INQUIRY INTO THE PROPOSED AERIAL SHOOTING OF BRUMBIES IN KOSCIUSZKO NATIONAL PARK

Animal Welfare Committee

Answers to Questions on Notice

Hearing: 18 December 2023

No.	Question

1. **Timing of vet inspections** – Transcript page 4

The CHAIR: I've just got one more question and then I'll throw back to you. I wanted to ask about the Government report on the median time between the final shot and when the horse was checked, which was given as three minutes. Could I get the mean and the range of those times? I just find that the median is a very odd statistic to report.

ATTICUS FLEMING: Just to be clear, you're talking about the time between the animal being shot and the vet inspecting the 43 that were inspected on the ground.

The CHAIR: Correct.

ATTICUS FLEMING: I can take that on notice.

The CHAIR: If I could get the mean and the range — as I said, the median is an odd statistic to report. Was there a large outlier to cause that statistic to be reported instead of, say, an average?

ATTICUS FLEMING: I'm confident that that's not the reason why the median is used, but I'll have to take on notice the specifics of your previous question.

The CHAIR: Could you take that on notice? Also, if there was a large outlier, could you report that to me as well?

ATTICUS FLEMING: Of course.

Answer:

The *median* time between the final shot and the vet inspection was 3 minutes and 27 seconds.

The *mean* time between the final shot and the vet inspection was 3 minutes and 47 seconds.

For statistical reasons, the median is considered a more reliable measure of average for what is called non-parametric data. In the case of duration data for killing studies, values tend to be right-skewed, and medians are consistently used in this context.

The data range was: 1 minute and 23 seconds to 9 minutes and 41 seconds.

The horse with the longest duration for this parameter was inspected at a duration that was 1 minute and 40 seconds longer than the next-highest value. This was due to the inability to land the helicopter safely immediately adjacent to where the animal lay, and the resultant time required to walk to the animal from the nearest safe landing site.

2. **Changes to operations** – Transcript pages 5-6

The Hon. ROBERT BORSAK: But you haven't answered my question. I asked why did you need a new SOP.

ATTICUS FLEMING: Because there is a range of differences, if you'll let me go through them. One is thermal imaging is available now and is part of what we use in our operations. That wasn't there 10 years ago.

The Hon. ROBERT BORSAK: Such as?

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ATTICUS FLEMING: The thermal imaging equipment that the guys in the helicopter use—

The Hon. ROBERT BORSAK: But the majority of your shooting is being done in daylight, isn't it?

ATTICUS FLEMING: The majority of it is, but there are times—if we're up early in the morning, for example—where the thermal imaging works very well. That was evident last week, for example, when we were conducting operations. That's one example of a change that's happened in the last 10 years. I would say the move to lead-free bullets is important. There's a range of other scenarios. I'm happy to take it on notice and give you an answer of a few dot points that sets out the differences.

The Hon. ROBERT BORSAK: Yes. We'll take it on notice. It'll make interesting reading on how it differs from what they used in Guy Fawkes and what's been floating around since then.

ATTICUS FLEMING: The difference with Guy Fawkes is we're using different helicopters. We're using different rifles. We've got thermal imaging gear. We use the repeat shooting in a way that's evolved, and the training of our staff is a lot better. So I would say there are very significant differences.

Answer:

The NPWS H009 Aerial shooting: Wild horse control standard operating procedure is consistent with the national Aerial shooting of feral horses standard operating procedure (HOR002) but contains additional measures specific to the conditions in Kosciuszko National Park and which reflect advances since the national SOP was published.

For example, the NPWS SOP includes provisions:

- specifying superior equipment and ammunition
- specifying projectile energy requirements (see response to transcript question 3)
- identifying the use of thermal equipment
- providing for the use of lead-free ammunition
- requiring visitor safety assessments
- recognising chase time should be kept to a minimum, to the extent reasonably practicable noting the other SOP requirements
- outlining requirements regarding data collection
- recognising carcass management requirements.

Changes since the Guy Fawkes operation in 2000 include:

- Rifles used for aerial shooting have been updated to the FNSCAR H. Previously the L1A1 Self-loading Rifle, was used. The FNSCAR H, is significantly more reliable and accurate compared the L1A1 SLRs.

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- Consistent use of more powerful helicopters (Airbus H125 'Squirrel' rather than Jet Rangers) enables the helicopter to hover reliably in all FAAST operational circumstances.
- Ammunition is superior to the ammunition used in the Guy Fawkes operation. Non-bonded soft-point lead-based bullets were used to shoot horses in Guy Fawkes. Ballistics testing published in peer-reviewed literature confirms that these bullets tend to penetrate far less than monolithic copper bullets. NPWS now uses monolithic copper bullets, which result in extensive penetration of horse tissue, with the majority of bullet either producing exit wounds or being palpable underneath the skin on the far side of the animal (see "Animal welfare assessment of feral horse aerial shooting – Kosciuszko National Park 2023" – available at www.environment.nsw.gov.au/research-and-publications/publications-search/animal-welfare-assessment-of-feral-horse-aerial-shooting-kosciuszko-national-park).
- Thermal devices are carried on the aircraft to enable detection of animals.
- Additional training requirements for NPWS FAAST shooters.
- The repeat shooting requirement has been strengthened.

3. **Repeat shooting** – Transcript pages 6-7

The Hon. ROBERT BORSAK: I ask you again: Does the SOP allow for pumping an average of 7½ to 15 shots into a horse? Does the National Parks and Wildlife Service consider this to be an indication of a highly trained and competent shooter?

ATTICUS FLEMING: Yes and yes.

The Hon. ROBERT BORSAK: It is?

ATTICUS FLEMING: Yes.

The Hon. ROBERT BORSAK: So pumping 15 shots into an animal in its chest while it's running is humane?

ATTICUS FLEMING: The standard operating procedure requires repeat shooting. It doesn't require 15. It says at least two, from memory, so it requires repeat shooting—

The Hon. ROBERT BORSAK: So why did you end up shooting some animals—and we don't know how many—15 times?

ATTICUS FLEMING: I will have to take that on notice. The average, or the median I think it was, was 7.5 shots per animal.

The Hon. ROBERT BORSAK: That's right. Would you be—

ATTICUS FLEMING: But can I just say the advice that we have from the experts, including the vets and the RSPCA—and I think this was a recommendation even from the review of the Guy Fawkes incident—is that the repeat-shooting policy will contribute to better welfare outcomes.

Answer:

No. Question

The preliminary program of aerial shooting in Kosciuszko National Park achieved very high animal welfare outcomes including:

a) No adverse welfare events – in particular, no non-fatal wounding of horses

b) Median time to insensibility from shooting was 5 seconds (i.e a median time of 5 seconds occurred between the first shot being fired to the moment the animal became recumbent and ceased moving).

c) Very high level of shooting accuracy – 98% of bullet wounds were in the target area.

The report by the independent vets who observed the preliminary program in Kosciuszko National Park in November 2023 states:

“The extensive use of repeat shooting likely made an important contribution to the observed animal welfare outcomes.”

In the preliminary program, an average of 7.5 bullets per horse were fired to ensure the most rapid possible death. These shots were taken within seconds.

- It is important to note that it did not take an average of 7.5 bullets to achieve insensibility or death. Statements to this effect are wrong. A typical shooting event involved two shots being fired at a mobile animal, after which it became recumbent, and five shots were fired into the lateral thorax of the recumbent animal in quick succession. The five shots fired once the animal was insensible were intended to hasten death (as defined by the moment of heartbeat cessation) and to minimise the risk of non-fatal wounding.
- Recumbency and insensibility was typically achieved with 1–3 bullets (independent veterinarian; pers comm).
- Typically, ~5 additional bullets were then placed into recumbent animals to ensure death (independent veterinarian; pers comm). The purpose of the additional bullets is to provide certainty that the animal is dead as typically a helicopter will not land to verify death from the ground. In some cases, a greater number of shots (up to 10) were fired at an already recumbent and insensible animal in order to absolutely ensure that death ensued. The main reasons observed for larger numbers of bullets being fired in this context included the following. First, an animal coming to rest in sternal or dorsal (rather than lateral) recumbency, making it more difficult for the shooter to visualise the cessation of breathing and more difficult to visualise the preferred anatomical aimpoint for ensuring death: the lateral aspect of the cranial ventral thorax. Second, an animal coming to rest underneath the canopy of a tree or bush, making it more difficult for the shooter to visualise the cessation of breathing and more difficult to visualise the preferred anatomical aimpoint for ensuring death. Third, a strong wind causing the hair on insensible horses to move, giving the superficial impression of intentional movement. In all three cases, shooters usually fire extra shots although they are likely unnecessary. This is done to absolutely minimise the likelihood of a live, recumbent animal being mistaken for one that is dead.

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- Repeat shooting (i.e. shooting each animal more than once) minimises the time to insensibility and the likelihood of non-fatal wounding. Multiple studies have shown that cases of non-fatal wounding in aerial shooting are consistently associated with animals that are shot only once or twice (English 2000; Hampton et al. 2014; Hampton et al. 2017; Hampton et al. 2022).
- Published scientific literature highlights that the likelihood of adverse welfare incidents increases when animals are shot only once or with a lower number of shots per animal (Hampton et al. 2022).

Before aerial shooting of horses in Kosciuszko National Park, NPWS conducted tests in accordance with the recommendations prescribed in peer-reviewed published literature for the testing of ballistics technology to maximise the performance of ammunition in terms of animal welfare outcomes (Hampton et al 2021): This included:

- Range and benchtop testing focusing on accuracy and precision, the delivery of kinetic energy levels and projectile behaviour at realistic shooting distances - i.e., the anticipated shooting distances to be used in the field (Caudell, J.N (2013).
    - The process involves using a chronograph set close to the shooter to measure bullet velocity at the level of the muzzle and hence assess muzzle kinetic energy.
    - Shot grouping patterns are used to assess achievable precision.
    - Projectile behaviour is assessed using tissue simulant gel blocks. Variables estimated using gel blocks include the dimensions of the temporal cavity created by the bullet impact, the distance the bullet travels through the gel block before cavity expansion, the degree of fragmentation and deformation of the bullets, and the penetration depth of the bullet.
    - The results of the testing were reviewed and approved by an independent veterinarian with relevant expertise before progressing to the next stage of testing.
- A small-scale pilot study in the field on 14 horses during ground shooting using predetermined threshold pass/fail levels for the ballistics. Summary statistics from the pilot study were:
    - All horses shot at were killed, and all horses were killed with a single shot, i.e. no shots were missed, no horses were non-fatally wounded and repeat shooting was not used.
    - Mean shooting distance was 83 m, with no shots >100m.
    - All horses were shot accurately in the cranial ventral thorax.
    - Bullet penetration was adequate, with all bullets exiting the animal, or being found mushroomed in the sub-cutaneous space of the thorax on the far side of the animal.
    - This means that 14 horses were killed with a single shot from the ground using the same ballistics as that used in aerial shooting (with the exception that bolt action, rather than semi-automatic rifles were used),

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with no adverse events, and at a shooting distance that significantly exceeds that used for aerial shooting.

- The results of the pilot study were reviewed and approved by an independent veterinarian with relevant expertise before progressing to the next stage.

These ballistic tests and live animal ground shooting assessments clearly establish that the.308 Winchester® 150 gr Sako Powerhead Blade® monolithic copper polymer-tip bullets, used in accordance with the SOP, delivers ballistic performance sufficient to ensure high animal welfare outcomes including rapid insensibility.

- The SOP sets out clear requirements for use of the ammunition, including shooting animals at less than 100 m shooting distance.
- In the preliminary aerial shooting program, typical shots from the helicopter were estimated to be taken at <20 meters distance (although not measured). All shots were taken well within the 100-metre requirement.

The .308 calibre cartridge is routinely used across Australia in aerial shooting of large feral herbivores and is prescribed in the relevant national standard operating procedures for the aerial shooting of feral horses, camels, donkeys, pigs and deer. Evidence of the cartridge in use is available for:

a. Feral horses in the Northern Territory and Western Australia in 2013 and 2015 (Hampton et al 2017 – attachment 7).

b. Feral camels in the Northern Territory, Western Australian and South Australia between 2011 and 2013 (Hampton et al 2014).

c. Feral horses in New South Wales in January 2023.

d. Sambar deer in Victoria between 2020 and 2022 (Ramsey et al 2023).

e. Fallow deer and chital deer in New South Wales, the ACT and Queensland between 2016 and 2020 (Bengsen et al 2023).

f. Feral pigs in New South Wales in 2020 (Hampton et al 2021).

g. Feral pigs and fallow deer in South Australia (Cox et al 2023).

h. Fallow deer in South Australia (Bradshaw et al 2023).

i. Feral donkeys in Western Australia for several decades (Woolnough et al. 2011).

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4. **Veterinary qualifications** – Transcript page 7

The Hon. ROBERT BORSAK: Okay, then I'll ask you this question, Mr Fleming. Did the two independent veterinarian observers of the trial shoot in Kosciuszko National Park have any academic background in ballistics as applied to humane killing of animals and any practical shooting experience of feral animals, including horses?

ATTICUS FLEMING: I'll take that on notice.

The Hon. ROBERT BORSAK: You'll take it on notice? Alright. That one's too hard.

Answer:

The two independent veterinarian observers of the trial shoot in Kosciuszko National Park have considerable expertise in ballistic studies as applied to wildlife management.

They have performed investigations in this field for more than a decade spanning manipulative experiments, observational assessments, and a range of other studies.

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At the end of 2023, they had authored many publications in this field. This included a 2021 study outlining a recommended process for reliable and instructive scientific evaluation of newly developed wildlife shooting methods.

The two independent veterinarian observers have undertaken several field assessments of ballistics in wildlife management, spanning several species and shooting methods.

5. **RSPCA observers** – Transcript page 9

The Hon. WES FANG: In relation to that, then, is the RSPCA invited to fly along on the helicopter and monitor it whilst airborne?

ATTICUS FLEMING: The RSPCA observed from a separate helicopter.

The Hon. WES FANG: How close is that helicopter in formation to the aircraft that's conducting the shoot?

ATTICUS FLEMING: I'd have to take that on notice, but certainly close enough for them to have good visibility of what is happening.

The Hon. WES FANG: Are they flying with doors off?

ATTICUS FLEMING: I'd have to take that on notice. I don't have that.

The Hon. WES FANG: I recall, during estimates, part of the reason why an independent person could not be part of the team on the helicopter was cited as the requirement for training et cetera with doors off.

The Hon. PENNY SHARPE: There's CASA regs about who can be on when and whether you've got particular training.

The Hon. WES FANG: I'm quite aware. That's why I was—

The Hon. PENNY SHARPE: Yes, but my understanding is that's why there's a separate chopper. That actually allows that to occur. But we can get the details. I suspect that they're not going to be flying around with doors off in the observing chopper, but we can get all of that detail.

The Hon. WES FANG: I'd appreciate that.

ATTICUS FLEMING: I'll correct this if I get it wrong. There were two particular requirements with the CASA rules. One was, when you're doing that kind of low-level flying that was involved in the survey effort, you could only have people on the helicopter if they had a specialist role. But, secondly, when you're using the booms, that also limits who can be on the chopper and what you're doing. The third factor with the survey, of course, is that we need that to be a repeatable, standardised approach, and that involves one chopper, not a second chopper flying along beside it.

Answer:

The helicopter with the RSPCA representative on board had its door on and closed. It remained approximately 500 vertical and horizontal feet (150 metres) from the operational helicopter – ie, the helicopter with the shooter on board.

The RSPCA representative also conducted a ground inspection of some carcasses.

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6. **Other observers** – Transcript page 10

The Hon. WES FANG: I'm going to come to the numbers shortly. Obviously, you may not be aware, Mr Fleming, but I have some experience in relation to helicopter operations.

ATTICUS FLEMING: I am aware.

The Hon. WES FANG: Some of what was provided by way of evidence, I have able not been able to reconcile with my knowledge, and so I'm just trying to get some understanding of that. You've said that the RSPCA have an open invitation to observe the culling, and you've said that independent vets have actually monitored the trial of the aerial cull. Is it open to independent observers in general? Would you be prepared to let a member of Parliament or independent staff from another welfare agency view the proceedings, given that you won't allow the recording of the cull?

ATTICUS FLEMING: At the moment, I am focused on ensuring that our operations are consistent with the FAAST guidelines, but I'd be happy to take your request generally around transparency on notice to consider whether there is any additional measure that we could take to provide even greater transparency.

Answer:

NPWS is committed to a very high level of transparency.

The preliminary shooting program was evaluated by an independent veterinarian and the report released publicly. A further independent evaluation will occur during the program and that report will be released publicly.

The RSPCA observed the preliminary program and will perform an audit role in relation to the overall program.

NPWS is not aware of any similar shooting program (government, private or recreational) with this level of transparency.

Accordingly, NPWS does not believe additional measures are required in relation to this program.

7. **Impact of culling on Aboriginal heritage** – Transcript pages 12-13

The Hon. AILEEN MacDONALD: I'll change tack a little bit. I'm interested in what impact the wild horse numbers have on the Aboriginal heritage archaeological sites. Can the impact be remediated or repaired, to your knowledge?

The Hon. PENNY SHARPE: I can do a little bit about it. Obviously a lot of the Aboriginal cultural heritage, from the discussions that I've had with First Nations people who are connected to the park, is landscape based and linked to storylines. Things like the connection with the southern corroboree frog and the moths in the caves, the bogong moths, and all of those things are tied up together. Some of that is being harmed just because the horses basically trample that area. If those animals disappear then that's obviously a very big impact. There are more specific sites, though, and I might hand over to Mr Fleming around that. But there's an individual species level and then there are particular sites that were very important, particularly journey sites for young men and

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	young women — those types of things. But the impact with the horses is where they're destroying and harming waterways and grasslands, is my main understanding of that. **ATTICUS FLEMING:** I don't think there's very much I can add to what the Minister said, other than to note there was some detailed work done with an Aboriginal advisory group in the course of preparing the plan. I'd be happy to take it on notice and provide that. **The Hon. AILEEN MacDONALD:** Thank you, if you could.

Answer:

The park is culturally significant and important to Aboriginal people as part of the broader Aboriginal cultural landscape setting. More than 1,000 Aboriginal heritage archaeological sites protected under the *National Parks and Wildlife Act 1974* are recorded in the park, reflecting the Aboriginal occupation of the area for more than 9,000 years. Intangible Aboriginal cultural heritage also exists. .

Achieving the population target by 30 June 2027 will significantly reduce the density of wild horses in retention management areas and remove them entirely from removal management areas, and so reduce the negative impact on both tangible and intangible Aboriginal cultural heritage values.

Ongoing engagement occurs with the two Aboriginal advisory groups for Kosciuszko National Park during implementation of the Wild Horse Heritage Management Plan. Additionally, there is a statutory requirement to include an Aboriginal representative on the Wild Horse Community Advisory Panel (CAP).

The Aboriginal cultural values report: Investigating Aboriginal people's associations with wild horses in Kosciuszko National Park (2021), NSW is available at https://www.environment.nsw.gov.au/research-and-publications/publications-search/aboriginal-cultural-values-report.

8.	**Tabling of SOPs** – Transcript page 14 **The Hon. WES FANG:** My last question is in relation to the SOP you tabled this morning. It has on the second page after the title page a number of related documents. A number of those documents say "In preparation as of November 2023" and there's a number of other documents listed underneath that. Are you able to table the documents 1 through 8, which are the SOPs that relate to it? It would appear that this document is a draft or relates to other SOPs, including killing in yards, mustering, euthanasia problem, wild horses and some of the other documents — firearms management manual et cetera, aviation safety policy. Could you table those documents listed in the related documents for the Committee to also cross-check, please? **ATTICUS FLEMING:** We'd be happy to table the other approved SOPs. **The Hon. WES FANG:** Thank you very much.

Answer:

No.	Question
	Approved standard operating procedures for other horse removal methods are attached.