

# HOR003 mustering of feral horses

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## Background

Feral horses (*Equus caballus*) can cause significant environmental damage and losses to rural industries. Although considered pests, feral horses are also a resource, providing products such as pet meat for the domestic market and meat for human consumption for the export market. Control methods include trapping, mustering exclusion fencing, ground shooting and shooting from helicopters.

Feral horses are mustered by helicopter, motorbike or on horseback, sometimes with the assistance of coacher horses. Once mustered into yards, net traps or fenced paddocks, the horses are usually sold to abattoirs for slaughter which can offset the costs of capture and handling. Less commonly, they are sold as riding horses or relocated to reserves or horse sanctuaries. Where there is no market for them or where removal may be too costly or impractical e.g. in conservation areas or remote areas without access to transportation, horses are sometimes destroyed by shooting in the yards.

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

- Mustering should only be used in a strategic manner as part of a co-ordinated program designed to achieve sustained effective control.
- Mustering may only be efficient and economic when horse densities are high.
- In relatively flat and accessible country, mustering is usually performed by people on horses or on motorbikes. In rough, hilly country and more extensive areas, helicopters or light aircraft are used to drive the horses towards a set of yards where a ground team completes the muster.
- Musters are best centred on smaller areas which include the watering points or grazing areas that are of most importance to feral horses. Intensive mustering of a defined management area (of approximately 400km<sup>2</sup>) around a permanent watering point may offer the most effective way of catching most horses. Few horses would have to be pushed outside their normal home range.

- When mustering very large areas, many horses are pushed outside of their home range areas, which they resist leaving. Also, the greater the distance the horses are pushed, the more chance they have to escape. Those that get away will be harder to catch next time. Mustering of extensive areas should only be done if transport vehicle access is restricted by rough terrain, or if there are few suitable yard sites.
- Mustering is relatively labour intensive compared to trapping and can be more stressful to the horses.
- To ensure that mustering, capture and handling is performed with the least stress to the horses, operators must have a good knowledge of horse behaviour and movement patterns. They should also be familiar with the terrain they are to cover so that dangerous areas (e.g. sinkholes, bogs) can be avoided.
- Aircraft operators must ensure that their flying operations comply with requirements of the Civil Aviation Safety Authority.
- Shooting of horses 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 legislation requirements.

## Animal Welfare Considerations

### Impact on target animals

- Capture and handling increase stress in feral horses as they are not used to confinement or close contact with humans. Operators should endeavour to keep stress to a minimum during these procedures. Exposure to prolonged or excessive stress causes severe physiological effects and can result in the following conditions:
  - Capture myopathy;
  - Heat stress and dehydration;
  - Acute lameness due to injury or damage to tendons, ligaments or bones;
  - Fight injuries due to mixing unfamiliar groups or individuals;
  - Bruising and injury caused by rough capture techniques and poorly designed handling techniques;
  - Stress-induced infections, such as salmonellosis;
  - Feeding disruption resulting in ill-thrift or colic; and
  - Abortion in heavily pregnant females
- To avoid heat stress, mustering should be carried out when conditions are cool or mild. Mustering should not be conducted if horses are in poor body condition e.g. during droughts.
- The tail end of the mob should set the pace rather than being forced to keep up with the leaders. Distances that the horses have to be mustered should be kept to a minimum e.g. by using portable yards.
- Feral horses should be handled quietly without force to avoid panic and trampling.
- Horses that are severely injured during mustering or confinement must be killed quickly and humanely with a rifle shot to the head.

- Whenever possible avoid mustering when females are foaling or have young at foot. Unweaned foals may be left to die of starvation if their mothers are mustered and they are left behind. Foaling is concentrated over spring and summer. Apart from the welfare implications, control at times of foaling will reduce effectiveness as females are usually more cryptic and tend to leave the group to give birth in isolated locations
- Electric prods and dogs must not be used to assist in the handling of feral horses.
- Mixing unfamiliar groups or individuals in yards may result in fighting, stress and injury. Normal social groups should be maintained whenever possible. There should be sufficient holding yards to avoid mixing different groups of stock.
- Only fit and healthy animals should be selected for transport. Heavily pregnant, very young or weak/sick/injured animals must either be destroyed, proper veterinary assistance given or transported at a later date when they are more suitable for transportation.
- The loading, transport, unloading, holding and slaughter of feral horses must be undertaken with the minimum amount of stress, pain or suffering. Guidelines on these procedures can be found in the following documents:
  - Model Codes of Practice for the Welfare of Animals:
    - Land Transport of Horses (1997)
    - Livestock at Slaughtering Establishments, SCARM Report 79 (2002)
    - Killing or Capture, Handling and Marketing of Feral Livestock Animals (draft)
  - AQIS (1995). Operational guidelines for the welfare of animals at abattoirs and slaughterhouses. Australian Quarantine and Inspection Service. Australian Government Publishing Service, Canberra.

### Impact on non-target animals

- Mustering is target specific and does not usually impact on other species.

### Health and Safety Considerations

- During construction of yards, operators should be wary of the risks of injury from lifting heavy items. Leather gloves and eye protection will help prevent injuries from wire, steel posts and hammers.
- The mustering, confinement and handling of feral horses is not without risk to the operators involved. A first-aid kit should be carried at all times.
- Operators must be wary of horses especially when working with them in a yard. Beware of horses kicking directly backward with either or both hind feet. Horses can also strike, bite and crush people against fences.
- Firearms are potentially hazardous. All people should stand well behind the shooter when horses are 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/Territory legal requirements. Ammunition must be stored in a locked container separate from firearms.
- 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.
- When shooting, safety glasses are recommended to protect eyes from gases, metal fragments and other particles.
- Care must be taken when handling feral horse carcasses as they may carry diseases such as melioidosis, ringworm and dermatophilosis that can affect humans and other animals. Routinely wash hands and other skin surfaces after handling carcasses.

## Equipment Required

### Yards

- Either portable or fixed holding yards can be used. Many yards that are already established were originally designed for cattle rather than horses.
- The entrance should have winged fences to effectively direct horses into the yard. Hessian is usually run out from the yard for about around 100 metres to form part of the wing fences. This acts to prevent horses running into the fences. The wings should be further extended until they reach natural barriers such as the side of a range or a hill. Ribbon wings made out of flagging tape attached to twine are effective. To deflect approaching horses, one wing fence needs to longer than the other, commonly 500 metres to 1 km long.
- Net traps are sometimes used instead of yards. These are constructed of high strength fishing net with long hessian wing fences that funnel horses into the trap.
- Yards should be large enough for the horses to enter at a reasonable pace and pull up and settle before encountering fences and panels. Entrance gates must be wide enough (about 6 metres) to allow the easy flow of animals.
- The yard fencing should form both a physical and visible barrier to minimise the potential for injuries. Steel or timber post-and-rail fencing is recommended. Barbed wire and narrow gauge high tensile steel should not be used for fencing in closely confined situations as it can cause severe injury to horses.
- The materials used must minimise the risks of injury or escape of horses 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 horses escaping. Hessian hung above normal yard height can be used to deter horses from pressuring or jumping vulnerable parts of the yard such as the main gate.
- Yards should be designed to minimise both dust and boggy conditions.
- In extremes of climate (hot or cold) shelter must be provided for horses. This is particularly important for young horses or animals in poor body condition during cold, windy and rainy conditions.
- Details of yard design and construction can be obtained from relevant guidelines, for example:

- Dobbie, W. (1992). *Control of brumbies in central Australia*. Conservation Committee of the Northern Territory and the Northern Territory Department of Primary Industries and Fisheries, Alice Springs.
- Dobbie, W.R., Berman, D.McK. and Braysher, M.L. (1993) *Managing Vertebrate Pests: Feral Horses*. Australian Government Publishing Service, Canberra. Appendix A.
- McKiernan, B. (1999). Agfact A6.7.1 *Horse yards and handling facilities*. NSW Agriculture.

### Firearms and ammunition

- Smaller calibre rifles such as .22 magnum rimfire with hollow/soft point ammunition are adequate for euthanasia of horses at short range (< 5 metres). If shooting animals from a greater distance, a higher powered rifle will be required, refer to HOR001 *Ground shooting of feral horses* for more detailed information.

### Light fixed wing aircraft or helicopter

- The aircraft must be suited to the purpose and must be registered to perform the task.
- Small Robinson helicopters are popular because of their manoeuvrability. Ultralight aircraft could also be used with helicopters but they are less manoeuvrable than helicopters, and so may not be as effective
- The pilot must be suitably licensed and hold the appropriate endorsements for aerial mustering of stock.

## Procedures

### Choosing a yard site

- A suitable yard site needs to be flat to enable the erection of portable yards, and have sufficient space for trucks to turn.
- Yards should be set up on a stock trail to encourage horses to run along the trails which, ideally, should lead to the main entrance. Low spots should be avoided as horses prefer to run uphill. The approach to the yard should be flat or slightly uphill. The yard should not be easily visible to the horses until they are close to the entrance.
- If 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 as they can restrict manoeuvring of helicopters.

### Mustering

- It is preferable that mustering be carried out when conditions are cool or mild.
- Horses should not be excessively chased but moved steadily with the slowest animals setting the pace. Horses should never be driven to the point of collapse.
- Only muster that number of horses that can be comfortably handled. The less the number of horses included in any one operation, and the shorter the distance travelled the less stress is likely for the animals.
- ‘Coacher horses’, domesticated horses that are released amongst feral horses to quiet them, are sometimes used to assist with mustering.

- Horseback musters, involving skilled horse riders pursuing feral horses and directing them into the winged yards, are also occasionally used. However, this technique is not common as it requires very skilled riders and the capture success is low with only a few animals taken at a time.
- Heavily pregnant mares, mares with small foals and other horses, especially those in poor condition, should be allowed to drop out of groups that are being mustered if required to protect the safety and welfare of the animals. Also, if a female horse continually breaks away and will not move along with the group, it is possible that she may have a dependant foal hidden somewhere. It is best to leave her go and move on with the rest of the group.

### Holding horses in yards

- Horses captured by mustering should be allowed a minimum of 24 hours rest with adequate shelter, food and water before they are transported on journeys longer than 8 hours. During this time they must be assessed daily for signs of injury, disease, inappetence, illness or distress. Account must be taken of their possible unwillingness to eat feed they are not familiar with.
- Hosing down horses with water refreshes recently mustered horses and is essential in hot weather; it also has a quietening effect.
- Horses require 25 litres of water a day, although double this amount may be required in very hot weather (> 40°C). Addition of electrolytes to the drinking water is desirable for horses mustered in hot weather. Yarded horses require 6 kg of good quality hay a day.
- To minimise stress and injury in the yards, ideally, horses should be segregated into the following groups:
  - Females with suckling foals;
  - Pregnant females;
  - Other females and juveniles; and
  - Males. If males are observed to be fighting or they are of significantly different age or weight they should be drafted into separate yards.
- Horses should not be held in the holding yards for extended periods. If horses are being held for any length of time they should be drafted into a large holding paddock that contains adequate shade, shelter, food and water.

### Shooting of horses

- It may be necessary to humanely destroy horses by shooting in the following situations:
  - When there is no market for the captured horses;
  - If horses have sustained serious injury during mustering or in the holding yards;
  - Dependant young that are separated from their mother;
  - Previous disease or condition that would prevent the animal from being transported, slaughtered or domesticated.
- Shooting must be conducted 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 confined horses, 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 horse is moving its head. Be patient and wait until the horse 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. This can be achieved by one of the following methods (*see diagrams in Appendix*):

#### Head Shots

##### *Frontal position (front view)*

The firearm should be directed at the point of intersection of diagonal lines taken from the base of each ear to the opposite eye. The bullet should be directed horizontally.

##### *Temporal position (side view)*

The horse is shot from the side so that the bullet enters the skull midway between the eye and the base of the ear. The bullet should be directed horizontally.

- 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.
- 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 which describe disposal methods e.g. Burton, 1999; AUSVETPLAN Operational Procedures Manual: Disposal (1996); NSW EPA (2001) Guidelines for disposal of dead stock.

## Further Information

Contact the relevant Commonwealth, State or Territory government agency from the following list of websites:

Commonwealth	Department of Environment and Heritage <a href="http://www.deh.gov.au/">http://www.deh.gov.au/</a>
ACT	Environment ACT <a href="http://www.environment.act.gov.au/">http://www.environment.act.gov.au/</a>
NSW	NSW Department of Primary Industries <a href="http://www.dpi.nsw.gov.au">www.dpi.nsw.gov.au</a>
NT	Parks & Wildlife Commission <a href="http://www.nt.gov.au/ipe/pwcnt/">www.nt.gov.au/ipe/pwcnt/</a>
QLD	Department of Natural Resources and Mines <a href="http://www.nrm.qld.gov.au">www.nrm.qld.gov.au</a>
SA	Animal & Plant Control Commission <a href="http://sustainableresources.pir.sa.gov.au">http://sustainableresources.pir.sa.gov.au</a>
TAS	Department of Primary Industries, Water & Environment <a href="http://www.dpiwe.tas.gov.au">www.dpiwe.tas.gov.au</a>
VIC	Department of Primary Industries, Agriculture & Food <a href="http://www.dpi.vic.gov.au">www.dpi.vic.gov.au</a>
WA	Agriculture WA <a href="http://www.agric.wa.gov.au">www.agric.wa.gov.au</a>

## References

- Agriculture and Resource Management Council of Australia and New Zealand (1996). AUSVETPLAN (Australian Veterinary Emergency Plan). Operational Procedures Manual: Disposal. Edition 2 version 2.0. Document available electronically from the Animal Health Australia website: <http://www.aahc.com.au/ausvetplan/disfnl2.pdf>
- American Veterinary Medical Association (2001). 2000 Report of the AVMA Panel on Euthanasia. *Journal of the American Veterinary Medical Association* **218**, 669–696.
- Bureau of Land Management. (undated). Standard Operating Procedures: Methods for the humane capture of wild horses or burros. U. S. Department of the Interior. Document available electronically from the Bureau of Land Management website: [http://www.or.blm.gov/Burns/Planning/planning\\_docs/Comment\\_Period/S\\_Steens\\_Gather\\_Appendix\\_D.pdf](http://www.or.blm.gov/Burns/Planning/planning_docs/Comment_Period/S_Steens_Gather_Appendix_D.pdf)
- Burton, R. (1999). Humane destruction and disposal of stock. Agnote DAI-136. NSW Agriculture, Orange. Document available electronically from the NSW Agriculture website: <http://www.agric.nsw.gov.au/reader/aw-companion/dai136.htm>
- Dobbie, W. (1992). *Control of brumbies in central Australia*. Conservation Committee of the Northern Territory and the Northern Territory Department of Primary Industries and Fisheries, Alice Springs.
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- English, A. W. (2001) A report on the management of feral horses in National Parks in New South Wales. Document available electronically from the NSW National Parkes & Wildlife Services website: <http://www.nationalparks.nsw.gov.au/npws.nsf/Content/English+Reports+on+feral+horse+management+in+national+parks+and+reserves>
- NSW Environment Protection Authority (EPA) (2001). Procedure for dead stock disposal. Document available electronically from the NSW EPA website: <http://www.epa.nsw.gov.au/mao/deadstockdisposal.htm>.
- NSW National Parks & Wildlife Service (2003). Draft Guy Fawkes River National Park Horse Management Plan, NSW National Parkes & Wildlife Services, Hurstville.
- Primary Industries Ministerial Council (draft). Model Code of Practice for the Welfare of Animals: Killing or Capture, Handling and Marketing of Feral Livestock Animals. CSIRO, Australia.
- Ramsay, B. J (1994). *Commercial use of wild animals in Australia*. Australian Government Publishing Service, Canberra.
- SCARM (1997). Model Code of Practice for the Welfare of Animals: Land Transport of Horses. Report No. 62. Standing Committee on Agriculture and Resource Management, CSIRO.
- Senate Select Committee on Animal Welfare (SSCAW) (1991). *Culling of large feral animals in the Northern Territory*. Senate Printing Unit, Parliament House, Canberra
- Standing Committee on Agriculture, Animal Health Committee. (1991). Model Code of Practice for the Welfare of Animals: Feral Livestock animals – Destruction or Capture, Handling and Marketing. CSIRO, Australia.

# Appendix

## Recommended shot placements - Feral horse

Diagram 1

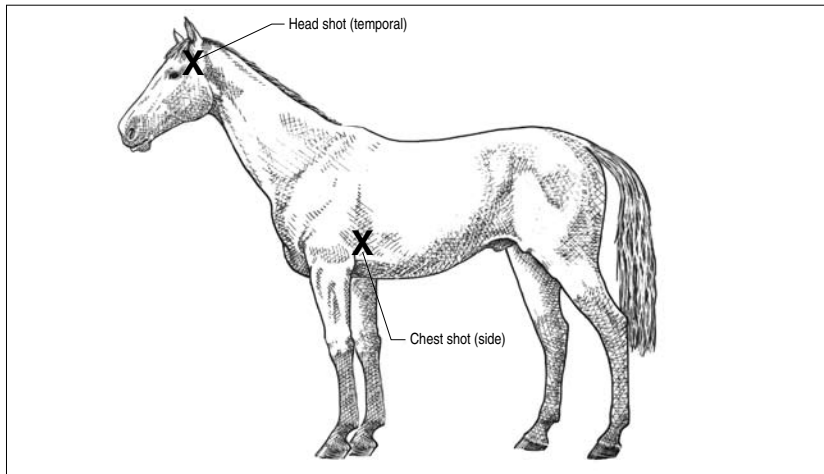


Diagram 2 - Side view (skeleton)

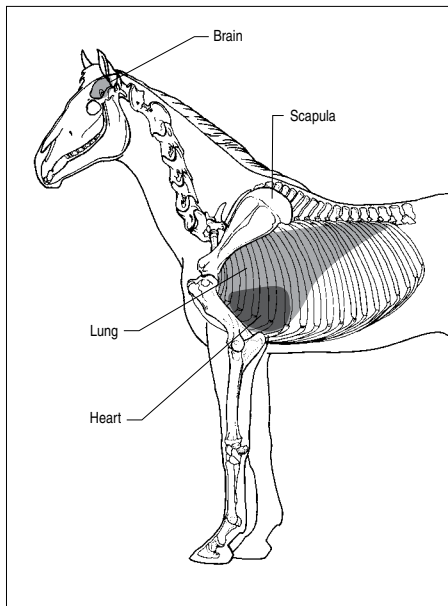
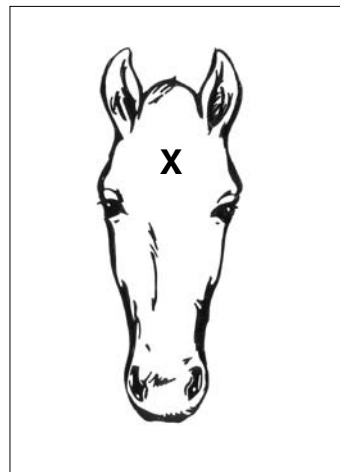


Diagram 3 - Head shot (frontal)



**Note:** Head shots (temporal or frontal) should be used for shooting feral horses at short range (< 5 metres). See text for details.



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