Submission No 242

INQUIRY INTO HEALTH AND WELLBEING OF KANGAROOS AND OTHER MACROPODS IN NEW SOUTH WALES

Organisation: Animal Justice Party

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NSW State Secretary,
Animal Justice Party
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Submission: Inquiry into the health and wellbeing of kangaroos and other macropods in New South Wales

This submission has been prepared by the NSW submissions working group within the Animal Justice Party ('the AJP'). The working group makes this submission on behalf of the AJP with the approval and the endorsement of the Board of Directors. The AJP was established to promote and protect the interests and capabilities of animals by providing a dedicated voice for them in Australia's political system, whether they are domestic, farmed or wild. The AJP seeks to restore the balance between humans, animals and nature, acknowledge the interconnectedness and interdependence of all species, and respect the wellbeing of animals and the environment alongside that of humans and human societies. The AJP advocates for all animals and the natural environment through our political and democratic institutions of government. Above all, the AJP seeks to foster consideration, respect, kindness and compassion for all species as core values in the way in which governments design and deliver initiatives and the manner in which they function. The following submission is underpinned by these fundamental beliefs. The AJP has policies on various native animals and environmental issues that are relevant to this inquiry; this submission puts forward commentary in line with these policies.

This submission will respond to the Terms of Reference (TOR) by addressing:

(a) historical and long-term health and wellbeing indicators of kangaroos and other macropods, at the local, bioregional and state levels, including the risk of localised extinction in New South Wales,

(b) the accuracy with which kangaroo, and other macropod, numbers are calculated when determining population size, and the means by which the health and wellbeing of populations is assessed,

(c) threats to kangaroo, and other macropod, habitat, including the impact of:

(i) climate change, drought and diversion and depletion of surface water sources,
(ii) bushfires,
(iii) land clearing for agriculture, mining and urban development,
(iv) the growing prevalence of exclusion fencing which restricts and disrupts the movement of kangaroos

(d) current government policies and programs for kangaroo management, including:

(i) the method used for setting quotas for kangaroo culling,
(ii) the management of licences to cull kangaroos,
(iii) temporary drought relief policies and programs,

(e) current government policies and programs in regards to 'in pouch' and 'at foot joeys' given the high infant mortality rate of joeys and the unrecorded deaths of orphaned young where females are killed,

(f) regulatory and compliance mechanisms to ensure that commercial and non-commercial killing of kangaroos and other macropods is undertaken according to the Biodiversity Conservation Act 2016 and other relevant regulations and codes,

(g) the impact of commercial and non-commercial killing of kangaroos and other macropods, including the difficulty of establishing numbers killed by landholders since the removal of the requirement for drop tags, and

(h) current and alternative measures to provide an incentive for and accelerate public and private conservation of kangaroos and other macropods.

Summary of Recommendations

1. *Immediately end both commercial and non-commercial killing of kangaroos*
2. *Acknowledge kangaroos as a vulnerable species with extended protection under the Biodiversity Act*
3. *Develop and implement policies for rightful and peaceful co-existence of kangaroos and macropods with landholders and farmers, e.g. biodiversity-sensitive agriculture*
4. *Undertake a comprehensive review of current kangaroo count and survey methodologies to closely align with kangaroo biology, reproduction rates and regional environmental factors*
5. *Annual reported numbers should be audited to verify accuracy, and there should complete transparency in this process*
6. *Prohibit the use of barbed wire and exclusion fencing in rural residential areas where it is a hazard to macropods and other animals such as birds and bats.*
7. *Encourage farmers and landholders to seek exclusion fencing alternatives that allow safe passage of kangaroos and wildlife while* also *keeping farmed animals safe*
8. *Ensure adequate kangaroo corridors are created during all relevant development projects.*
9. *Until all commercial and non-commercial killing of kangaroos is phased out, certain interim actions should be in place, including:*
    a. *robust, evidence-based methods should be employed to determine quotas;*
    b. *the regulation of non-commercial licences must be overhauled and include a competency test;*
    c. *shotguns should not be permitted as an accepted firearm to kill a kangaroo; and*
    d. *no kangaroos should be killed in government-sanctioned programs during a drought.*
10. *The NSW government should develop a principle of sentience that is based in scientific research and applied in all policies, laws, regulations, codes and standards that impact animals.*
11. *Use a monitoring, evaluation, reporting and improvement approach to determine the effect of kangaroo shooting on population dynamics, sex ratios and genetic diversity.*
12. *Incorporate new knowledge (*e.g. *deviation from 50:50 sex ratios, reduced genetic diversity) to ensure 50:50 sex ratios and genetic diversity are maintained, and population collapse is prevented.*
13. *Until all commercial and non-commercial killing of kangaroos is phased out, stringent parameters and requirements for competence of shooters should be in place, including:*
    a. *Shooters must have a 0.00 Blood Alcohol Content;*
    b. *The parameters and requirements for shooter competence should be measurable and appropriate;*
    c. *Evaluation and enforcement should be defined in the Code and results should be reported annually; and*
    d. *Shooters should have a demonstrable understanding of the social structure of kangaroo mobs*

14. *Conduct an urgent, transparent and public review into the sustainability of the commercial kangaroo industry*
15. *While our primary recommendation as per TOR (a) is to ban all non-commercial killing of kangaroos, we recommend urgent reintroduction of drop tags and full traceability of any native animals harmed by private landholders while an alternative policy is debated and implemented*
16. *The NSW Government should develop nature-based tourism in NSW, particularly to areas where kangaroos are plentiful; these initiatives should be supported through funding.*

TOR (a) historical and long-term health and wellbeing indicators of kangaroos and other macropods, at the local, bioregional and state levels, including the risk of localised extinction in New South Wales,

Kangaroos are a critical species in the Australian environment. The earliest kangaroos appeared about 25 million years ago and evolved to our modern kangaroos by about three million years ago, through adaptation to the changing climate and environment, especially to the formation of grasslands[1] They were reported to be abundant in various historical records by early colonisers through the 18th century. Since that time, rapid urbanisation, land clearing for animal agriculture[2], droughts, bushfires[3], and human-induced kangaroo population management practices have contributed to their significant decline.

Kangaroo populations have been vastly reduced since European settlement. It is estimated that their current population in NSW is only about 11% of what it was at the time of European settlements in NSW[4]. Since European colonisation, kangaroos and macropods have suffered under an unofficial status of 'pests' through rural landowner communities, governments and public opinion, under the pretext that they compete with cattle and sheep for grass and that they harm crops.

Human conflict with kangaroos and wallabies dates back to the 1880s when all eastern states of Australia, including NSW, introduced legislation for their widespread killing. During the same period NSW's *Pasture and Stock Protection* Act officially declared kangaroos and other macropod species as pests, and from 1883 to 1920, around three million bettongs and potoroos were shot for bounties in NSW[5], with three of their subspecies now extinct. The brush-tailed rock-wallaby, which is now listed as vulnerable[6], was almost exterminated by this bounty program.

This unofficial "pest" status has also transpired to the current day as evident through the "license to harm" programs in NSW, where landowners are permitted to kill kangaroos and wallabies, even though they are protected as native animals under the *Biodiversity Conservation Act (2016)*, and have never officially been declared as pests under any form of state Government legislation. In 2018, additional drought relief measures for farmers in NSW were also introduced, making it easier

[1]Couzens AMC, Prideaux GJ (2018). Rapid Pliocene adaptive radiation of modern kangaroos. Science. 362(6410):72-5. https://science.sciencemag.org/content/362/6410/72

[2] https://www.wilderness.org.au/news-events/10-facts-about-deforestation-in-australia

[3] https://www.wwf.org.au/news/news/2020/3-billion-animals-impacted-by-australia-bushfire-crisis#gs.xxi7gu

[4] Mjadwesch R, 2001, in Kangaroos at Risk: How Many Kangaroos

[5] Short, Jeff. „The Extinction of Rat-Kangaroos (Marsupialia:Potoroidea) in New South Wales, Australia." Biological Conservation 86 (1998): 365

[6] Kangaroos Maligned – 16 Million Years of Evolution and Two Centuries of Persecution." Kangaroos Myths and Realities. Eds. Maryland Wilson and David B. Croft. 3rd ed. Melbourne: The Australian Wildlife Protection Council Incorporated, 2005. Rpt. of Kangaroos – Our Wildlife Heritage – Not an Exploitable Resource. 1992.

to acquire “licenses to harm” and also renew existing licenses over the phone with looser compliance requirements.

Additionally, the prejudicial desire to control kangaroos has also spawned commercial “harvest” industries in many states including NSW, where kangaroos are killed by licensed shooters, and their meat and skin sold and exported for human consumption, pet food and leather. The NSW Government Department of Planning, Industry and Environment also encourages landholders to allow commercial “harvest” of kangaroos from private property as an alternative to license to harm[7].
Throughout Australia, a staggering 31.5 million kangaroos have been killed in the last 10 years for commercial purposes, which is statistically the largest slaughter of any land-based species globally[8]

This large-scale slaughter of macropods has endured under a belief that their numbers are “out of control” and reaching “plague” proportions, and that colonisation created favourable conditions for population “explosions” through elimination of natural predators, increased water points, cropping, and pasture improvement. This is despite consistent research that shows kangaroo populations have not expanded due to the clearing of trees. They can survive on cleared land more successfully than many other native animals, but they prefer habitats with shady trees for rest, and introduced grasses are not their preferred food[9].
Loss of dingoes has reduced predation and probably altered kangaroo populations[10]; however, kangaroo joeys are taken by introduced foxes and this limits kangaroo populations[11]. In the very best conditions and if the joey avoids predation, a female kangaroo may produce one young to independence in 12-18 months[12]; just one, if everything goes right. They most certainly do not "breed like rabbits", and populations cannot "explode" as some wrongly claim; their biology does not support that capacity.

Despite the populist notion that kangaroo populations are exploding, official government figures indicate an alarming decline. According to annual survey data from the Department of Planning, Industry and Environment, NSW’s kangaroo population dropped by nearly 40 per cent just in the last five years. The DPIE found numbers of red and grey kangaroos and wallaroos in New South Wales peaked at 17 million in 2016 and fell to about 10.5 million last year[13].

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[7]https://www.environment.nsw.gov.au/licences-and-permits/wildlife-licences/licences-to-control-or-harm/licences-to-harm-kangaroos

[8] https://voiceless.org.au/kangaroos-pest-or-precious/

[9] Mjadwesch R, 2001, in Kangaroos at Risk: Threats

[10] Morris T, Letnic M. (2017) Removal of an apex predator initiates a trophic cascade that extends from herbivores to vegetation and the soil nutrient pool. Proceedings of the Royal Society B: Biological Sciences. 84(1854):20170111. https://royalsocietypublishing.org/doi/full/10.1098/rspb.2017.0111

[11] Banks, P.B., Newsome, A.E. and Dickman, C.R. (2000) Predation by red foxes limits recruitment in populations of eastern grey kangaroos. Austral Ecology, 25: 283-291. https://onlinelibrary.wiley.com/doi/abs/10.1046/j.1442-9993.2000.01039.x

[12] Tyndale-Biscoe CH (2005). Life of Marsupials. 2nd ed. Melbourne: CSIRO Publishing. ISBN: 0 643 09199 8

[13] https://www.environment.nsw.gov.au/topics/animals-and-plants/wildlife-management/kangaroo-management

Concern for populations, and the threat of decline have in fact existed since 1879 with the emergence of the first *Animal Protection Act* (NSW). Throughout the 1960s and 1970s, population numbers were again a concern with the CSIRO stating '*Red Kangaroos are not nearly so abundant as is generally thought'* and that '*they are subject to great and sudden decline in numbers due both to overshooting and to drought; where both occur together there seems to be a very real chance that the species could be reduced to a level from which it cannot recover.*[14]' . In Victoria, numbers of red kangaroos are so low that they can no longer be shot for the commercial kangaroo trade[15].

Right now, we are again at a crossroads where record numbers of kangaroos are being killed, or they are the victims of drought. We believe the best course of action is to end both the commercial and non-commercial killing and allow their numbers to flourish so that they may exercise their right to exist within their own habitats, free from the interference of humans.

Recommendations:

1. *Immediately end both commercial and non-commercial killing of kangaroos*
2. *Acknowledge kangaroos as a vulnerable species with extended protection under the Biodiversity Act*
3. *Develop and implement policies for rightful and peaceful co-existence of kangaroos and macropods with landholders and farmers, e.g. biodiversity-sensitive agriculture*

TOR (b) the accuracy with which kangaroo, and other macropod, numbers are calculated when determining population size, and the means by which the health and wellbeing of populations is assessed,

In NSW the current approach to setting kangaroo quotas is annual population monitoring, and the setting of harvest quotas is based on a fixed proportion of the estimated population. Population counts are undertaken via an aerial survey measuring the approximate number of kangaroos per square kilometre. These quotas remain fixed until the next annual survey is undertaken.

There are several problems with aerial viewing. One concern is there is nobody to verify the numbers, apart from the person counting them on the plane, and there is considerable room for error or misrepresentation. In the past, there have been questions raised over the validity of the government's reported numbers, where reported population increases have far exceeded what many scientists believe are within the animal's biological capability. Such instances include (KMZ refers to Kangaroo Management Zone):

[14] Frith, Harold, and John Calaby. Kangaroos. Melbourne: Cheshire, 1969
[15] https://andymeddick.com.au/2020/04/20/better-red-than-dead/

- A growth rate of 197% for grey kangaroos in KMZ 1 between 1992 and 1993
- A growth rate of 270% for red kangaroos in KMZ 8 between 1997 and 1998
- A growth rate of 313% for red kangaroos in KMZ 10 between 1992 and 1993

Where a typical growth rate of over 20% would be biologically unlikely, a 50% population growth rate in a population with male:female parity, requires that every female successfully rears its young to independence, and no animals die for 12 months[16].

Also, a population growth for grey kangaroos (for example) seems to indicate that a 9-11% growth rate is reasonable under standard conditions[17]. A 30% increase in one year is given as possible in the wild under exceptionally good seasonal conditions[18]. The only reference to growth rates of 30% (and higher) seem to be "calculated" growth rates, or being referred to population estimates based on aerial survey and application of various "correction factors", rather than observed population growth rates in detailed (small) population studies in the field.

There is also the issue of vested interests from the kangaroo industry and unquestioning media regularly disseminating misinformation about kangaroo populations "exploding", especially during or after drought conditions. This is unlikely to be true, given that during times of drought the fertility naturally drops. Reproduction requires a lot of energy and commitment, and it is not essential for the survival of an individual; so, when an individual is under extreme stress, *e.g.* drought, adverse climatic conditions, lack of food, sudden habitat loss, their reproductive system will temporarily shut down. When kangaroos are under this type of stress, sperm production stops in male kangaroos, and females generally do not conceive unless feed conditions are ideal[19]. A female can even postpone the development of an embryo until an older joey moves out of the pouch - a process called embryonic diapause[20].

This ability to adjust breeding to the environment means that kangaroos reduce their fertility rate, rather than increase their mortality rate. Even in a good season, a female will only produce one joey a year[21]. Several studies[22], including a 20 year longitudinal study at Yean Yan Reserve in

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[16] Staker, Lynda, Macropod Husbandry, Healthcare and Medicinals--Volumes One and Two, Volumes 1-2 https://books.google.com.au/books?id=37e1AwAAQBAJ&pg=PA424&lpg=PA424&dq=A+growth+rate+of+270%25+for+red+kangaroos+in+KMZ+8+between+1997+and+1998&source=bl&ots=zVs3ETipiZ&sig=ACfU3U2CgGYYTgkfUzZp4cMasCcXLe8bYQ&hl=en&sa=X&ved=2ahUKEwij6KTk-_TvAhVy4jgGHQ8ZAB0Q6AEwBXoECAQQAw#v=onepage&q=A%20growth%20rate%20of%20270%25%20for%20red%20kangaroos%20in%20KMZ%208%20between%201997%20and%201998&f=false

[17] Arnold et al 1991 Arnold GW, Grassia A, Steven DE, Weeldenburg JR (1991) Population ecology of western grey kangaroos in a remnant of Wandoo Woodland at Bakers Hill, southern Western Australia Wildlife Research 18(5) 561-575, CSIRO Publishing, Melbourne

[18] Strahan 1995

[19] Tyndale-Biscoe CH (2005). Life of Marsupials. 2nd ed. Melbourne: CSIRO Publishing. ISBN: 0 643 09199 8

[20] Tyndale-Biscoe CH (2005). Life of Marsupials. 2nd ed. Melbourne: CSIRO Publishing. ISBN: 0 643 09199 8

[21] Dawson, T, 2012, *Kangaroos* (2nd Edition), in *Australian Natural History Series (CSIRO)*

[22] Arnold, GW, Grassia A, Steven DE & Weeldenburg JR 1991 Population ecology of western grey kangaroos in a remnant of wandoo woodland at Bakers Hill in southern Western Australia, in Wildlife Research 18 (5): 561-575

Victoria, showed that kangaroo populations will stabilise over time, in equilibrium with their environment, when human interventions cease.

Another problem with the quota method is that it does not take into account changes in conditions over the year or "harvest" period. Over these periods, there could be variations in ecological or cultural conditions, for example, drought, bushfire or flooding, which alter populations significantly. Additionally, the quota method does not take into account the effect that local variations in management have on populations, and there is little capacity to be flexible around making changes to management when necessary.

Given that kangaroos only produce one independent young per 12-18 months[23], and there is a large margin for error or opportunity for deliberate misrepresentation of population numbers, we believe the population size estimates to be inflated. This, of course, benefits the commercial industry and farmers, who both benefit when populations are overestimated in this way.

Recommendations:

4. *Undertake a comprehensive review of current kangaroo count and survey methodologies to closely align with kangaroo biology, reproduction rates and regional environmental factors*
5. *Annual reported numbers should be audited to verify accuracy and there should be complete transparency in this process*

TOR (c) threats to kangaroo and other macropod habitat, including the impact of:

(i) climate change, drought and diversion and depletion of surface water sources,
(ii) bushfires,
(iii) land clearing for agriculture, mining and urban development,
(iv) the growing prevalence of exclusion fencing which restricts and disrupts the movement of kangaroos,

The world's biodiversity is under intense stress and pressure, causing a loss of biodiversity that has led to a global Biodiversity Emergency,[24]; this is an existential crisis for all life on Earth. Human population expansion and human activities are creating the stress and pressure that has forced nature out of balance; major human activities include animal and plant agriculture, logging, fossil fuels (mining & use), mineral mining, the built environment, and killing animals for food, fun or recreation (fishing, shooting, hunting, trapping). Human population and activity is driving biodiversity loss and ecosystem decline through five scientifically and globally recognised drivers:

[23] Tyndale-Biscoe CH (2005). Life of Marsupials. 2nd ed. Melbourne: CSIRO Publishing. ISBN: 0 643 09199 8

[24] Waldon A et al. (2017) Reductions in global biodiversity loss predicted from conservation spending. Nature 551: 364–367. https://doi.org/10.1038/nature24295; and IPBES (2019) Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, et al. (eds.). IPBES secretariat, Bonn, Germany. 56 pages. ttps://ipbes.net/sites/default/files/2020-

exploitation (use, abuse and disregard), habitat loss, pollution, introduced (non-native) species and climate change[25]. Some of the parts of the ToR address the drivers of biodiversity loss and ecosystem decline.

TOR (c)(i) climate change, drought and diversion and depletion of surface water sources

Human activity that generates green-house gases (GHGs) has contributed to the Greenhouse Effect, resulting in global warming and climate damage (human-generated climate change)[26]. This has pushed us to a Climate Emergency; climate damage is a major driver of biodiversity loss. This is now evident in the kangaroo populations across NSW, which according to the most recent research, have dropped by more than 25% since 2019. The annual survey in 2019 estimated that there were 10.5 million kangaroos in the wild in 2020, compared to 14 million in 2019 which equates to a drop of 45% in many areas of western NSW.

Much of this has been attributed to widespread drought[27], as species struggle to find food, and are moving closer and closer to farmland. As climate change looks set to worsen in coming years, the impact on kangaroos is also predicted to worsen. Research from the 1982-1983 drought in NSW reported that 44% of kangaroos died[28]. Drought and subsequent lack of food has different effects on species (30% of red kangaroos and 67% of western grey kangaroos died) and on different ages of kangaroos (see Figure 1). Varied responses of different kangaroo species should be acknowledged and respected in government policy.

Clearly, kangaroo numbers are drastically impacted by drought and climate change, and the NSW government must recognise and respond to this by ceasing all commercial shooting programs.

[25] IPBES (2020) Models of drivers of biodiversity and ecosystem change. https://ipbes.net/models-driversbiodiversity-ecosystem-change

[26] Ripple WJ, et al (2020) World Scientists' Warning of a Climate Emergency. BioScience 70 (1): 8–12. https://academic.oup.com/bioscience/article/70/1/8/5610806

[27] https://www.abc.net.au/news/2021-02-15/drought-drives-kangaroo-population-decline-in-nsw/13144680

[28] Robertson, G (1986) Australian Wildlife Research 13: 349-354 https://www-publish-csiro-au.eu1.proxy.openathens.net/WR/pdf/WR9860349

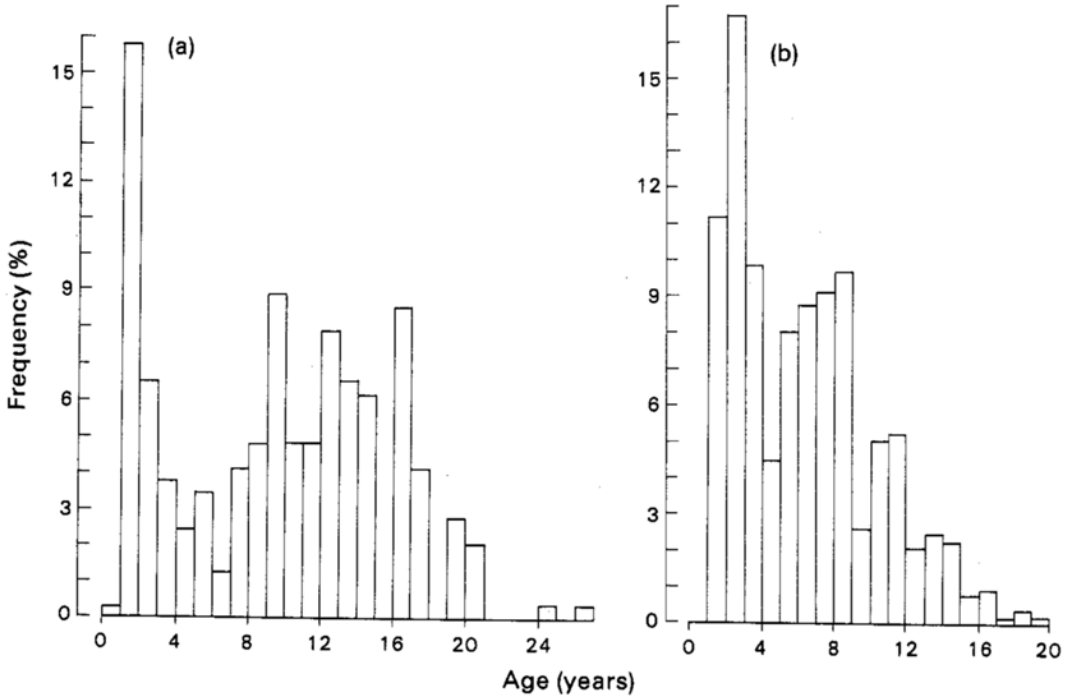

Figure 1: *Proportion of (a) red kangaroos and (b) western grey kangaroos of different ages that died at Kinchega National Park, NSW during the 1982-1983 drought*[28]*.*

As mentioned in TOR (b), droughts have a direct correlation to kangaroos' propensity to breed with breeding reducing significantly during periods of drought.

Freshwater habitats, such as rivers, streams, and wetlands are damaged or destroyed when water is diverted away to facilitate animal and plant agriculture. In 2018-2019, over 350 million hectares in Australia was used for agriculture (332 million hectares were used for grazing, 31 million hectares for crops)[29].

TOR (c)(ii) bushfires

According to research carried out by WWF Australia, it has been estimated that approximately five million kangaroos and wallabies were killed during the Black Summer bushfires during 2019-2020, due to direct and indirect causes[30].

Direct causes of death were:

[29] https://www.abs.gov.au/statistics/industry/agriculture/agricultural-commodities-australia/latest-release
[30] /WWF_Impacts-of-the-unprecedented-2019-2020-bushfires-on-Australian-animals.pdf

- Inability to flee or shelter from fire
- Varying fire intensity
- Lack of suitable habitat, including unburnt refuges
- Smoke inhalation
- Heat stress and associated injuries from heat trauma, injury and dehydration

Indirect causes of death were:

- Runoff of sediment into waterways
- Decreased availability of, and competition for, resources, and
- Predation

The 2019-2020 bushfires also contributed to the decline of the species as a whole, as ecosystems that supported the species have come under more serious threat.

Bushfires will continue to be a threat to the species and their ecosystems, as it has been predicted that in the future, increases in temperature due to climate change will lead to more intense and extended fire seasons[31].

Even with fairly conservative estimates for greenhouse gas emissions, extreme fire risk is predicted to increase by 25% by 2050 and by a further 20% by 2100[32]. This poses a serious threat to kangaroo populations if not managed correctly, as they become more and more exposed to extreme weather conditions including bushfires.

TOR (c)(iii) land clearing for agriculture, mining and urban development

The three main drivers of climate damage are connected to large resource industries: Fossil Fuels and the Mining Industry; Land Clearing & Logging and the Forestry & Timber Industry; and Animal Agriculture and the Farming & Agriculture Industry. Unfortunately, the Australian economy is currently dependent on these industries. The impact of the loss of native vegetation on wildlife in NSW is well-recognised. In 2006, the NSW State of the Environment report concluded that the clearing of native vegetation, with the associated destruction of habitat, is "the greatest single threat to biodiversity in NSW". This is because when an area of native bushland is cleared, the wildlife residing there do not relocate, they simply die, and this affects the biodiversity of that area

[31] (van Oldenborgh, G. J., Krikken, F., Lewis, S., Leach, N. J., Lehner, F., Saunders, K. R., van Weele, M., Haustein, K., Li, S., Wallom, D., Sparrow, S., Arrighi, J., Singh, R. K., van Aalst, M. K., Philip, S. Y., Vautard, R., and Otto, F. E. L.: Attribution of the Australian bushfire risk to anthropogenic climate change, Nat. Hazards Earth Syst. Sci., 21, 941–960, https://doi.org/10.5194/nhess-21-941-2021, 2021.)

[32] Pitman AJ, Narisma GT, McAneney J. 2007. The impact of climate change on the risk of forest and grassland fires in Australia. Climatic Change 84:383-401

forever[33]. The amount of cleared land used for crops is one tenth the amount used for grazing (in 2018-2019, 332 million hectares were used for grazing, 31 million hectares for crops)[34].

According to these calculations more than 104 million native mammals, birds and reptiles have died or will die as a result of the clearing of native vegetation in NSW approved between 1998 and 2005[35].

Additionally, since the relaxation of native vegetation laws in 2017, there was a 60% increase in land clearing rate in NSW with 60,800 hectares of native vegetation cleared in 2018 as compared to 38,000 between 2009 and 2017[36]. It can only be estimated that with this rate of habitat destruction the threats to native wildlife, including kangaroos, will be catastrophic.

It is worth pointing out that much of the land clearing that takes place in NSW is due to the farming of cattle and other ruminant animals. Using the Dry Sheep Equivalent (DSE) measure commonly used by the Department of Agriculture, a cow is likely to have an average DSE of about 12, meaning one cow would be eating the equivalent of what 60 kangaroos would eat[37]. If there is competition for grazing land, it is more likely to be excessive cattle grazing that is the cause.

TOR (c)(iv) the growing prevalence of exclusion fencing which restricts and disrupts the movement of kangaroos

Exclusion fencing was first introduced in the 1860s to halt the spread of rabbits, and since then, has expanded to include the exclusion of kangaroos from farmland as well. It is worth noting that according to a CSIRO report published in February 2020[38], exclusion fencing can have a negative effect on kangaroos through preventing access to familiar sources of food, water and shelter and potentially disrupt social groups and alter natural dispersion. It also stops the natural migratory routes of kangaroos, impacting the ongoing regeneration of the natural environment.

There are also concerns that kangaroos may become entangled in fences causing serious injury and death.

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[33] (NSW Department of Environment and Conservation. 2006. NSW State of the Environment 2006. NSW Dept of Environment and Conservation: Sydney. Section 6.1. [URL:http://www.environment.nsw.gov. au/soe/soe2006/chapter6/chp_6.1.htm#6.1.11] last viewed 10 January 2007. Citing Coutts-Smith, A.J. and Downey, P.O. 2006. The Impact of Weeds on Threatened Biodiversity in NSW, Technical Series no. 11, CRC for Australian Weed Management Systems: Adelaide)

[34] https://www.abs.gov.au/statistics/industry/agriculture/agricultural-commodities-australia/latest-release

[35] C, Johnson, H, Cogger, Dickman, Christopher, H, Ford, 2007/02/01, 1 921031 17 4T1 - 'Impacts of Land clearing: the impacts of the approved clearing of native vegetation on Australian wildlife in New South Wales'

[36] https://www.theguardian.com/environment/2020/jul/02/land-clearing-new-south-wales-rises-60-per-cent-since-laws-relaxed

[37] *Mjadwesch R 2011 Nomination to List the Large Macropods as Threatened Species under the NSW Threatened Species Conservation Act 1995 MESS Bathurst*

[38] https://www.publish.csiro.au/rj/Fulltext/RJ19055

After the 2019-20 bushfire season, there has been growing concern that exclusion fencing can prevent kangaroos from finding suitable shelter from bushfires and other severe weather events.

Some argue that such fencing encourages a 'cluster' effect, whereby enclosing them in one place allows for easier monitoring, and as a result, more sustainable population management, but given the opinion in most farming communities is that the animals are "pests" and are worth more as the targets of commercial "harvest", this is unlikely to be the case.

Recommendations:

6. *Prohibit the use of barbed wire and exclusion fencing in rural residential areas where it is a hazard to macropods and other animals such as birds and bats.*
7. *Encourage farmers and landholders to seek exclusion fencing alternatives that allow safe passage of kangaroos and wildlife while* also *keeping farmed animals safe*
8. *Ensure adequate kangaroo corridors are created during all relevant development projects.*

TOR (d) current government policies and programs for kangaroo management, including:

(i) the method used for setting quotas for kangaroo culling,
(ii) the management of licences to cull kangaroos,
(iii) temporary drought relief policies and programs,

TOR (d)(i) the method used for setting quotas for kangaroo culling

In NSW, as in all states, the current approach to kangaroo quota setting is annual population monitoring, and the setting of kill quotas is based on a fixed proportion of the estimated population. This is undertaken via an aerial survey measuring the number of kangaroos per square kilometre. These quotas remain fixed until the next annual survey is undertaken.

One of the problems with this method is that it does not take into account changes in conditions over the year or kill ("harvest") period. Over these periods, there could be variations in ecological or cultural conditions, for example drought, bushfire or flooding, which alter populations significantly. Another issue is that the current method does not take into account the effect that local variations in management has on populations, and there is little capacity to be flexible around making changes to management when necessary.

Such a reactive and inflexible method of setting quotas could have detrimental effects on populations in different parts of the state where conditions are likely to change, for example, areas experiencing drought.

TOR (d)(ii) the management of licences to cull kangaroos,

Under the *Biodiversity Protection Act,* 2016, a property owner may apply for a licence to kill kangaroos if other non-lethal methods are ineffective and commercial killing cannot be arranged[39].

Also, according to the Act, "*maximum cull limits are set according to property size for the four species subject to commercial harvesting (eastern grey, western grey, red and wallaroo) in each kangaroo management zone.*" This limit is designed to *"authorise harm to the smallest number of animals possible to mitigate the impacts of kangaroos."*

Licences are granted for three months and are subject to monthly reviews. Limits vary by zone and are set out in an annual quota report.

Currently, there is a Commercial Code that sets out regulations for the humane killing of kangaroos, but these regulations only apply to hunters that shoot kangaroos for a commercial purpose. Commercial shooters must pass a competency test before they are permitted to shoot kangaroos[40]. There are no regulations set out that govern how a kangaroo is to be killed under a "culling licence". In fact, the non-commercial code[41] states that 'there is no competency testing regime for non-commercial kangaroo and wallaby shooters nor is there an intention to introduce a regime.' The Non-Commercial Code also permits shooters to use shotguns instead of centerfire rifles.

We believe the current regulations governing the granting of non-commercial licences are weak and do not do enough to protect kangaroos, either from a humane perspective, or from a population perspective.

The fact that there is no standard of competency for shooters engaged in culling allows inexperienced shooters access to killing kangaroos in ways that do not adhere to guidelines set out in the Code, and inexperienced or 'incompetent' shooters are much more likely to cause suffering to an animal through lack of skill. According to the RSPCA, there is a far higher degree of inhumane killing of kangaroos in non-commercial shooting than with commercial shooting. We do not know what the actual level of cruelty is, as the level of policing and enforcement of the Code at the non-commercial level is extremely poor'[42].

[39] https://www.environment.nsw.gov.au/licences-and-permits/wildlife-licences/licences-to-control-or-harm/licences-to-harm-kangaroos

[40] https://kb.rspca.org.au/knowledge-base/what-is-the-difference-between-non-commercial-and-commercial-kangaroo-shooting/

[41] <http://www.environment.gov.au/biodiversity/trade-use/wild-harvest/kangaroo/pubs/code-of-conduct-non-commercial.pdf> accessed 8 October 2010.

[42] https://kb.rspca.org.au/knowledge-base/what-is-the-difference-between-non-commercial-and-commercial-kangaroo-shooting/

We also believe the use of shotguns is inappropriate given that the use of shotguns has been heavily criticised over their inability to consistently achieve humane brain shot outcomes[43].

TOR (d)(iii) temporary drought relief policies and programs

In 2018, the NSW Government made amendments to its policy on non-commercial kangaroo management. These measures were designed to help reduce the impact of drought, and efforts were made to seek volunteer non-commercial shooters to assist in kangaroo shooting. The changes included:

- Physical tags – no longer required.
- More than two shooters may operate under a landholder licence at any time.
- Shooters no longer need to be listed on the landholder's licence at the time of application and only need to be listed on landholder licence returns after culling operations.
- Carcasses may be removed for personal use (but not sold, swapped or traded).

These measures have led to an increase in the number of kangaroos killed under non-commercial permits over recent years in NSW[44]. In addition, changes to the permit system were introduced in August 2018, which have simplified the granting of non-commercial culling permits[45].

We believe these measures will have a negative effect on both the welfare of kangaroos and on the population.

Firstly, simplifying the process for obtaining a non-commercial cull licence means there will be an influx of inexperienced shooters taking part in culling activities. Research has shown that the more inexperienced the shooter is, the bigger the risk to animal welfare, as such shooters often lack the skill to execute a direct shot to the brain, which is the accepted method according to the Act.

Secondly, the easing of regulations around physical tags means

Thirdly, there is a concern that as shooters go about filling kill quotas during periods of drought, there is a danger of over-"harvesting". Natural mortality rates increase significantly during drought periods, so that by the time the kill period begins, populations could have already begun to decline

[43] RSPCA Australia, The Kangaroo Code Compliance Report: A survey of the extent of compliance with the requirements of the Code of Practice for the Humane Shooting of Kangaroos, prepared for Environment Australia, July 2002 <http://www.deh.gov.au/biodiversity/trade-use/publications/kangaroo-report/summary.html#71> accessed 8 October 2010, 6.2.1
[44] ESR 2019; Office of Environment and Heritage 2019https://www.publish.csiro.au/rj/Fulltext/RJ19055#R34
[45] Office of Environment and Heritage 2018a https://www.publish.csiro.au/rj/Fulltext/RJ19055#R70

significantly[46], and this could result in a much greater loss to the population than intended by the kill quota.

It is interesting to note that the NSW Government does not consider drought to be a disincentive to culling, as it states in the Commercial Kangaroo Harvest Management Plan 2017-2021, 'Drought is not considered a threat to the conservation status of kangaroos amidst commercial harvesting with conservative quotas.'

Recommendation:

9. *Until all commercial and non-commercial killing of kangaroos is phased out, certain interim actions should be in place, including:*
    a. *robust, evidence-based methods should be employed to determine quotas;*
    b. *the regulation of non-commercial licences must be overhauled and include a competency test;*
    c. *shotguns should not be permitted as an accepted firearm to kill a kangaroo; and*
    d. *no kangaroos should be killed in government-sanctioned programs during a drought.*

TOR (e) current government policies and programs in regards to 'in pouch' and 'at foot joeys' given the high infant mortality rate of joeys and the unrecorded deaths of orphaned young where females are killed

The Australian National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (2020)[47] and Australian National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Non-Commercial Purposes (2008) require shooters to kill the dependent young (pouch young and young-at-foot) of any females they shoot.

The methods used are decapitation or a blow to the head, and allowing larger young to be killed by shooting. The presence of fur is used as a gauge of "sentience" and the young kangaroo's capacity to feel pain.

Young kangaroos are sentient individuals: The code claims that unfurred young are not sentient or conscious. Anyone who has had even minimal contact with these individuals knows they are all

[46] Pople, A. R. (2008). "Frequency and precision of aerial surveys for kangaroo management." Wildlife Research 35: 340-348

[47] https://www.environment.act.gov.au/parks-conservation/plants-and-animals/urban-wildlife/kangaroos/national-code-of-practice-for-the-humane-shooting-of-kangaroos-and-wallabies

responsive to various stimuli and therefore conscious. A new-born kangaroo responds to gravity and the scent of its mother to travel up the mother's abdominal fur, through the opening of the pouch and then navigate to an appropriately developed teat, to which they attach. This extraordinary feat requires exceptional consciousness, capability and function. Additionally, there is a vast spread of capacity, ability and responsiveness among animals who do not yet have fur. A pouch young is remarkably more developed just before fur is visible compared with the day that they were born, yet both are in the category of unfurred. Individuals who do not yet have fur are definitively not a single group that are all comparable in their faculties.

Killing of Young: There is much room for error in what the shooters are asked to do and, therefore, a great chance of intense cruelty, pain and fear among the young kangaroos. The code should acknowledge that the young kangaroos do not merely feel physical pain; they also feel emotions and are at least fearful, if not terrified. The problem with these methods is that it is not possible to gauge how humane such killing is. Even commercial shooters who are required to undergo training to shoot adult kangaroos, do not complete training on how to humanely kill joeys. At foot joeys are particularly at risk, as most shooters are unable to catch them, and they are subsequently likely to die from starvation, predation or exposure[48]. We believe this poses a risk to the sustainability of populations, as these deaths that occur as a result of starvation, predation or exposure are probably not recorded in the official numbers when tallying how many kangaroos have been shot.

Shooters do not understand the complexity of kangaroo social structure. Pouch young, young-at-foot and adolescent kangaroos are physically, emotionally and socially reliant on their mothers and other individuals in the mob. The adult alpha male has a very specific role that cannot easily or quickly be replaced. Shooting any individual in the mob will be at least disruptive and at worst destructive, leaving other individuals in turmoil. You cannot in any way make this "humane". Shooters could not know who is dependent on whom in a kangaroo mob. So, the National "standard" encourages shooters to shoot everyone who could potentially be dependent on another - that means the entire mob!

Mass killing of kangaroos across Australia is changing the social structure of kangaroo mobs. The large alpha males are the prime target of shooters and they are being eradicated from mobs. The absence of the alpha males allows smaller males to breed; males that naturally would not breed. This is altering the gene pool and the social dynamics in mobs. The sex ratios in some mobs is now heavily skewed toward female. Additionally, the older females are also being shot and removed from the mobs, removing the nurturing, maternal teaching to the younger individuals, which is destructive to the entire social structure of the mob.

[48] https://kb.rspca.org.au/knowledge-base/what-happens-to-joeys-when-female-kangaroos-are-shot/

Recommendations:

10. *The NSW government should develop a principle of sentience that is based in scientific research and applied in all policies, laws, regulations, codes and standards that impact animals.*
11. *Use a monitoring, evaluation, reporting and improvement approach to determine the effect of kangaroo shooting on population dynamics, sex ratios and genetic diversity.*
12. *Incorporate new knowledge (*e.g. *deviation from 50:50 sex ratios, reduced genetic diversity) to ensure 50:50 sex ratios and genetic diversity are maintained, and population collapse is prevented.*

TOR (f) regulatory and compliance mechanisms to ensure that commercial and non-commercial killing of kangaroos and other macropods is undertaken according to the Biodiversity Conservation Act 2016 and other relevant regulations and codes,

The Animal Justice Party is opposed to commercial and non-commercial killing of kangaroos. Until all killing of kangaroos is phased out, there should be stringent parameters and requirements for competence of shooters.

Presently, shooters in NSW must comply with the *Australian National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (2020*)[49] and *Australian National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Non-Commercial Purposes (2008)*. A Code of Practice suggests quality, ethics and morals and therefore best practice or gold standard. However, the national code simply considers a mere minimum standard. There are many questions, such as:

- Why is the Code minimum standard, and not best practice or gold standard?
- How do you expect a competent shooter to make a successful "humane" headshot when they are shooting from a distance, at a small target (the head), that is likely to move, with varied weather conditions and usually at night?
- How is the Code of Practice monitored, evaluated and enforced?
- Why are there so many reports of breaches of the Code of Practice? *e.g.* animals with injuries, such as jaws shot off, when the code requires shooters to have the skill and competence to kill kangaroos with a single shot to the head

[49]https://www.environment.act.gov.au/parks-conservation/plants-and-animals/urban-wildlife/kangaroos/national-code-of-practice-for-the-humane-shooting-of-kangaroos-and-wallabies

- Why is there no mention of blood alcohol content (BAC)? Shooters should be required to have a 0.00 BAC.
- Are shooters expected to know and understand the complex social structure of kangaroos, and demonstrate competency in categorising individuals so as to limit the destruction and disruption to kangaroo mobs?

Recommendation

13. *Until all commercial and non-commercial killing of kangaroos is phased out, stringent parameters and requirements for competence of shooters should be in place, including:*
    a. *Shooters must have a 0.00 Blood Alcohol Content;*
    b. *The parameters and requirements for shooter competence should be measurable and appropriate;*
    c. *Evaluation and enforcement should be defined in the Code and results should be reported annually; and*
    d. *Shooters should have a demonstrable understanding of the social structure of kangaroo mobs*

TOR (g) the impact of commercial and non-commercial killing of kangaroos and other macropods, including the difficulty of establishing numbers killed by landholders since the removal of the requirement for drop tags

Australia's commercial trade in wildlife, and specifically in relation to Kangaroos, is recognised internationally as the most cruel and extensive exploitation of land-based mammals on Earth.

An update to the National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (the Code) was released on Wednesday 18 November 2020. The protections for Kangaroos were further weakened by this update.

The purpose of these codes of practice in relation to Kangaroos in Australia are twofold:

1. To legitimise extreme acts of cruelty which would otherwise be illegal; and

2. To create the impression for consumers, particularly overseas consumers, that Australia's trade in wildlife, in this case members of the Kangaroo family, is humane and is closely managed for compliance; nothing could be further from the truth.

There are also extensive, inherent issues within the so called "sustainability" of the commercial trade in relation to the following matters:

1. Annual commercial quotas simply based on kangaroo population estimates, which in itself raises questions on the accuracy as highlighted in TOR (b)
2. Lack of compliance enforcement and monitoring of licensed shooters with several reports of untrained shooters securing licenses and inhumanely killing or maiming animals in clear violation of the national code of practice[50]
3. Claims that shooters have killed animals that are of sub-adult weight in commercial management zones, possibly highlighting the stark decline of full-sized adults
4. Vested interests within the scientific community with close links to the commercial industry, disseminating biased misinformation to twist public opinion. This is clearly highlighted by several pro-killing "ecologists" featured on Kangaroo Industry Association of Australia (KIAA) website[51]
5. Close links between members of the KIAA with the greyhound industry[52] [53], and industry that is being closely looked at for continued animal welfare irregularities, and which was briefly banned in NSW in 2016
6. Continued bolstering of the commercial industry with taxpayer funding when many overseas markets are closing and other countries have banned[54], or are in the process of introducing bans[55], on kangaroo products, and various companies have stopped selling kangaroo products[56].
7. Safety of the meat for human consumption, with reports of kangaroos carcasses being left unrefrigerated for up to eight hours before being processed; these concerns were also evident in Russia introducing a ban on kangaroo meat twice due to unacceptable levels of the intestinal bacterium, *Escherichia coli*[52].

[50] https://fb.watch/53jpiW9Rqj/

[51] https://www.kangarooindustry.com/en/about-us/supporters/

[52] https://www.racenet.com.au/news/ray-borda-building-an-aston-dynasty-20200122

[53] https://www.heraldsun.com.au/sport/superracing/macro-meats-withdraws-support-of-greyhound-industry-in-wake-of-shocking-live-baiting-scandal/news-story/8d59ee8e81c575e9f6b7c7ba98d2ea66

[54] https://www.abc.net.au/news/rural/2014-08-18/kangaroo-meat-ban/5677656

[55] United States of America, (2021) Kangaroo Protection Act of 2021: A bill to prohibit the sale of kangaroo products, and for other purposes, was introduced to Congress and referred to the House Committee on the Judiciary on 08Feb2021. https://www.congress.gov/bill/117th-congress/house-bill/917/titles?q=%7B%22search%22%3A%5B%22hr+917%22%5D%7D&r=1&s=2

[56] Vercace (https://www.theguardian.com/world/2020/jan/15/versace-bans-kangaroo-skin-after-pressure-from-animal-activists), Belgian supermarkets (https://www.brusselstimes.com/news/world-all-news/90245/supermarkets-join-in-banning-kangaroo-meat-from-shelves-bush-fires-wildlife-hunting-boycott-animal-rights-gaia/), and various other companies listed on the Gaia Campaign webpage (https://www.gaia.be/en/node/1901)

Additionally, as part of a series of measures designed to help farmers control kangaroo populations on their properties during the recent droughts, the NSW Government introduced a measure whereby the requirement for drop tags would be waived.

Drop tags, or commercial tags as they are commonly referred to, are an essential control mechanism which allows a carcass to be traced back to a property, "harvester" or shooter. It also advises how many kangaroos of a particular species are authorised to be "harvested", and the start and expiry date of the tags.

The removal of drop tags represents a clear disparity in protection of native animals where landholders are simply given the right to shoot animals, with limited or no accountability.

Recommendations:

14. *Conduct an urgent, transparent and public review into the sustainability of the commercial kangaroo industry*
15. *While our primary recommendation as per TOR (a) is to ban all non-commercial killing of kangaroos, we recommend urgent reintroduction of drop tags and full traceability of any native animals harmed by private landholders while an alternative policy is debated and implemented*

TOR (h) current and alternative measures to provide an incentive for and accelerate public and private conservation of kangaroos and other macropods.

It is difficult to estimate how much the commercial kangaroo industry is worth in NSW. The Kangaroo Industry Association of Australia estimates its national value at around $200 million, providing approximately 3000 jobs[57]. However, since a recent bill was introduced into the United States Parliament seeking a nation-wide ban on the importation of kangaroo products,[58] the industry is set to potentially lose $80m, which is a significant share of its revenue. This has the potential to render the commercial industry unviable in the near future.

More importantly, the kangaroo is an animal of significant biological and cultural importance, often recognised as an uniquely Australian emblem featured on our coat of arms, national airlines, and used by the eco-tourism sector to attract overseas visitors. Australia has already experienced strong growth in the sector, particularly since 2010, when the industry began to experience

[57] https://www.kangarooindustry.com/en/about-us/
[58] https://www.farmonline.com.au/story/7158406/operation-kangaroo-launched-in-us-to-counter-slaughter-myth/?cs=5706

consistent growth rates of between 4% and 13% year on year[59] and recent figures indicating that the industry now supports 14,000 direct jobs and generates $1.6B in annual revenues[60] almost six times more than the kangaroo commercial killing industry.

According to Ecotourism Australia, the potential of this industry has not been fully realised in Australia, and the sector shows much promise in terms of regional development, employment and conservation outcomes. Working closely with private landholders and farmers, there is great potential for Incorporating our iconic native fauna into new tourism products that can be a major drawcard for attracting overseas visitors and improving Australia's image as a sustainable nation.

Recommendation:

16. *The NSW Government should develop nature-based tourism in NSW, particularly to areas where kangaroos are plentiful; these initiatives should be supported through funding.*

[59] https://www.ecotourism.org.au/assets/Uploads/Manifesto-v5.0.pdf

[60] https://www.ecotourism.org.au/news/media-release-ecotourism-in-australia-delivers-over-14000-direct-jobs-and-1-6-billion-annual-revenue/

Conclusion

The kangaroo is uniquely Australian. It is a symbol often chosen to represent Australia, from our sporting teams to our national airline. It was even chosen to appear on the Australian Coat of Arms because of its ability to stride forward, and its difficulty moving backwards[61].

It seems ironic that this same species is now moving backwards at an alarming rate, enabled by the very governments that chose to enshrine it as a national emblem. Kangaroos are under threat from poor government policy, supported by what many experts consider to be fictitious findings regarding population numbers, and a commercial industry greedy for profits. The numbers are illogical given drought, bushfires and land clearing for cattle.

To some Aboriginal groups, the kangaroo has always been an important totem animal and is believed to help maintain songlines, which are thought to be essential to maintaining the energy balance on which all human life is sustained. Those who did not consider it a totem, relied on it for food in many instances, but were careful to treat the species with respect and only kill enough for subsistence. It is this unique connection that has led some elders, like Uncle Eric Craigie, President of the Australian Alliance for Native Animal Survival, to start advocating on their behalf.

Many Australians do not realise that Australia's commercial kangaroo meat and skin industry is the cause of the biggest land-based commercial wildlife massacre in the world, and many would be outraged to know that the NSW Government allows this to take place despite the fact that kangaroos and other macropods have never been officially listed as pests. The federal government is also complicit in permitting the trade of kangaroo products.

It is our firmly-held position that kangaroos deserve the right to live in their own natural habitats, and to do so with little interference from humans. We believe the commercial and non-commercial killing of kangaroos is driven by greed and fuelled by scientifically-inaccurate information about their population numbers. Ending both the commercial and non-commercial slaughter of macropods would have a positive impact on biodiversity in NSW, and will help reverse the current trend of species extinction, in which Australia is a world leader.

If the NSW Government is serious about reducing grazing pressure and preserving biodiversity in NSW, we believe they should concentrate their efforts on reducing our reliance on animal-based agriculture as a source of food, instead of overseeing the continued slaughter of our remaining wildlife. This could be achieved by encouraging citizens to reduce their meat intake, and helping farmers to transition to plant-based farming, which has far less impact on ecosystems.

Catherine Ward

[61] https://www.pmc.gov.au/government/commonwealth-coat-arms