http://www.agric.wa.gov.au>

Also refer to:

- Invasive Animals Cooperative Research Centre
<http://www.invasiveanimals.com/>
or <http://www.feral.org.au>

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