Animal Welfare Assessment of Kangaroo Culling: Australian Capital Territory, 2023

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EXECUTIVE SUMMARY

This report described an independent animal welfare assessment of the 2023 Australian Capital Territory kangaroo management program. The report describes field observations performed by an independent veterinarian of 146 kangaroos that were shot at over three nights in June 2023. Important animal welfare parameters were quantified including the frequency of shots missing kangaroos, of animals escaping, and of inaccurate shots. Generally, animal welfare outcomes were comparable to other professional shooting programs. The guiding procedural document, the *National code of practice for the humane shooting of kangaroos and wallabies for non-commercial purposes* (the COP) was complied with in all aspects. A minority (5%) of animals were missed, non-fatally wounded, or not rendered immediately insensible by initial shooting. These outcomes were considered to constitute 'adverse animal welfare events'. In light of the compliance with the COP and relative infrequency of adverse events, it is recommended that currently used shooting protocols should be maintained.

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1.1. Introduction

Populations of kangaroos (*Macropus* and *Osphranter* spp.) reach high densities on conservation estate in many parts of Australia, and are often subjected to ongoing reduction, or 'culling' programs (Pedler *et al.* 2021). Peri-urban populations of eastern grey kangaroos (*M. giganteus*) in the Australian Capital Territory (ACT) have been subjected to ongoing reduction programs for this reason (Gordon *et al.* 2021). Abundance reduction has been largely achieved by non-commercial or 'damage-mitigation' professional shooting (Lucas *et al.* 2021). The eastern grey kangaroo in the ACT is declared a controlled native species under the Nature Conservation Act 2014. The use of ground-based night shooting as a management tool for the reduction of kangaroo population densities in the ACT is described in the Eastern Grey Kangaroo: Controlled Native Species Management Plan (ACT Government 2017).

Under the Controlled Native Species Management Plan, all kangaroo shooting programs are required to be conducted in accordance with the *National code of practice for the humane shooting of kangaroos and wallabies for non-commercial purposes* (hereafter 'the COP') (Commonwealth of Australia 2008). The COP sets a minimum standard of humane conduct for persons undertaking the non-commercial culling of kangaroos.

The 2023 ACT kangaroo management program targeted kangaroos in several peri-urban sites in the ACT. The program was conducted with the intent of strict adherence to the standards outlined in the COP. To facilitate compliance with the COP and to allow transparent demonstration of animal welfare outcomes, an independent animal welfare audit was conducted. A veterinarian, who was independent of the shooting program (i.e. not a member of the shooting team or an employee of the managing agency) collected ante-mortem (before death) and post-mortem (after death) data from a representative sample of shot animals. The independence of the observer from the shooting team and the managing agency was considered important to provide an unbiased assessment of the program to stakeholders and the general public.

1.2. Methods

Methodology for the 2023 independent animal welfare audit was identical to that used to assess the same management program in 2015 (Hampton 2015) and 2017 (Hampton and Cowled 2017). The methodology used was derived from peer-reviewed studies of animal welfare outcomes in terrestrial wildlife shooting programs (Hampton *et al.* 2021), whereby two types of measures are used. Resource-based measures assess whether prescribed inputs are complied with (i.e. if the type of vehicle, firearm or chemical specified in a procedural document are used), and were used to assess protocol compliance. Animal-based measures are physiological and behavioural parameters, and provide direct evidence of what animals experience. They were used to assess animal welfare outcomes (Hampton *et al.* 2016). The independent observer was present for three nights of shooting.

1.2.1. Study area

Shooting events were observed over three nights in June 2023 at three sites in the ACT: 1) Mulanggari Grasslands Nature Reserve (MGNR), 2) The Pinnacle Nature Reserve (PNR), and 3) Red Hill Nature Reserve (RHNR).

1.2.2. Shooting configuration observations

The COP specifies that shooters should only take 'head shots'; to aim to hit adult kangaroos in the brain, and that juvenile 'young-at-foot' animals should be shot so as to be hit in the brain or heart. The COP specifies that a rifle of minimum .204 Ruger® centrefire calibre should be used. The COP specifies that immediately after shooting of adult kangaroos, pouches of shot females should be checked for the presence of live pouch young, and if detected, they should be euthanased with blunt cranial trauma or decapitation (Commonwealth of Australia 2008).

An independent observer assessed shooting teams from two agencies; the ACT Parks and Conservation Service, and a private contractor. Each shooting team consisted of a shooter and a driver. Customised four-wheel drive buggy vehicles (without windscreens) were driven slowly (5−10 km/h), with a shooter and driver sitting in the seats and the observer seated behind or between them. The independent observer recorded the specifications of all equipment used and documented procedures followed by the shooting teams. In total, four shooters were observed during the assessment (**Table 1**).

The shooting procedure was as per the standard approach to kangaroo shooting (Hampton and Forsyth 2016). Briefly, the vehicle was stopped when a stationary kangaroo was sighted and estimated to be within the maximum shooting distance specified by the COP (i.e. <200 metres) (Commonwealth of Australia 2008). Shooting was not to be undertaken from a moving vehicle, nor targeting moving or non-standing animals. Following the COP, the shooter shot at the cranium (brain) as the sole target anatomical zone for adult kangaroos and the brain or thorax as target anatomical zones for sub-adults (young-at-foot).

Infra-red technology (thermal and night-vision) was used to permit shooting without spotlights (Hampton and Forsyth 2016). Rifles were fitted with telescopic scopes as per the COP. All rifles used noise suppressors to minimise disturbance to nearby housing. All firearms used were centrefire bolt-action rifles chambered in .223 Remington®. All shooters used 55 grain polymer-tip hollow-point lead-based ammunition. The observer recorded ante-mortem and post-mortem data for all shooting events during the assessment.

1.2.3. Ante-mortem observations

From each shooting event, the observer recorded the following data: the number of shots fired at each animal, whether shots hit animals, whether shot animals died or escaped wounded, the apparent time to insensibility for shot animals, and whether killed animals were found. As soon as possible after shooting one or more kangaroos, the animals were approached to confirm death, check for the presence of pouch young and assess ballistic

pathology (bullet wound injuries). Animals were searched for after shooting using thermal and night vision devices and limited white light illumination.

When adult female kangaroos were shot, any pouch young present were required to be euthanased immediately, as per the COP (Commonwealth of Australia 2008). Euthanasia procedures were performed with the intent of complying with the conditions specified by the COP. The protocol used by all staff involved furred and unfurred pouch young being euthanased via blunt trauma. For each pouch young euthanased, the observer recorded number of pouch young present, the age class of pouch young (furred or unfurred), and the euthanasia method applied (bunt trauma and/or decapitation).

1.2.4. Post-mortem observations

Adult kangaroos were subjected to post-mortem examination as soon as the vehicle containing the shooter/driver and observer approached their body. The observer recorded the age of each animal (adult or sub-adult), the sex of the animal, and the location and number of bullet wound tracts. Locations of bullet wounds were recorded following the methodology of Hampton *et al.* (2015). The pouches of adult female kangaroos were inspected.

1.3. Results

Observations were made for a total of 146 kangaroos that were shot at over three nights, between the 14th–29th of June 2023. Only one shooting team was assessed on each night of observations. The number of kangaroo shooting events observed, the field site, and shooting team are shown for each night of the assessment in **Table 1**.

Table 1. Logistical data for the collection of animal welfare data from the non-commercial shooting of eastern grey kangaroos (*Macropus giganteus*) in peri-urban conservation estate in the ACT, June 2023. Shooters are designated by numbers rather than by name.

Night of observations	Shooting agency	Shooters observed	Field site	Animals shot at (*n*)
1	Government	1, 2	MGNR	72
2	Contractor	3	PNR	54
3	Contractor	4	RHNR	20
Total				**146**

1.3.1. Shooting configuration

The firearms and ammunition used by the shooters are described in 2.2 (above), and complied with the COP. On all shooting nights observed, the firearm used was confirmed to be zeroed prior to use as per the COP (Commonwealth of Australia 2008).

1.3.2. Ante-mortem data

A total of 146 kangaroos were shot at. The shooting outcomes are shown in **Table 2**. All kangaroos were stationary and standing prior to shooting. A total of 149 shots were fired, with 2 shots observed to miss animals entirely, 3 kangaroos shot twice after not being rendered immediately insensible, and 2 kangaroos being non-fatally wounded by initial shots and escaping (**Table 2**). In both instances of non-fatal wounding, any attempt to shoot other animals was ceased and considerable time and effort was dedicated to locating the wounded animals. Shooting only resumed once all reasonable efforts had been made.

All other shot animals (*n*=139) were rendered immediately insensible from the first shot. Median time to insensibility (the duration from initial shooting to insensibility) for the 3 kangaroos that were killed but not rendered immediately insensible was 45 seconds (range 28−49 seconds). The number of kangaroos shot and killed before shooting teams collected them and performed post-mortem inspections ranged from 1−5 animals. Shooting teams confirmed the sex and species of all shot kangaroos, and inspected the pouches of all shot female kangaroos for pouch young.

Table 2. Summary of ante-mortem data collected from the non-commercial shooting of eastern grey kangaroos (*Macropus giganteus*) in peri-urban conservation estate in the ACT, June 2023.

Category	Sample size (*n*)
Number of animals shot at	146
Number of animals hit	144
Number of animals found	142
Number of animals rendered immediately insensible	139
Number of animals escaping unwounded (missed)	2
Number of animals not rendered immediately insensible and shot multiple times	3
Number of animals escaping wounded	2

1.3.3. Post-mortem examination

Shot animals
Of the 142 kangaroos that were shot and killed, all were found by the shooting teams – hence, 142 animals were available for post-mortem examination. The sex ratio of the shot animals was even (51:49). Sub-adult animals (undeveloped testicles in males and undeveloped mammary glands in females) represented 8% of shot kangaroos (*n*=11) with 92% (*n*=131) of shot kangaroos classified as adults. All but three examined animals (*n*=139) had a single bullet wound tract, while three animals displayed two bullet wound tracts, and all were initially shot in the lower jaw (mandible) or neck. Of the 139 kangaroos rendered immediately insensible, 99% (*n*=137) were shot in the head, while 1% (*n*=2) of these animals were shot in the neck.

Pouch young
A total of 69 adult female kangaroos were inspected for the presence of pouch young. Of these adult female animals, 56 (80%) had one pouch young present, 13 (19%) had no pouch young present, and a single adult female kangaroo (1%) had 2 pouch young present. Of pouch young detected, 67% (*n*=37) were unfurred and 33% (*n*=18) were furred. One semi-independent furred pouch young escaped before it could be euthanased. This occurred when the pouch young associated with a dead adult female could not be captured and was lost from vision due to vegetation and terrain. All other pouch young were euthanased via blunt trauma. The shooting teams were observed to check all euthanased pouch young to confirm death immediately after euthanasia procedures had been performed. No previously undetected pouch young were found by the independent observers and no pouch young were found to be alive after euthanasia procedures had been performed.

1.4. Discussion

1.4.1. Compliance with the Code of Practice

The kangaroo culling operation was observed to be compliant with all aspects of the COP for the non-commercial shooting of kangaroos. The firearms, ammunition and shooting procedures used to target kangaroos met the requirements of the COP. The vast majority of shots fired struck kangaroos, and the vast majority of struck animals were rendered immediately insensible. For the three kangaroos not rendered immediately insensible, repeat shooting was used as a follow-up killing method, as allowed under the COP. For pouch young euthanasia, the use of blunt trauma was compliant with the COP (Commonwealth of Australia 2008).

1.4.2. Animal welfare outcomes

The percentage of kangaroos rendered immediately insensible (95%) was higher than for most published studies of wildlife shooting (Smith and Ryeng 2022), and was similar to that observed for the same management program in 2015 (Hampton 2015) and 2017 (Hampton and Cowled 2017). The non-fatal wounding and escape of animals occurs with nearly all examined shooting methods, including kangaroo shooting, and 1% of kangaroos were observed to be non-fatally wounded in this study. It should be noted that it can be difficult to distinguish minor non-fatal wounding from missed shots in field studies, particularly with night-time shooting methods. The other outstanding event was the escape of a furred, mobile and semi-independent pouch young before it could be euthanased. The pouch young escaped and could not be shot or captured for euthanasia despite significant effort. This rare event highlights the importance of approaching shot adult female kangaroos quietly, and ensuring any pouch young are identified and firmly restrained before shot adult females are moved.

1.5. Conclusions

Independent assessment of this shooting program indicated that animal welfare outcomes were comparable to other professional shooting programs. When kangaroos were shot at, the COP for non-commercial kangaroo shooting was complied with in all aspects. A minority of animals were missed, non-fatally wounded, and shot in anatomical locations other than the cranium.

1.6. Recommendations

From field observations and descriptive analyses, it is recommended that currently used shooting protocols are maintained. To minimise the escape of semi-independent furred pouch young during the rare instances in which they are encountered, caution is recommended when approaching shot adult female kangaroos and inspecting their pouches.

1.7 References

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