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STATEMENT

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Improving Kangaroo Management: A Joint Statement

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Summary This Statement on improving kangaroo management originates from the shared experience of many peak bodies and stakeholders that existing policy and practices related to kangaroo management cause perverse outcomes for animal welfare, conservation, productivity, waste, drought resilience, climate, and the health, culture and wellbeing of Australians. The Statement was developed in consultation with delegates from two kangaroo symposia in 2019, and broadened through contributions from other ecological, Aboriginal, animal welfare and conservation stakeholders who believe reform is necessary. Positive change across all these domains requires an empathetic, science-based collaborative and coordinated approach to improve management of kangaroos in Australia, which in turn requires building a broad social mandate for reform. This manuscript presents the drivers and definitions for the Statement and key references documenting the causes and recommended solutions for improving kangaroo management, including many of the papers in this volume. An extensive inventory of conservation, agricultural, animal welfare, indigenous and scientific organisations that have endorsed the Statement is provided. We aim to inform public opinions and drive necessary change to policy, attitude and actions to appropriately value, conserve and utilise kangaroos where there is a tendency for overpopulation. Recommendations include development of a National Kangaroo Strategy that includes discussion on whether overabundant kangaroos are a legitimate sustainable resource that should be managed as such rather than being largely wasted as the by-product of pest control to protect other industries or conservation landuses.

Implications to Managers

- Overabundant kangaroo populations, along with other herbivores, must be managed to conserve minimum forage resources such as grass cover and to enhance conservation, production and animal welfare outcomes.
- Where dingoes are not compatible with other land uses, regulated and accredited harvesting of overabundant macropods (as a resource) is preferable to culling (and wasting) or death by starvation.
- Kangaroo populations are best managed by informed, proactive and adaptive management at property, regional and national scales, so that waste is minimised and resources are used sustainably.

Origins of the Statement and Who We Are

We are eight wildlife scientists with collectively over 200 years of post-doctoral experience in applied ecology, conservation biology, primary production, veterinary science and environmental policy. We have seen the habitats and cohabiting species' populations that overabundant kangaroos degrade, and the drought-induced productivity declines that are accelerated and intensified by overabundant kangaroos. Ecological overabundance refers to population densities that are both higher than historic levels and that cause unsustainable herbivory in altered landscapes. We have witnessed the starvation of scores of kangaroos that have collectively amounted to millions of deaths in the last drought alone. There is an urgent need for kangaroo management reform to prevent these devastating outcomes.

We have four core motivations for preparing this Statement for improving kangaroo management (outlined in Box 1):

- Challenging current kangaroo management that is leading to profoundly detrimental consequences for kangaroo welfare, landscape sustainability, biodiversity conservation, resilient agricultural production and Aboriginal health and culture.
- Providing a credible, collaborative approach to represent diverse stakeholders who have experienced challenges in individually advocating for reform.
- Challenging the viewpoint that commercial harvesting of overabundant macropods is contrary to enhancing their welfare, conservation and cultural status.
- Acknowledging that treating kangaroos as pests in order to meet conservation or production goals limits the cultural, environmental, welfare, conservation and production benefits of managing kangaroos as a resource.

In 2019, two symposia on the management of overabundant macropods (Australian Rangeland Society and Ecological Society of Australia Conferences) revealed consistent views of ecologists and other key government and non-government stakeholders regarding the management of overabundant macropods. This Statement on Improving Kangaroo Management originates from presentations and discussions at these symposia. The meetings were supported by New South Wales (NSW) Western Local Land Services and the NSW Kangaroo Management Task Force. Further discussion followed with agricultural, conservation, Indigenous and animal welfare stakeholders.

Stakeholders (Box 1) agree that kangaroo management represents a divisive 'wicked' problem, with a policy vacuum for reform. Political and corporate fear of upsetting influential interest groups or funders has led to stagnation or decline in kangaroo management. Most managers avoid setting targets for kangaroo numbers, despite informed and improved management being identified as a priority for conservation, animal welfare and productivity outcomes for over half a century (Frith & Calaby, 1969; Read *et al.* 2021).

Policymakers and managers need to do more. While they should not ignore the conflicting values of special interest groups, a science-based approach should be urgently adopted to achieve sustainable land management outcomes that best protect the diverse values of all stakeholders. This Statement will be their foundation; it provides the blueprint for informed kangaroo management, a National Strategy and a way forward.

Endorsement and support

Major agricultural, ecological, wildlife management, conservation advocacy, scientific and Indigenous groups have endorsed the 'Statement' presented in this paper (Box 1). The Royal Society for the Prevention of Cruelty to Animals (RSPCA) Australia also acknowledges that the suffering and death of many kangaroos during drought justifies urgent management of kangaroo populations to protect the welfare of individual animals, to help conserve vulnerable native species and/or to reduce adverse impacts on human activities or the environment. RSPCA Australia supports the development of a national strategy, and ensuring that kangaroo harvesting and culling is conducted to the highest ethical and welfare standards under a single National Code of Practice.

The Statement has thereby gained widespread support from a broad cross-section of the scientific, conservation, animal welfare and agricultural communities. This paves the way for consensus on an informed and unifying new strategy to manage macropods.

How the Statement should be used

The publication of yet another policy reform statement is not sufficient to drive the requisite change needed to avert the chronic damage and episodic welfare catastrophes characteristic of historic macropod management failures. However, we, the authors, and the endorsers of this Statement, feel that our proposed policy framework is different and timely.

States and territories are the custodians of kangaroos in their jurisdictions, and their management plans and regulations are disparate, reflecting State perspectives. However they all have the common failing of struggling to manage irrupting kangaroo populations and not taking into account competing land use priorities. The proposed Strategy would address why and how management might change in regard to these and a number of other important issues outlined in the Statement. It would enable the urgently-needed cross-jurisdictional collaboration.

A recurring theme of the 2019 symposia and subsequent deliberations was the need for collaboration, not only between Commonwealth and States, but also between environment agencies and agriculture departments. While matters that are the responsibility of environment agencies – population conservation and sustainability of harvests – are handled effectively, broad-scale overpopulation is not addressed. Nor is the land-use context in which it occurs. Agriculture agencies could be more active in promoting kangaroos as a sustainable resource by seeking to increase the value of kangaroo products and by improving product processing, branding and animal welfare.

State-level Kangaroo Management plans are prepared for the commercial harvest of kangaroos in NSW, Queensland, South Australia, Western Australia and Victoria to meet their legislative requirements and to satisfy the requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act; see Box 2) and so permit harvesting of kangaroos for a period of 5 years. They describe population trends and the reproductive capacity of kangaroo populations. They meet their primary aim of ensuring commercial harvest does not threaten the species that they cover but they have the failing of being written as though kangaroos were stock to be harvested like fish or forests rather than a population competing for grazing resources. The plans make no mention of the numbers of livestock sharing the grazing nor the numbers of kangaroos culled

Box 1 Improving Kangaroo Management – a Joint Statement

Kangaroos (macropod family, including wallabies) are iconic native animals that are integral to Australian cultures and ecosystem function. In the past 200 years, populations of several species of kangaroos, especially in southern Australia, have increased due to greater availability of pasture, increased watering points, dingo control and less hunting[1].

Failure to manage overabundant kangaroos leads to adverse outcomes for:

- *Animal welfare*: Millions of kangaroos starve to death in drought[2]. Under current kangaroo management, large numbers of kangaroos are also culled by non-professionals leading to increased welfare risks to individuals and dependent young[3].
- *Environment protection and ecosystem conservation*: Despite being native, overabundant kangaroos directly threaten the survival of biodiversity on both private and public lands. They degrade understory, impact rare plants and compete with less conspicuous native animals for resources and habitat[4].
- *Natural Resource Management*: High kangaroo populations compromise regenerative agriculture, pasture conservation, revegetation and stewardship programmes[5].
- *Human health and welfare*: Unmanaged kangaroo populations can have significant financial impacts on landholders in terms of production and landscape management[6]. There are also potential mental health impacts due to witnessing starvation, vehicle incidents and having to euthanise dying kangaroos[7]. Indirect health impacts include increased dust pollution and reduced water quality as a result of erosion through overgrazing and the degradation of groundcover[8].
- *Food waste:* Non-commercial culling results in millions of carcasses being left to rot in the field with implications for Indigenous values[9], food waste[10], invasive predator population maintenance and biosecurity[11].

Avoiding extreme boom-and-bust cycles of macropods is a challenge for wildlife and land managers, agricultural agencies, regulators and industry. Management that has prescribed and measurable objectives would confer significant benefits for kangaroo conservation and welfare; rural communities; human, animal and landscape health; and food security.

Recommendations for managing overabundant kangaroos

- Urgently reform kangaroo management guided by principles designed to improve human and animal welfare, conservation and sustainability on both agricultural and conservation lands, and to reduce food waste.
- Establish Regional Kangaroo Management Groups, with input from land managers, ecologists, Indigenous, welfare, industry, government and conservation stakeholders to develop regional plans for kangaroo management.
- Prepare a National Kangaroo Strategy to support State and Commonwealth governments and other stakeholders in decision-making around kangaroo management.

Terms of Reference for a National Kangaroo Strategy should:

- Reflect and integrate the needs and priorities of all stakeholders, including Indigenous communities and private landholders, and build on existing successful regional initiatives (including those of governments) [12].
- Recognise that setting and maintaining minimal forage thresholds is integral to retaining healthy landscapes, local kangaroo populations and sustainable production, and to ensure kangaroo densities do not cause negative environmental, welfare or economic impacts [13].
- Identify immediate steps to prevent unsustainable post-drought kangaroo population increases through setting clear kangaroo population thresholds.
- Identify objectives, roles and responsibilities of stakeholders and priority knowledge gaps that need to be addressed by targeted research [14].
- Recognise that non-lethal population management tools, such as relocation and sterilisation, are not practical at the scales required and that exclusion fencing alone does not prevent population build-up and has other impacts on biodiversity [15].
- Ensure the highest ethical and humaneness standards and progress towards a system where all harvesting and/or culling of kangaroos is undertaken under a single National Code of Practice [16].

- Consider opportunities to better integrate kangaroo harvesting into rangeland production systems by recognising that kangaroos evolved with Australia's fluctuating climate and could be grazed in a complementary way with domestic stock, producing low carbon emission, healthy meat with low impact on soils and vegetation [17].

Organisations who have endorsed this Statement

ACT Rural Landholders
Arid Recovery
Australian Association of Bush Regenerators
Australian Rangeland Society
Australian Mammal Society
Australian Veterinary Conservation Biology Group
Australasian Wildlife Management Society
Bush Heritage Australia
Conservation Council of South Australia
Friends of Grasslands
Greening Australia
Indigenous Land and Sea Corporation
Nature Conservation Society SA
Nature Foundation Australia SA
NRM Regions Australia Ltd
NSW Farmers
NSW Kangaroo Management Taskforce,
Society for Ecological Restoration Australasia
Sheep Producers Australia
Southern Queensland Landscapes
The Ecological Society of Australia
The Tribal Owners of the Coorong, Lower Lakes, River Murray and the Sea
Walgett Aboriginal Medical Services
Western Landcare NSW IncServices
Wild Deserts Corporation

Key references for topics addressed in the Statement

1 Contemporary increase in macropods (Calaby & Grigg 1989; Frith & Calaby 1969; Wilson 2018; Finch *et al.* 2021; Coulson *et al.* 2021)

2 Starve in drought (Bayliss 1987; Pople *et al.* 2010; Wilson & Edwards 2019; Pedler *et al.* 2021)

3 Culling by amateurs introduces welfare risks (McLeod and Sharp 2014; Wilson & Edwards 2019)

4 Plants and animals threatened by kangaroos (Cheal 1986; Howland *et al.* 2014; Prowse *et al.* 2019; Gordon *et al.* 2021; Morgan 2021; Read *et al.* 2021)

5 High kangaroo numbers compromise regenerative agriculture (Gardiner 1986a; Gardiner 1986b; Norbury *et al.* 1993; Pople & Grigg 1999; Rees *et al.* 2017; Massy 2017; Freeman and Pobke 2021)

6 High kangaroo numbers compromise agricultural profits (McLeod 2004; Atkinson *et al.* 2019)

7 Mental health issues culling and witnessing starvation (KMT 2019; The Land 2018; Zanker 2021; McMurtie & Kerle 2021; Finlayson *et al.* 2021)

8 Erosion and contamination reducing air and water quality (Greene *et al.* 1994; Coulson *et al.* 2000; Viggers & Hearn 2005)

9 Culling affects Indigenous values (Archer 2002; Jackson & Vernes 2010)

10 Culling without harvesting represents food waste (Grigg 2002)

11 Culling represents a threat to biosecurity (Wildlife Health Australia 2018)

12 Build on existing regional programs (McLeod & Hacker 2019)

13 Minimal forage thresholds to trigger management (Portas & Snape 2018; Waters 2018; Gordon *et al.* 2021)

14 Identify key responsibilities and knowledge gaps (Wilson & Edwards, 2021)

15 Nonlethal tools and fencing not sufficient (ACT Parliamentary Counsel 2017; Herbert *et al.* 2021; Wimpenny *et al.* 2021)

16 Harvesting and culling should operate under same National Code of Practice (Natural Resource Management Ministerial Council 2008; Stephens 2021)

17 Benefits of kangaroo for rangeland production (Wilson & Edwards 2008; Wilson & Edwards 2021)

in damage mitigation and that are therefore not part of the commercial industry. Also the plans do not consider the impact of overabundant kangaroos on most other conservation attributes or productivity of agricultural lands.

Improving kangaroo management is an issue of national significance. We believe effective change will only occur with a coordinated fact-based approach that builds a broad social mandate for improved management of kangaroos across Australia. We are asking the Australian Government to lead on rectifying this animal welfare and environmental disaster.

We advocate preparation of a National Kangaroo Strategy through a process of extensive consultation undertaken by a National Task Group and Secretariat. The proposed Strategy would inform an overarching management plan that could potentially be registered under the EPBC ACT reform—setting clear and concise rules that deliver outcomes for the environment and enable development to continue in a sustainable way. Reforms provide a way forward that seeks to build community trust that the national environmental laws deliver effective protections, while regulating businesses efficiently. The Act in its current form achieves neither.

The Strategy would then be implemented under the direction of a Task Group working in partnership with stakeholders.

Discussion

Balancing the conservation, animal welfare and production threats of overabundant kangaroos has strong parallels with management challenges for wild herbivores on other continents. For example, culling of overabundant elephants in National Parks in South Africa provoked so much outcry that a moratorium on culling was imposed in 1994. The subsequent increase in the elephant population led to the rapid destruction of vegetation that endangered other animals (Scholtz 2005). The elephant moratorium demonstrates that the impact of emotive perceptions and runaway media should not prevent proactive science-based management using a range of techniques to meet considered elephant management objectives (Scholtz 2005; Thomson 2020). Similarly, improved outcomes for kangaroo management must be advanced proactively and adaptively managed according to informed National, State and Regional policies and on-ground actions by public and private land managers (McLeod & Hacker 2019).

We have demonstrated widespread support and secured credible endorsement for the immediate and profound overhaul of macropod management policy. Organisations supporting this Statement recognise that advocating for change, especially advancing proactive management that includes population control, may appear counterintuitive to some animal rights ideologies that oppose killing of healthy animals. Animal rights advocates need to be aware that starvation, which represents the most significant conservation and welfare risk to those macropod species that are prone to unsustainable population increases, has been responsible for significantly more kangaroo deaths and serious animal welfare issues in recent decades than has lethal control. It is resource availability, even in areas ungrazed by domestic stock, that drive key risks to kangaroo populations (Portas & Snape 2018). The Australian Capital Territory has provided a template whereby resource (grass) availability should govern adaptive management of macropod populations, which should be replicated in other jurisdictions for the benefit of kangaroos and other biodiversity (Gordon *et al.* 2021).

The papers compiled and referenced in this special edition reinforce that outcomes for kangaroos and other biodiversity will be enhanced by damping populations so they do not exceed sustainable carrying capacity. Misleading and unsubstantiated claims that large kangaroo species are generally in lower densities than historic levels and that harvesting threatens them with extinction are demonstrably refuted by scientific evidence, including one of the most comprehensive long-term wildlife monitoring programmes anywhere in the world (McLeod *et al.* 2021; Finch *et al.* 2021).

Ironically, kangaroo population control is especially important within conservation areas, including National Parks (Prowse *et al.* 2019; Morgan 2021; Pedler *et al.* 2021; Freeman and Pobke 2021), Conservation Reserves (Finlayson *et al.* 2021; Gordon *et al.* 2021) and especially fenced Nature Reserves (Moseby *et al.* 2019; Coates 2021; Treloar *et al.* 2021), that are managed primarily for

Box 2 Potential opportunities in the Commonwealth Environment Act

The EPBC Act:

- gives effect to the Commonwealth's commitment to ensure the principles of ecologically sustainable development are taken into account in policy and decision-making process
- recognises the vital role Indigenous Australians and their knowledge play in the conservation and sustainable use of Australia's environment and heritage
- facilitates cooperative arrangements with the states and territories
- implements international commitments on biodiversity, heritage and other relevant matters
- provides a framework for managing Commonwealth parks and reserves, and · promotes biodiversity protection and recovery

conservation. Fertility control (Herbert *et al.* 2021; Wimpenny *et al.* 2021) and macropod fencing combined with one-way gates (Pedler *et al.* 2021) have the potential to limit macropod overabundance in some of these intensively managed areas.

In cases where apex predator control of macropods is incompatible with land uses, some Indigenous, agricultural, ecological and animal welfare stakeholders call for macropod populations to be regulated by accredited harvesting, rather than wasteful culling or abhorrent starvation and road trauma. Reinstating or introducing more kangaroo meat into diets could play a major role in 'healthy people healthy communities' (Wilson *et al.* 2010). Harvesting by accredited and monitored marksmen, with policy, monitoring and marketing support, should provide the optimum tool for restoring an ecological balance to kangaroo populations to prevent impacts of overgrazing and tragic mass die-offs (Wilson & Edwards 2021).

Now is the time for decisive evidence-based policy and actions.

There are many aspects to developing effective management strategies for kangaroos to prevent the adverse impacts that arise when their populations are overabundant. We have discussed some of these but other questions that require consideration include the following:

1 Should Australians regard kangaroos as a resource to be integrated into rangeland production systems?

2 What is the potential contribution of commercial use of kangaroos to economic diversification in rural communities?

3 Is it possible to increase the value and demand by improving quality, reliability of supply, more accurate description and better marketing of the natural attributes of kangaroos?

4 Should landholders be eligible for carbon and biodiversity credits from better kangaroo management?

5 Can they be granted custodianship or leases to kangaroos on their properties?

6 How can Indigenous rights, responsibilities and opportunities best be incorporated into kangaroo management?

7 What is the legal liability and responsibility of governments for the welfare and husbandry of wildlife?

8 What is the legal responsibility of government conservation agencies to protect the conservation of other animals and plants affected by high numbers of kangaroos?

Conclusion

This Statement seeks to succinctly present the shortcomings and outcomes of contemporary kangaroo management and to guide policy formation to address these issues.

A national, collaborative approach, featuring evidenced-based decision making and education of the public is needed to build a broad social mandate for improved management of kangaroos in Australia.

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