

NSWGOAT SOP1

Ground shooting of feral goats

Background

Ground shooting of feral goats is undertaken by government vertebrate pest control officers, landholders and professional or experienced amateur shooters. It is best suited to accessible areas with high feral goat populations and is mainly used in forested areas and open pastoral areas, often as a follow-up after initial reduction of goat numbers by mustering or aerial shooting. Shooting from a helicopter is considered a more humane control method, as mobile wounded animals can be promptly located and killed. It is also a more effective method of quickly reducing feral goat populations. Refer to *NSWGOAT SOP2 Aerial shooting of feral goats*.

Shooting can be a humane method of killing feral goats when it is carried out by experienced, skilled shooters, the animal can be clearly seen and is within range, the correct firearm, ammunition and shot placement is used, and wounded animals are promptly located and killed.

This standard operating procedure (SOP) is a guide only. It does not replace or override the relevant NSW legislation. 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

- Ground shooting should only be used in a strategic manner as part of a coordinated program designed to achieve sustained, effective control.
- Ground shooting 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.
- Ground shooting is time consuming and labour intensive, often with low efficiency especially during moist climatic conditions. It is therefore not considered an effective method for large-scale control.
- The optimal period for ground shooting is during dry seasons or droughts, when many groups of goats are forced to congregate around areas with limited access to water and feed. The effectiveness of ground shooting becomes limited when animals have dispersed after rain and/or the number of goats becomes low.

- The use of radio-collared Judas goats to locate feral herds increases the effectiveness of ground shooting control operations. Refer to *NSWGOAT SOP5 Use of Judas goats*.
- Trained dogs are sometimes used to detect, herd or flush out feral goats prior to shooting. It is unacceptable to set a dog onto a goat with the intention of bringing it down, holding or attacking it.
- Shooting of feral goats 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 (See, [Firearms Regulation 2017](#)).

Animal welfare implications

Target animals

- The humaneness of shooting as a control technique depends almost entirely on the skill and judgement of the shooter. If properly done, it is one of the most humane methods of killing feral goats.
- Shooting must be done with the appropriate firearms and ammunition and in a manner that aims to cause immediate insensibility and quick death.
- When shooting an animal, it must be clearly visible and able to be killed with a single shot due to the difficulty of follow-up shots from the ground, particularly in difficult terrain. A solid rest or support should be utilised to ensure accurate shot placement.
- Only head (brain) or chest (heart-lung) shots must be used. A well-placed shot to the head to destroy the brain will result in instantaneous insensibility and a quicker death compared to a well-placed shot to the chest. Chest shots to destroy the heart can present challenges for accurate placement and may not always result in rapid death. For this reason, under ideal conditions, head shots are preferred over chest shots, however in some situations (e.g., where close approach is not possible; the head is obstructed or cannot be targeted; the animal is already wounded; or a second 'follow-up' shot can be quickly taken), because the chest is a larger target, a chest shot may be the most suitable option. Shooting at other parts of the body is unacceptable.
- Correctly placed head shots cause brain function to cease, and insensibility will be immediate. Death from a shot to the chest is due to massive tissue damage and haemorrhage from major blood vessels. Insensibility will occur sometime after, from a few seconds to a minute or more. If a shot stops the heart functioning, the animal will lose consciousness very rapidly.
- The shooter must be certain that each animal or defined group of animals is dead by physical inspection before another is targeted.
- Wounded goats 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 (including sickness due to infection).

- If lactating females are shot, reasonable efforts should be made to find dependent young and kill them quickly and humanely with a shot to the brain. Note that kids are not always easy to find — approximately half of mothers ('stayers') tend to stay in the vicinity of the newborn kid, while others ('leavers') leave them alone to forage. Lactating females tend to be found away from the mob. If kids are bigger, they will often be found with the mother.
- If herding/sheep dogs are used to flush feral goats out from heavily forested areas, they must be muzzled and/or adequately controlled to prevent them from attacking goats. If a dog fastens onto a goat and causes injury, the dog must be restrained and where necessary if the injuries are severe, the goat immediately killed by shooting.

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 as other animals or people may be out of sight beyond the hill in the danger zone.
- Shooting should be used with caution around lambing paddocks as it might disturb the lambing flock and cause mismothering. Also avoid paddocks containing sensitive livestock e.g., horses or farmed deer. They are easily frightened by spotlights and gunshots and could injure themselves by running into fences and other obstacles.

Workplace health and safety considerations

- Firearms are hazardous. Everyone 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.
- The shooter and others in the immediate vicinity should wear adequate hearing protection to prevent irreversible hearing damage, and safety glasses to protect eyes from gases, metal fragments and other particles.
- Care must be taken when handling goats as they can carry diseases such as Q fever and scabby mouth (also known as orf virus) that can affect humans and other animals. Routinely wash hands after handling goats or goat carcasses.
- Operators working with goats and goat carcasses are at risk of contracting Q fever. They can become infected when they inhale droplets of urine, milk, faeces or birth products from infected animals. Infection can also occur from inhalation of aerosols created during slaughter of infected animals or dust from contaminated materials. Blood testing of personnel is recommended to assess previous exposure, followed by vaccination for susceptible individuals.

Equipment required

Firearms and ammunition

- Large calibre, high velocity centre-fire rifles fitted with a telescopic sight must be used. The minimum firearm and ammunition requirements for the ground shooting of feral goats are:
 - calibre: .243 inches
 - bullet weight: 80 grain
 - muzzle energy: 1819 (ft-lbs)
- Examples of acceptable firearm and ammunition combinations with maximum shooting distances are included in the table below:

Cartridge *	Bullet weight (gr)	Muzzle velocity (ft/sec)	Muzzle energy (ft-lbs)	Maximum distance (metres)
.243	80	3200	1819	200
25-06 Rem	90	3350	2243	200
.308 Win	150	2820	2649	200

Source: <https://press.hornady.com/assets/pctumbs/tmp/1410995911-2019-Standard-Ballistics-Chart.pdf>

*Smaller calibres (.222 or .223) with 55 grain ammunition can be adequate in skilled hands for smaller goats (less than 40 kg)

- Rifle bullets must be of an expanding type designed to deform in a predictable manner e.g., hollow point, soft-point, polymer tip.
- 12-gauge shotguns with heavy shot sizes of SG or SSG, may be effective, but only up to a distance of 20 metres from the target animal.
- The accuracy and precision of firearms should be tested against inanimate targets before any shooting operation.

Other equipment:

- If shooting at night, a handheld spotlight, or a helmet or headband mounted 12-volt spotlight.
- Thermal/night vision monocular and scopes.
- First aid kit.
- Lockable firearm box.
- Lockable ammunition box.
- Personal protective equipment (hearing and eye protection).
- Appropriate maps identifying access trails and land tenure.
- Communication devices (2 way/mobile etc.) are recommended for safety reasons.

Procedures

- Feral goats must NOT be shot from a moving vehicle as this can significantly detract from the shooters' accuracy.
- The best time to shoot feral goats is when they are most active; that is, in the early morning and late afternoon.
- A feral goat 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
 - a humane kill is probable.
- If in doubt, do NOT shoot.

Target animal and point of aim

- The objective is to fire over 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.
- Although feral goats are comparatively large animals, the vital areas targeted for clean killing are small. Shooters should be highly skilled and experienced at shooting and be able to accurately judge distance, wind direction and speed and have a 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 also Figure 1)

Head Shot

- The horn structures on adult goats make the temporal (side-on) or rear head (poll) shots the preferred points of aim. Shots to the front of the head can be used on kids, but this method is not recommended for mature goats as the brain is located well back in the skull.

Temporal position (side view)

- The firearm should be directed at the side of the head so that the bullet enters the skull midway between the eye and the base of the ear. The bullet should be directed horizontally.

Rear of the head (poll)

- The firearm should be aimed at the back of the head at a point between the base of the horns and directed towards the throat and mouth.

Chest Shot

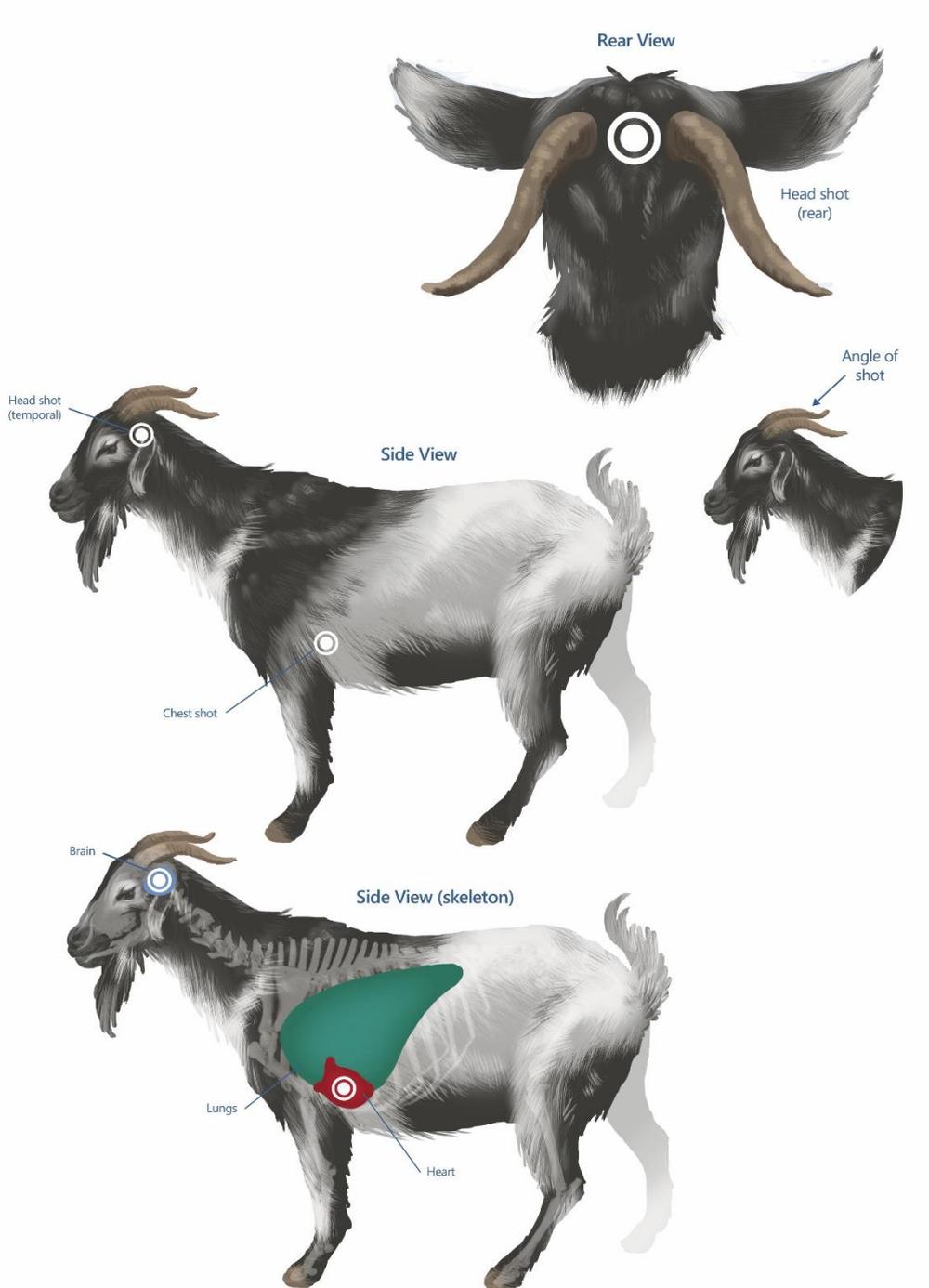
Front view

- The firearm is aimed horizontally at the point midway between the forelegs and immediately below the base of the throat. Frontal shots should only be used for animals in the 'head high' position.

Side view

- The animal is shot from the side so that the bullet enters the chest at a point behind the foreleg, slightly above and immediately behind the elbow joint.
- When using a rifle, the target animal must be stationary and within a range that permits accurate placement of the shot. Shots to the head are preferred over chest shots.
- When using a shotgun, the target animal can be stationary or mobile, but must be no further away than 20 metres from the shooter. The pattern of shot should be centred on the head or chest. It is essential that the distance to the target animal is accurately judged. To achieve adequate penetration of shot, the animal must be in range. It is recommended that shooters practise estimating distances before a shooting operation.
- Shoot the dominant and mature animals first or the leading animals if goats are escaping.
- The target animal should be checked to ensure it is dead before moving on to the next animal. *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 a combination of the following:
 - no heartbeat
 - no breathing
 - no corneal reflex (no blinking when the eyeball is touched)
 - no response to a painful stimulus (e.g., a pinch of the ear tip).
- If death cannot be verified, a second shot to the head should be taken immediately.

Figure 1: Shot placement for the ground shooting of feral goats



Note that shooting an animal from above or below the horizontal level as depicted here will influence the direction of the bullet through the body. Adjustment to the point of aim on the external surface of the body may need to be made to ensure that the angled bullet path causes extensive (and therefore fatal) damage to the main organs in the target areas.

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