

## NSWGOAT SOP3

# Mustering of feral goats

### Background

Mustering of feral goats is usually carried out on motorbike or horse with the aid of trained dogs, however light aircraft or helicopters are also used over more extensive terrain. Once mustered, the goats are usually held in enclosures and managed until they are sold for slaughter at abattoirs or for live export. Meat for export is the main product from feral goats, with sales providing an additional source of income to landowners, while also reducing pest density and environmental impact. Where removal may be costly or impractical (e.g., in conservation areas or areas without access to transportation), aerial shooting may be more efficient for reducing goat numbers (see *NSWGOAT SOP2 Aerial shooting of feral goats*).

This standard operating procedure (SOP) is a guide only. It does not replace or override NSW legislation. The SOP should only be used subject to the applicable legal requirements (including WHS) operating in NSW. This SOP covers up to the stage of livestock loading; refer to the [Australian Animal Welfare Standards and Guidelines — Land Transport of Livestock](#) thereafter.

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

- Mustering should only be used in a strategic manner as part of a coordinated program.
- Mustering is relatively labour intensive compared to trapping and can be more stressful to the goats.
- Mustering is only efficient and economic when goat densities are high. Many landholders therefore opportunistically muster when they notice large groups of goats on their land.
- Monitoring of goat numbers and resource degradation should determine the most suitable time to conduct goat control. In tablelands there might be times (usually in winter) when goats form larger mobs and so are more accessible.
- In relatively flat and accessible country, mustering is usually done on horseback or motorbikes and with the aid of dogs. In rough, hilly country and more extensive areas, helicopters or light aircraft can be used to drive the goats towards a set of yards where a ground team completes the muster.
- Not all goats from an area will be mustered. Some animals will be left behind, including does with young kids, and others that might have become scattered.

- The use of radio-collared Judas goats to locate feral herds increases the effectiveness of mustering control operations, particularly when eradication is the aim of the program (refer to *NSWGOAT SOP5 Use of Judas goats*).
- Trained herding/sheep dogs are sometimes used to muster feral goats. It is unacceptable to set a dog onto a goat with the intention of bringing it down, holding or attacking.
- To ensure that mustering, capture and handling is done with the least stress to the goats, operators must have a good knowledge of goat behaviour, including their movement patterns. They should also be familiar with the terrain they are to cover, so that dangerous areas can be avoided.
- Aircraft operators must ensure that their flying operations comply with requirements of the Civil Aviation Safety Authority.
- Where euthanasia is required, shooting of goats should only be done 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 legislation requirements.

## Animal welfare implications

### Target animals

- Mustering, capture and handling increase stress in feral goats, as they are not used to confinement or close contact with humans. As a result, these procedures can lead to mismothering, feeding disruption, social disruption, heat stress and also abortion in heavily pregnant females. Metabolic, nutritional and parasitic diseases and changes in environmental conditions are common causes of mortality and morbidity in confined feral goats.
- Mustering can have a significant negative impact on dependent young; therefore, mustering should be avoided when there is a high proportion of does in late pregnancy or with small kids at foot. Alternately if mustering has to occur, then allowing heavily pregnant does or does with young at foot to drop out of the mob will help to avoid or at least minimise severe animal welfare impacts. If unweaned kids are left behind when their mothers are mustered, they will suffer and likely die from starvation, predation or disease. Dependent young can also be trampled or injured in the yard or during transport. If females with dependent young are inadvertently mustered with a mob, or kids are born within the yard then dependent young must be euthanased quickly and humanely.
- Mustering should be carried out in the cooler months to avoid heat stress.
- The tail end of the mob should set the pace rather than being forced to keep up with the leaders. Distances that the goats have to be mustered should be kept to a minimum (e.g., by using portable yards).
- Feral goats should be handled quietly and without force, to avoid panic and trampling. Electric prods can only be used on animals that are over 6 months of age and must not be used on pregnant animals.

- Goats that are severely injured during mustering or confinement must be killed quickly and humanely with a rifle shot to the head or captive bolt gun where appropriate.
- Only trained working dogs are to be used to assist in the handling of feral goats. Trained sheep dogs such as kelpies are preferred, as they are not usually aggressive. As a precaution, muzzles can be fitted to dogs to prevent them causing bite injuries.
- Normal social groups should be maintained whenever possible and there should be sufficient holding yards to avoid mixing different groups of stock as this can result in fighting, stress and injury. Older males and goats with significant horns should be separated to avoid dominance behaviour and injury. Does and unweaned kids should be kept together.
- Only fit and healthy animals should be selected for transport. Heavily pregnant, very young or weak/sick/injured animals must either be euthanased or given proper veterinary assistance and moved at a later date when they are more suitable for transportation.
- The loading, transport, unloading, holding and slaughter of feral goats must be done with the minimum amount of stress, pain or suffering. Guidelines on these procedures can be found in relevant state or federal government guidelines. For example:
  - [Australian Industry Welfare Standards and Guidelines for Goats](#)
  - [Australian Animal Welfare Standards and Guidelines — Land Transport of Livestock](#)
  - [Australian Standards for the Export of Livestock](#)

### **Non-target animals**

- Mustering is target specific and has minimal impact on other species.
- Dogs used for mustering must receive adequate care at all times. This includes food, water, shelter, safe and comfortable transportation, current vaccinations, worming, flea, tick and heartworm prevention, where appropriate. For more details refer to [GEN002: The care and management of dogs used for pest animal control](#).

### **Workplace health and safety considerations**

- Care must be taken when handling goats, as they can carry diseases such as Q fever and scabby mouth (also known as orf) that can affect humans and other animals. Routinely wash hands and other skin surfaces 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.
- The mustering, trapping and handling of feral goats is not without risk to the operators involved. A first aid kit should be carried at all times and motor bike riders should wear helmets.

- Firearms are hazardous. All people should stand well behind or beside 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.

## Equipment required

### Yards

- Either portable or fixed holding yards can be used.
- The materials used must minimise the risks of injury or escape of goats once inside the enclosure. Projections such as loose wire or sharp edges likely to cause injury should be eliminated and fences should be secure and high enough to prevent goats escaping.
- Gates must be wide enough to allow the easy flow of animals, particularly bucks with large horns.
- Yards should be designed to minimise both dust and boggy conditions.
- If possible, yards should be positioned in a shady area with as much natural vegetation as possible. If mustering in extremes of climate (hot or cold) is unavoidable, shelter must be provided for goats. This is particularly important for young goats or animals in poor body condition during cold, windy and rainy conditions.
- Details of yard specifications and construction can be obtained from relevant state guidelines (e.g., [Yard Design for Goats](#)).

### Firearms/ammunition and captive bolt guns

- Smaller calibre rifles such as .22 magnum rimfire with hollow/soft point ammunition are adequate for euthanasia of goats at short range (within 5 m). If shooting animals from a greater distance refer to *NSWGOAT SOP1 Ground shooting of feral goats* for more detailed information.
- Penetrating captive bolts guns (e.g., Cash Special .22, Blitz Kerner .38) are suitable for euthanasia of restrained goats when used by trained and confident operators. The cartridge power and length/diameter of bolt must be appropriate for the species and age of animal.
- Captive bolts should be regularly cleaned and maintained in optimal working condition according to the manufacturer's instructions. Cartridge blanks must be stored properly so that the propellant does not deteriorate.

## Fixed wing aircraft or helicopter

- The aircraft must be suited to the purpose and must fulfil Civil Aviation Safety Authority (CASA) requirements for the task of mustering.
- The pilot must be suitably experienced and licensed and hold the appropriate endorsements for aerial mustering of stock.
- Aircraft operators must ensure that their flying operations comply with requirements of CASA.

## Procedures

### Choosing a yard site

- Yards should be located close to suitable water.
- A suitable yard site needs to be sufficiently flat to enable the erection of portable yards. If designed to be serviced by trucks, the yard should be set up in close proximity to suitable haulage roads and adjacent to sufficient space for trucks to turn.
- Yards should be set up in a location that prevents the goats from seeing them until it is too late for evasion, for example on the other side of scrub through which the goats are being pushed.
- Where possible, yards should be positioned in a shady area with as much natural vegetation as possible. However, avoid having trees near the entrance of the yards if using a helicopter.
- Yards must be well drained to allow goats to sit down in areas free of surface water after rainfall.

### Mustering

- Goats should not be chased but moved steadily with the slowest animals setting the pace. Goats should never be driven to the point of collapse.
- Only muster the number of goats that can be comfortably handled. The fewer goats that are included in any one operation and the shorter the distance travelled, the less stress will be placed upon the animals.
- Heavily pregnant females, females with small kids and other goats, such as those in poor condition, should be allowed to drop out of musters if the safety and welfare of the animals is at risk. Also, if a female goat continually breaks away and will not move along with the group, it is possible that she has a dependent kid/s hidden somewhere. It is best to let her go and move on with the rest of the group.

### Holding goats in yards

- Goats captured by mustering should be allowed at least 3–4 days rest with adequate shelter, food and water so that they become accustomed to lot-feeding before transport to a feedlot or depot. During this time they must be assessed daily for signs of injury,

disease, loss of appetite, illness or distress. Account must be taken of their possible unwillingness to drink and eat from troughs.

- Goats to be transported longer than 24 hours should be fed and watered during holding in the yards, and within five hours before loading.
- Goats should not be held in the holding yards for extended periods. If goats are being held for longer than 24 hours, they should be provided adequate shelter, food and water.
- Older males and goats with significant horns should be separated to avoid dominance behaviour and injury. Does and unweaned kids should be kept together.

## Transporting goats

Detailed requirements for the land transport of goats can be found in Animal health Australia (AHA) 2012, [Australian Animal Welfare Standards and Guidelines— Land Transport of Livestock](#).

## Euthanasia of goats in the yards

- It might be necessary to humanely kill goats in the following situations:
  - when there is no market for the captured goats (including smaller animals that are of no commercial value)
  - if goats have sustained serious injury during capture or in the holding yards
  - if there are dependent young that are separated from their mother
  - if there is a pre-existing disease or condition that would prevent the animal from being transported, slaughtered or domesticated.
- When large numbers of animals are to be killed in the holding yard, provisions should be made to dispose of carcasses in an appropriate manner (i.e., by burying and/or burning). Numerous guidelines are available that describe disposal methods.

## Shooting

- Shooting is the most acceptable method of euthanasia for goats and must be done to cause sudden and painless death with minimum distress to the animal. Only head shots are acceptable.
- The shooter should approach the animals in a calm and quiet manner. To prevent unnecessary agitation of the yarded goats, other people should keep away from the area until shooting is completed.
- To maximise the impact of the shot and to minimise the risk of misdirection, the range should be as short as possible.
- Never fire when the goat is moving its head. Be patient and wait until the goat is motionless before shooting. Accuracy is important to achieve a humane death. One shot should ensure instantaneous loss of consciousness and rapid death without resumption of consciousness.
- Shots must be aimed to destroy the major centres at the back of the brain near the spinal cord. The horn structures on adult goats make the rear (or poll) head shot the preferred

point 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.

- Rear (or poll) shots are performed by aiming the firearm at the back of the head at a point between the base of the horns and directed towards the throat and mouth.
- To ensure maximum impact and the least possibility of misdirection, projectiles should be fired at the shortest range possible, but not with the barrel in contact with the animal's head.
- 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.

### **Captive bolt gun**

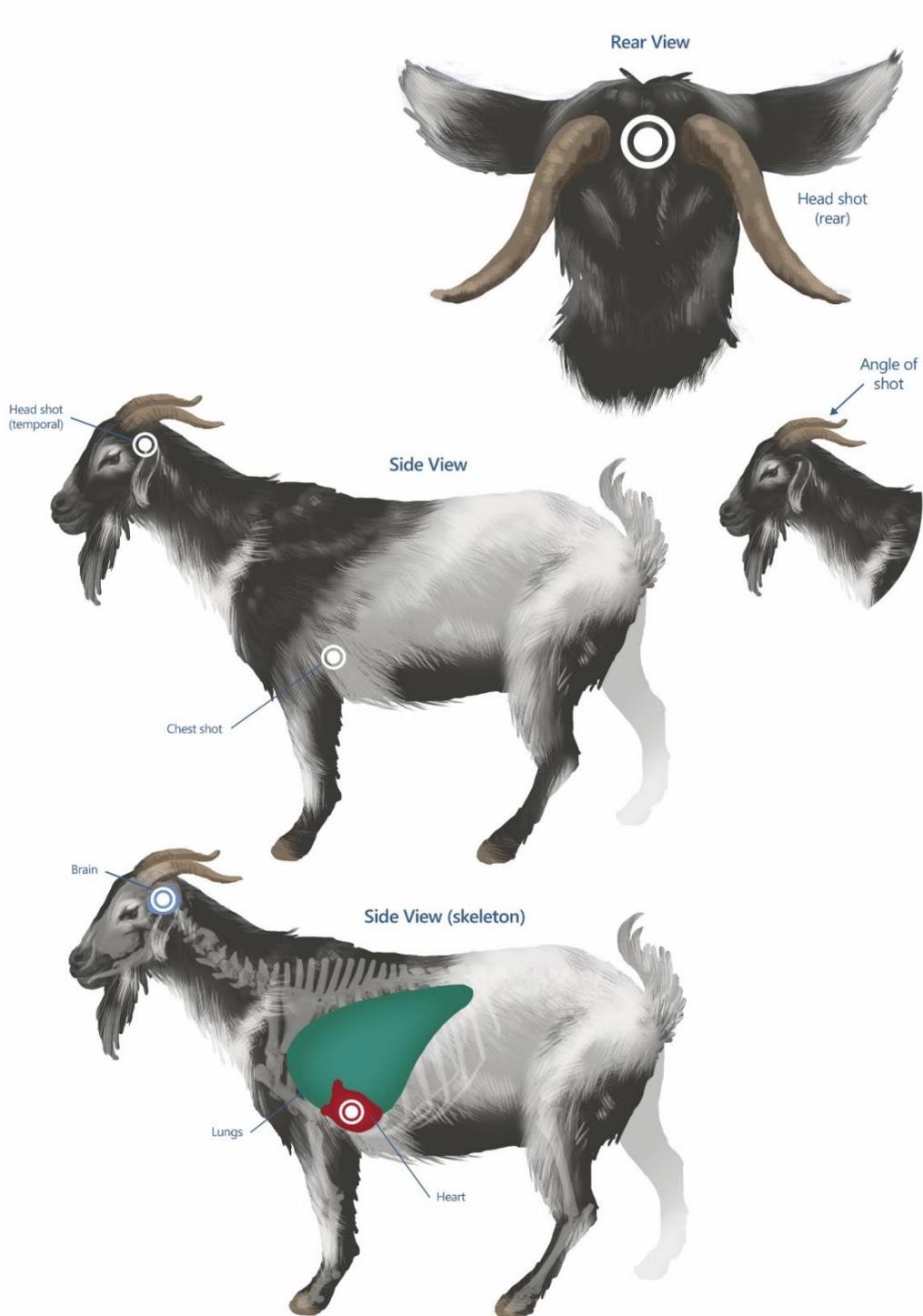
- In some situations (e.g., where it is unsafe to use a firearm) it may be more appropriate to use a captive bolt gun for euthanasia of goats.
- Captive bolts cause insensibility by disrupting the cerebral cortex, with death occurring due to disruption to the brain stem.
- Captive bolts must only be used by suitably trained operators who can confidently handle and operate the device and know the correct anatomical landmarks on the head. They must also be able to confirm death, recognise ineffective shots and take quick action when a shot goes wrong.
- A penetrating captive bolt gun is recommended because it is more reliable at delivering an effective stun.
- The animal must be well-restrained, and the captive bolt gun pressed firmly on the head in the *poll* position before being discharged. Frontal and crown shots must not be used.
- Captive bolt guns can only cause stunning, or loss of insensibility, that may be temporary and not lead to death. Stunning must therefore be followed by a secondary method to cause death, such as bleeding-out.

### **Euthanasia of neonatal dependent young**

- In some situations (e.g., when it is unsafe to use a firearm) it will be necessary to use an alternative method for euthanasia of dependent young that can be caught by hand. Acceptable methods are:
  - A penetrating captive bolt gun as described above.
  - A percussive, non-penetrating captive bolt device (e.g., CASH Small Animal Tool with a 1 grain cartridge; propane-powered TED device) - is effective for achieving stun/kill of neonatal goats (up to 48 hours old) when applied to the skull on the midline between the ears with the chin tucked into the neck.
  - A percussive blow to the head - can be used when a captive bolt device is not available but only on kids that are less than 24 hours old. Following the percussive

blow—when the animal is unconscious—bleeding out should be performed to ensure death.

Figure 3: Shot placement for feral goats. Head shot (rear/poll) should be used for euthanasia at close range. See text for details.



**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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