



NSW NATIONAL PARKS & WILDLIFE SERVICE

NPWS H009 Aerial shooting

Wild horse control standard operating procedure

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Related documents

NPWS wild horse control standard operating procedures:

- NPWS H001 Ground shooting
- NPWS H002 Passive trapping
- NPWS H003 Removal for domestication (rehomeing)
- NPWS H004 Removal for knackery or abattoir
- NPWS H005 Killing in yards (in preparation as of November 2023)
- NPWS H006 Mustering (in preparation as of November 2023)
- NPWS H007 Euthanasia (in preparation as of November 2023)
- NPWS H008 Problem wild horses (in preparation as of November 2023)

Sharp T, 2011. *Aerial shooting of feral horses. Standard Operating Procedure*. PestSmart. Centre for Invasive Species Solutions, Canberra, Australia. Available at: <https://pestsmart.org.au/toolkit-resource/aerial-shooting-of-feral-horses>

NPWS Aviation Safety Policy

NPWS Aerial Shooting (Feral Animal Aerial Shooting Team (FAAST)) Aviation Standard Operating Procedure

NPWS Firearms Management Manual

The FAAST Manual: Feral Animal Aerial Shooting Team

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Background

Wild horses in national parks negatively impact the natural environment, cultural and historic heritage, and public safety. The National Parks and Wildlife Service (NPWS) is committed to managing the negative impacts of wild horses in New South Wales (NSW) national parks through implementation of a management control program which is consistent with relevant Commonwealth and/or NSW animal welfare legislation, regulations, codes of practice and standard operating procedures.

This Standard Operating Procedure (SOP) meets the requirements of the Kosciuszko National Park Wild Horse Heritage Management Plan in relation to aerial shooting of wild horses.

This Standard Operating Procedure (SOP) is specific to NPWS operating in Kosciuszko National Park and does not replace or override any NSW or Commonwealth legislation. The SOP has been developed following consultation with the RSPCA NSW and relevant specialists, and completion of a documented field assessment preliminary program. The SOP will be reviewed annually or more often as required.

Application

Aerial shooting of wild horses is particularly useful in large, remote and/or inaccessible areas where the use of other control methods is not effective and/or practicable (Dobbie et al. 1993; Edwards et al. 2004).

The animal welfare outcomes of aerial shooting are improved when carried out by trained, experienced and skilled shooters, multiple shots are taken, and appropriate firearms, ammunition and shot placement are used (Hampton et al. 2017).

There are several key considerations that will guide the application of aerial shooting by NPWS:

- Aerial shooting should be used in a strategic manner as part of a program designed to achieve sustained effective population control.
- Aerial shooting of wild horses will only be performed by approved NPWS *Feral Animal Aerial Shooting Team (FAAST)* accredited firearms users who have the necessary experience, licences and accreditation. Shooter skill has been shown in multiple studies to be the most important parameter affecting animal welfare (Hampton et al. 2014, 2017).
- The safe and effective management and use of firearms must comply with the *NPWS Firearms Management Manual*.

Animal welfare considerations

Impact on target animals

NPWS will use trained, experienced and skilled shooters, and appropriate firearms and ammunition, in a manner that results in the most rapid death possible for shot horses.

NPWS will also ensure:

- That shooters only target the chest (heart/lung) or head (brain).
- That shooters will not take a primary shot at an animal unless the anatomical target zones listed above are clearly visible.
- That, where practical, all horses in a social group will be killed before targeting other social groups.

- Since it is difficult to assess with certainty from the air whether an animal is dead, it is essential that a deliberate policy of 'insurance shots' (also known as 'repeat shooting' or 'over-kill') be followed, where a minimum of two shots are used per animal. That is, after an initial chest or head shot, at least one other shot must be fired into the chest to ensure death.
- A 'fly-back' procedure must be followed, in which the shooter is flown back over the shot animal to visually ensure death and apply follow-up shots to the chest if deemed necessary (Hampton et al. 2022).
- That, in the event of a wounded horse, it must be located and killed as quickly as possible before targeting additional animals.
- Thermal detection equipment (Cox et al. 2023) must be available to permit quick detection and follow-up of non-fatally wounded horses if required.
- if a ground observation is undertaken - if a lactating female horse has been killed but no foal is present, all reasonable efforts will be made to find any dependent young and kill them as quickly as possible.

Impact on non-target animals

Shooting will only occur once a wild horse has been positively identified.

- Shooting is target-specific, i.e. a targeted wild horse will be positively identified before a shot is taken, thus avoiding direct harm to non-target animals.
- Non-target impacts of shooting may include noise disturbance.
- The use of lead (Pb)-free projectiles approved for use in this SOP avoids impacts of toxic lead residues in carcasses to wildlife scavengers. The potential impact of lead projectiles also approved for use in this SOP on wildlife scavengers is acknowledged.

Health and safety considerations

- A first aid kit must be available.
- Care must be taken when handling wild horse carcasses as they can transmit zoonoses such as Q-fever and Hendra virus. Appropriate personal protective equipment, e.g. gloves, must be worn to protect skin. Routinely wash hands and other skin surfaces after handling carcasses, and before eating, drinking and smoking. Horse carcasses are heavy, so care must be taken when lifting or dragging them.
- Visitor and staff safety is a priority consideration when undertaking aerial shooting operations. All participants in the program must review the Operational Shoot Plan and Job Safety Analysis (JSA). Notifications and park closures will be undertaken in accordance with NPWS aerial shooting requirements.
- Storage, use and transportation of firearms and ammunition must comply with relevant legislative requirements and the *NPWS Firearms Management Manual* and the *NSW FAAST Manual*.
- Aviation operations must comply with relevant legislative requirements, the *NPWS Aviation Safety Policy* and the *NPWS Aerial Shooting (FAAST) Aviation Standard Operating Procedure*.
- If on-ground post-mortem observations are being conducted, shot animals must always be approached from the dorsal (or spinal) side.

Equipment that may be used

Firearms and ammunition

- Firearms:
 - FN SCAR[®]-H semi-automatic rifle.
 - Aimpoint[®] red dot scope with zero magnification.
- Ammunition:
 - .308 Winchester[®]: 150 grain minimum (see approved ammunition table).
- Silencer/suppressor: B&T AG[®] (formally Brügger & Thomet AG[®]) FN Scar 7.62 Sound Suppressor Rotex V.
- FLIR ThermoSight[®] T75 clip-on thermal scope.
- Thermal scope/monocular: minimum 640×480 sensor.
- Monoculars and binoculars.

Two functioning firearms of the specified make and model must be on-hand at all times in the aircraft.

The accuracy and precision of firearms should be tested before any shooting operation.

Aircraft

- Refer to the NPWS Aerial Shooting (FAAST) Aviation Standard Operating Procedure for aircraft requirements.
- Operations may involve the simultaneous use of multiple aircraft. Standard aviation practices will be followed to ensure suitable spatial separation between simultaneously flying aircraft.

Procedures

Administration

- Relevant documentation as per NPWS policy requirements must be developed for aerial shooting operations. This may include:
 - Shooting operations plan.
 - Notification risk assessment.
 - Officer in Charge and Principle Officer in charge checklist.
 - Aerial shooting (FAAST) officer in charge checklists.
 - Checklist for approval to conduct aerial shooting.
 - JSA and job safety brief.
 - Review of environmental factors.
- The outcomes of operations must be recorded daily, including the number of animals killed, their locations and a log of the track flown.

Personnel

- Each team must comprise three members as a minimum (there must be a pilot in command, a primary shooter and an air observer/navigator).
 - A qualified independent observer (e.g. veterinarian, thermal operator) may also be included in the team as required.
- Refer to the *NPWS Aerial Shooting (FAAST) Aviation Standard Operating Procedure* for aircraft operator, aerial observer/navigator and pilot-in-command requirements.

Approved cartridges/calibres and ammunition

Projectile energy is an important determinant of welfare outcomes in wildlife shooting programs (Hampton et al. 2016). The maximum shooting distance of approved ammunition for wild horses is the distance at which at least 2,711 Joules (J) of kinetic energy is delivered, which equivalent to 2,000 foot pounds.

Before ammunition can be used, ballistic testing using tissue simulant gel blocks must be undertaken to quantify shot precision, estimate terminal kinetic energy levels, and characterise bullet penetration and deformation (Hampton et al. 2021). Outcomes of the testing must be approved by an independent veterinarian prior to use on live animals.

.308 Winchester® ammunition: Sako 150-grain Powerhead Blade® (lead-free)

	Muzzle	50 m	100 m	150 m
Velocity (m/s)	840	804	769	734
Energy (J)	3,442	3,134	2,865	2,613

.308 Winchester® ammunition: Winchester 150-grain PowerMax® bonded protected hollow-point (lead-based)

	Muzzle	50 m	100 m	150 m
Velocity (m/s)	860	817	775	734
Energy (J)	3,587	3,238	2,915	2,618

Above ammunition is manufactured and factory-loaded by Sako® and Winchester®, respectively.

Data above is from the manufacturers via their websites.

Both ammunition types above are approved for use.

Shooting sequence

- Chase time is an important contributor to duration of stress during aerial shooting (Bradshaw et al. 2023). Chase time should be kept to a minimum to the extent reasonably practicable, noting the other requirements of this SOP (e.g. that all horses in a social group should be shot, where practical).
- Once a wild horse (or group) is sighted and has been positively identified, the pilot should position the helicopter as close as is safe to the target animal in order to ensure an accurate shot.
- The pilot should aim to provide a shooting platform that is as stable as possible.

- A horse should only be shot at when:
 - The target anatomical zone can be clearly seen.
 - It is within the effective range of the firearm and ammunition being used.
 - It is likely that the horse can be rapidly rendered insensible, with subsequent death without the animal regaining consciousness. If in doubt, do not shoot.
- All animals must receive multiple shots to the target areas to minimise time to insensibility and the risk of non-fatal wounding (Hampton et al. 2022).
- Shooters may target the chest (heart/lung) or head (brain) only. Initial shots targeting the chest are preferred, since it is a much larger target, and can be more reliably hit when shooting at a moving animal from a moving shooting platform. Chest shooting also causes a maximal degree of haemorrhage (Stokke et al. 2018) and is hence less likely to result in non-fatal wounding, with most cases of non-fatal wounding in past studies attributed to animals being struck in the neck during attempted head shooting (Hampton et al. 2017). However, the judgement of the shooter is paramount in determining the optimum initial shot placement for each target animal.
 - Immediately after delivering the initial shot, the shooter must deliver a minimum of one additional shot in the specified anatomical target areas.
- In a line of running animals, the animals at the tail end should be shot first and then move forward until all animals in the line have been killed.
- To the extent reasonably possible consistent with other provisions of this SOP, dependant foals should be shot first.
- In the event of a suspected wounded animal, no further animals can be targeted. Every practical effort should be made to locate a suspected wounded animal. The animal must then be killed via additional shots delivered to the specified anatomical target area(s).
- Team members should be aware of the possibility of isolated foals (whether due to maternal abandonment, disturbance or other factors) and keep a look out for any such foals. Any isolated foals should be shot.

Aim points

Horses must be targeted in the chest (heart-lung area) or the head (brain). Refer to the *FAAST Manual* for recommended chest and head aim points.

Carcass management

Carcasses must be managed in accordance with an approved Kosciuszko National Park Wild Horse Carcass Management Plan.

References

- Bradshaw CJ, Doube A, Scanlon A, Page B, Tarran M, Fielder K, Andrews L, Bourne S, Stevens M, Schulz P, and Kloeden T. 2023. Aerial culling invasive alien deer with shotguns improves efficiency and welfare outcomes. *NeoBiota*. 83: 109–129.
- Cox TE, Paine D, O'Dwyer-Hall E, Matthews R, Blumson T, Florance B, Fielder K, Tarran M, Korcz M, Wiebkin A, and Hamnett PW. 2023. Thermal aerial culling for the control of vertebrate pest populations. *Scientific Reports*. 13: 10063.
- Dobbie W, Berman D, and Braysher M. 1993. *Managing Vertebrate Pests: Feral Horses*. Australian Government Publishing Service, Canberra.

Edwards GP, Pople AR, Saalfeld K, and Caley P. 2004. Introduced mammals in Australian rangelands: future threats and the role of monitoring programmes in management strategies. *Austral Ecology*. 29: 40–50.

Greene EA, Heleski CR, Ralston SL, and Stull CL. 2013. Independent Observer Pilot Program: an objective evaluation method for determining humane handling and welfare during wild horse gathers. *Journal of Veterinary Behavior*. 2: e7.

Hampton JO, Adams P, Forsyth DM, Cowled BD, Stuart IG, Hyndman TH, and Collins T. 2016. Improving animal welfare in wildlife shooting: the importance of projectile energy. *Wildlife Society Bulletin*. 40: 678–86.

Hampton JO, Arnemo JM, Barnsley R, Cattet M, Daoust PY, DeNicola AJ, Eccles G, Fletcher D, Hinds LA, Hunt R, and Portas T. 2021. Animal welfare testing for shooting and darting free-ranging wildlife: a review and recommendations. *Wildlife Research*. 48: 577–89.

Hampton JO, Bengsen AJ, Pople A, Brennan M, Leeson M, Forsyth DM. 2022. Animal welfare outcomes of helicopter-based shooting of deer in Australia. *Wildlife Research*. 49: 264–273.

Hampton JO, Cowled BD, Perry AL, Miller CJ, Jones B, Hart Q. 2014. Quantitative analysis of animal-welfare outcomes in helicopter shooting: a case study with feral dromedary camels (*Camelus dromedarius*). *Wildlife Research*. 41: 127–135.

Hampton JO, Edwards G, Cowled BD, Forsyth DM, Hyndman TH, Perry AL, Miller CJ, Adams P and Collins T. 2017. Assessment of animal welfare for helicopter shooting of feral horses. *Wildlife Research*. 44: 97–105.

Stokke S, Arnemo JM, Brainerd S, Söderberg A, Kraabøl M, and Ytrehus B. 2018. Defining animal welfare standards in hunting: body mass determines thresholds for incapacitation time and flight distance. *Scientific Reports*. 8: 13786.