



Portfolio Committee No. 7 – Planning and Environment  
Inquiry into the health and wellbeing of kangaroos and other macropods  
in New South Wales

Supplementary Questions for the Kangaroo Management Taskforce (KMT)

The Kangaroo Management Taskforce has done our best to answer the supplementary questions from the Parliamentary Inquiry committee with respect, even though we have also been surprised to receive so many questions about submissions from others and/or assertions not relevant to our own submission to this inquiry. As this exercise has involved our volunteer Taskforce members having to read, review and discuss other submissions and the transcripts of other sessions to develop responses to these 12 supplementary questions, we appeal to the Committee to take the time to seriously consider our responses and all information tendered by reputable and respected organisations.

***Question 1 - Given the homepage of your website states kangaroos are one of the most abundant wild mammals in the world, can you confirm if the kangaroo population ever been scientifically counted and verified in NSW as opposed to monitored and surveyed, and if “abundant” is a scientific term?***

*The Kangaroo Management Taskforce accepts the population estimates approach in NSW*  
The NSW Government undertakes annual aerial counts in the harvest zones, and the Kangaroo Management Taskforce (KMT) accepts the science that underpins the populations estimates as does RSPCA Australia in their submission “*the RSPCA understands that the methodology used to estimate population densities of kangaroos and other macropods has been scientifically assessed to be reasonably accurate.*” Please also note that a position for RSPCA NSW membership has always existed on our KMT, occupied during our 5 years existence by a few different representatives.

As far as we are concerned, the fact that population trends follow the same pattern as seasonal trends as shown in the graph below further reinforces the population estimates and confirms regional observations about kangaroo populations. The trends demonstrated in the following graph created from the established estimates and showing how kangaroo populations increase (boom) in good seasons and decrease (bust) in dry seasons is most significant and cannot be ignored.

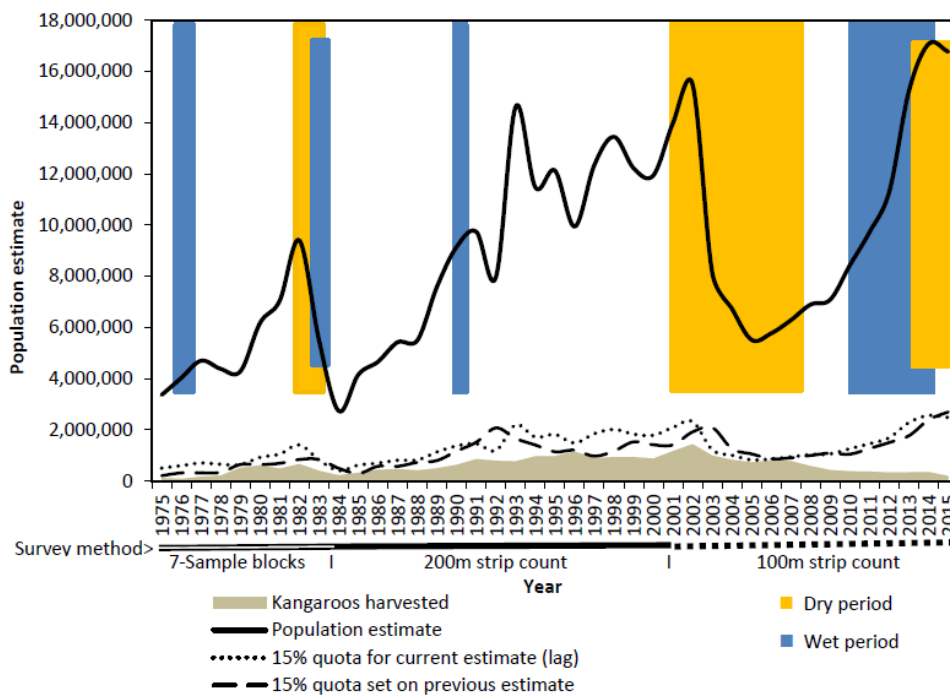


Figure 1 taken from the New South Wales Commercial Kangaroo Harvest Management Plan 2017-2021 (NSW, 2017) Fluctuation in absolute NSW kangaroo populations between 1975 and 2015. The Graph shows temporal variation of kangaroo populations in relation to wet and dry periods during commercial harvest activities. The pattern of a slower population recovery, following sudden decline of kangaroo populations, is similar throughout the period. Kangaroo populations have not been affected by the rate of harvest, under the method used to set a quota. Survey methods to estimate population size have varied over time from monitoring seven sample blocks (striped line), to 200-metre (black line) and 100-metre strip transects (dotted line)

*Our members consider actual kangaroo population numbers are much higher than the estimates*  
 Although the KMT accepts the population estimates developed by the NSW Government we would like the Inquiry committee to note that those population figures do not account for **all** kangaroos in NSW. They only represent:

- The harvestable kangaroo species within the 12 x harvest zones and DO NOT INCLUDE kangaroos outside those zones OR the kangaroos in national park or conservation areas WITHIN those zones.
- Species of kangaroos that are harvestable within a particular zone. For example, Euros are not counted in the Western harvest zones as they are not harvested there, despite the fact that many landholders claim that Euro populations are significant in those areas.

Because of these factors the KMT contends that kangaroo populations in NSW are actually HIGHER than those reflected in the population estimates and the KMT has been recommending for some time that kangaroos in National Parks and reserves should also be counted, and managed responsibly on conservation sites to ensure biodiversity outcomes within those areas as undertaken in other states. Victoria undertakes kangaroo management in national parks (Gowans, Gibson, Westbrooke, & Pegler, 2009) and [South Australia has recently moved to allowing commercial kangaroo harvesting across their entire state](#), including national parks, and excluding only the Adelaide metropolitan area and *Alinytjara Wilurara Lands* for cultural reasons.

*Scientifically counted?*

The KMT is not 100% sure what the committee question means when it says “scientifically counted” but we are inferring it means that all the kangaroos in the harvest zones should be counted individually? In answer to this part of your question we would like to point out that there are 12 x kangaroo management zones in NSW and the area of the 9 x Western Plains zones alone exceeds

510 000 square kilometres, not including national parks within those areas. (Western kangaroo harvest zones include Tibooburra, Broken Hill, Bourke, Cobar, Lower Darling, Narrabri, Coonabarabran, Griffith North and Griffith South). The KMT would suggest that counting every single kangaroo within an area of this scale is not at all practical. It would be prohibitively expensive and time consuming, which is why scientifically credible surveying and modelling are required as is the norm across global wildlife monitoring programs internationally.

#### *Abundance*

Abundance is most definitely a recognised ecological term as described in [Chapter-7-Glossary-of-Ecological-Terms.pdf \(boem.gov\)](#)

***Question 2 – Given your website states that the NSW kangaroo population peaked in 2016 at 17.4 million, trebling from 5.5 million in 2005, can you explain how that figure is calculated given that the population comprises of male/ female sex parity, a percentage of immature females and that it takes at least one year to raise a joey to independence, plus the high rate of predation on juveniles?***

*The figures quoted are not calculated, they are taken from the NSW Government annual reports*  
The Kangaroo Management Taskforce have not “calculated” the population figures quoted on our website, and never claimed to have calculated them. The figures are taken directly from reports on the Kangaroo Management Program website and as stated in Question 1 the KMT accepts the science that underpins these population estimates. We believe that the estimates are reached using scientifically robust, peer-reviewed approaches and they are reliable for demonstrating population trends over time. As such we don’t accept that any perceived concerns over male/female sex parity, time taken to raise joeys or rates of predation as mentioned in the question are relevant as they have not been factored into any “calculations” because the KMT didn’t make any calculations.

#### *Breeding rates and predation*

However, we would argue that all those points highlighted in this question are highly questionable due to there being greater than 70% male bias in the harvest, that breeding rates vary with seasonal conditions, and that there are very low predation rates in NSW due to high rates of wild dog control which also suppresses fox numbers as a complementary outcome. The KMT would be interested to see any reputable references that the committee can provide regarding the high predation rate of juvenile kangaroos in NSW. Is the Inquiry committee suggesting the predation comes from Eagles?

***Question 3 – What is your opinion of THINKK’s criticism of the NSW Kangaroo Management Plan as not reflecting the ecological role of kangaroos in the landscape?***

After seeking out the THINKK submission to this Inquiry and reviewing the content, the KMT rejects THINKK’s assertion that the ecological role that kangaroos have in the landscape warrants the cessation of commercial harvest or other management actions, to be replaced by compensation or incentive schemes.

#### *False assumption that kangaroos cannot deplete pastures or initiate landscape degradation*

The ecological role of soil disturbance, seed dispersal and fire suppression cited by THINKK is feasibly valid at a small plot scale but has not been observed or tested at paddock or landscape scales and certainly fails to present a tested basis for alternative management. THINKK proposes the use of incentives or compensation to encourage landholders to remove livestock from grazing lands when biomass is depleted to a threshold but allow kangaroos to remain. This appears to be an ideological view that the remaining kangaroo population will not further deplete pastures, initiate landscape degradation and biodiversity decline, or result in poor welfare outcomes through starvation. The

KMT rejects this alternative approach as failing to address the Western Region issues outlined in the KMT submission, avoiding the broader issues of the welfare of native species by taking a simplistic single species viewpoint. Leon Zanker already described in detail an example contradicting the above assertions during the Inquiry video session on 11 June.

The KMT would like to remind the Inquiry Committee of one of the key points we made at the beginning of our evidence giving session:

*Every consideration relating to kangaroos, including their health and wellbeing, **must be considered in the context of the big picture** as defined by the Biodiversity Conservation Act from an ecological perspective, in the big picture of relevant legislation and duties of animal welfare and care and in balance with socio economic considerations.*

The KMT does not believe that the simplistic alternative model put forward by THINKK addresses those big picture issues especially considering that even the Biodiversity Conservation Trust provide explicit [guidelines for managing overabundant kangaroo populations](#) to assist in achieving conservation outcomes within agreement areas. (Trust, 2020)

#### *Evidence of impacts of ecological damage caused by kangaroos*

The THINKK submission also asserts that kangaroos are not killed because of ecological damage and that their impacts are not audited. However, there are a number of peer-reviewed research papers that document the impacts of kangaroo overgrazing. The KMT suggests that if the committee was serious about understanding the impacts of kangaroo grazing they look at some of the published research listed below.

Mills, C, Waudby, H, Finlayson, G, Parker, D Cameron, M and Letnic, M (2020). Global Ecology and Conservation. (Mills, et al., 2020).

[Special TGP edition of the Rangeland Journal](#) published in 2019 (includes a number of scientifically robust, peer-reviewed papers exploring the role of kangaroo grazing) (Edition, 2019)

The [ACT Kangaroo Management Plan](#) (Parks, 2010) and [Eastern Grey Kangaroo: Controlled Native Species Management Plan](#) (Fauna, 2017) which provide ample scientific evidence for the need for kangaroo management for conservation outcomes.

#### *Broad support from conservation organisations and ecologists for better kangaroo management*

The committee may also be interested in a special kangaroo edition of [Ecological Management & Restoration](#) to be published in the next few months, which will include 26 peer reviewed papers from respected Australian scientists on the ecological/conservation issues associated with poor management of kangaroos. The special edition will list a number of respected conservation, ecological and wildlife organisations who recognise that conservation practices must move beyond a compassionate focus on the welfare of individual animals (or even individual species) at the expense of the bigger ecological picture. The following well-respected organisations are publicly willing to acknowledge their support for improving management of kangaroos to avoid the poor environmental and animal welfare outcomes from population irruptions.

*Arid Recovery  
Australasian Wildlife Management Society  
Australian Mammal Society  
Australian Rangeland Society  
Australian Veterinary Conservation Biology Group  
Bush Heritage Australia*

*Conservation Council of South Australia  
Ecological Society of Australia  
Friends of Grasslands Inc.  
Greening Australia  
Nature Conservation Society SA  
Nature Foundation SA*

***Question 4 – Can you confirm how many First Nations people have been employed in the kangaroo industry, and name all Indigenous organisations that have been contracted to provide services?***

The Kangaroo Management Taskforce is not an industry body and has no records of Indigenous representation in the kangaroo industry. The KMT recommends that the committee refer this question to the kangaroo industry itself.

However, the Kangaroo Management Taskforce strongly supports Indigenous involvement in the development of any new approaches to kangaroo management in NSW and elsewhere in Australia. At a minimum, we believe that such involvement should involve the following:

- Genuine consultation and collaboration with all Indigenous communities, including those in regional and remote areas, those for whom kangaroos are their totem, as well as those for whom kangaroos have been an important food source for tens of thousands of years
- Authentic opportunities for increasing Indigenous employment and enterprises related to kangaroo harvesting, processing and marketing
- Improved access to kangaroo products (and other traditional foods) for Indigenous communities

KMT initiatives aimed at increasing Aboriginal engagement in the kangaroo management issues are outlined in more detail in the supplementary document addressing one of the questions taken on notice.

In addition to the examples outlined in the attachment the KMT regularly and proudly celebrates and shares on our Facebook page news stories about the involvement of Indigenous individuals and organisations in the kangaroo industry, cooking kangaroo recipes and/or other Indigenous bush food initiatives.

***Question 5 – What is your response to claims that agriculture and the colonialist-changed landscape causes mass kangaroo starvation and thirst?***

The KMT rejects claims that “agriculture and the colonialist-changed landscape causes mass kangaroo starvation and thirst” and seriously questions the credibility of who has made such a claim and if there is any scientific basis for it? We certainly question whether these claims were meant to apply to the semi-arid rangelands of western NSW and in attempting to respond to this question, the KMT will mostly be referring to these landscapes. The KMT was formed in western NSW, much of our representation is from that region which also represents a large part of the kangaroo harvest zones. Indeed we were originally named the Western NSW Kangaroo Management Taskforce.

As mentioned western NSW is mostly comprised of semi-arid rangelands and, frustratingly these regions are often vastly misunderstood by most Australians who live in urban and coastal areas. Rangelands represent more than 75% of Australia and 40% of NSW but are often disregarded and undervalued by those with a limited understanding of the function and biodiversity values of rangelands. There is increasing impetus worldwide to better understand and value rangelands in terms of global food security and environmental services and the FAO recently endorsed an international campaign for 2026 to be declared the [International Year of Rangelands and Pastoralists](#).

“Agriculture” in the semi-arid rangelands of western NSW mostly involves low-intensity pastoralism and unlike other regions of NSW that may have changed vastly since colonisation, these landscapes remain quite similar in ecological function (not condition) to the pre-settlement state. 95% of the western NSW rangeland landscape remains uncleared and is dominated by native vegetation in

various condition states. Rangelands are generally large natural areas under native vegetation where the biodiversity value lies in maintaining (or regenerating) native pastures through managing the grazing of herbivores. In these areas pastoral production outcomes are closely linked to natural resource management outcomes: the better the pasture, the better the production results for the pastoralists. In such regions the main management tool involves managing overall grazing pressure and providing native pastures with periods of rest.

As detailed in the KMT submission, one of the critical changes affecting kangaroo populations has been the minimisation of predation by dingoes. Other factors such as the installation of artificial watering points have also been critical for increased survival and increasing the landscapes available to the more sedentary, and slightly more water-reliant, grey kangaroos. (Hacker & McLeod, 2003) In addition to increasing the habitat availability, creating more favourable environments has also enhanced the opportunistic breeding capability of kangaroos and this has resulted in an increased irruptive pattern in kangaroo numbers as the population has been released from natural constraints and increases at maximum capacity during favourable seasons, otherwise referred to as population “booms”.

Conversely, the onset of unfavourable seasons can precipitate rapid population declines as the grazing pressure of kangaroos exceeds forage supply. As western NSW has a highly variable semi-arid climate, periodic drought is inevitable, creating forage shortages for all herbivore species. Similar outcomes have been documented in wildlife populations overseas, where predation has been eliminated and large herbivore numbers have escalated. For example approximately 6 million Whitetail Deer are harvested in the USA alone each year and yet there is an abundance of research demonstrating the adverse ecological impacts of deer population irruptions, with some concerns that the damage may be irreversible. (Tremblay, Cote, Rooney, & Dussault, 2014) (Pursell, Weldy, & White, 2013)

It is the contention of the Kangaroo Management Taskforce that it is a lack of effective management to prevent the exaggerated *boom* aspect of the cycle by the “owners” of the kangaroos (the Crown – as represented by our elected Parliamentarians) which ultimately leads to unmanageable kangaroo populations, associated overgrazing and landscape degradation which then culminates in the onset of drought and the starvation of millions of kangaroos.

***Question 6 – Given the drought has broken and your website states you use kangaroo management like exclusion fencing to regulate kangaroo movement in drought, why are there still hundreds of kilometres of exclusion fences up?***

First of all, the drought has not broken in all areas of NSW and the KMT also recognises that the ‘breaking of drought’ under current kangaroo management policies just signals the start of the next kangaroo population irruption cycle.

Secondly the KMT disputes the fact that our website states that “we use exclusion fencing to regulate kangaroo movement in drought” Is the Committee able to indicate where this is stated?

The KMT *does* recognise and support the role of fencing as a *tool* for managing grazing pressure from both managed and unmanaged herbivores with the goal of conserving groundcover and regenerating pastures. As stated in our answer to Supplementary Question 4, most landscapes in western NSW are native pastures with great significance for biodiversity.

Thirdly, exclusion fences are not as extensive as suggested as implied in this question and contrary to the misconception evident in it, there are not huge amounts of exclusion fencing criss-crossing

western NSW. Most properties still use stock-proof or Total Grazing Pressure (TGP) fences. The only really large-scale cluster exclusion fence in NSW encompasses 177,000 hectares and 22 properties and kangaroos can readily move in response to pasture growth within an area of this scale.

Fencing has been used for generations as a tool to regulate grazing pressure from all species and is important both in favourable seasons and in drought. The control of grazing pressure is necessary at all times, not just in periods of drought, to:

- Ensure that levels of ground cover remain adequate to prevent wind and water erosion
- Ensure that a diversity of pasture species can persist given that all herbivores are highly selective in their grazing habits
- Ensure that new pasture plants can establish after rainfalls without being subjected to grazing.

Most importantly, contrary to what is implicit in this question, exclusion fences do not come in a Lego box that can be put up and pulled down at will. Such fences cost in excess of \$8000 per kilometre and erecting them involves a significant commitment of time and labour. Exclusion fencing represents a long-term investment tool to implement grazing management strategies to improve landscape condition across seasons and the expected life of a fence is generally about 20 years. These fences are designed to be permanent infrastructure to address long-term management objectives and are not set up for seasonal usage.

#### *Landholder requirements to manage grazing on Crown Land leaseholds*

The KMT would like the committee to note that 94% of the Western Division is Crown Land, virtually all held by landholders with Western Lands leases. A legal requirement for holding such a lease is to ensure that leaseholds are not overgrazed. Leaseholders are legally obligated to protect the land which they are managing on behalf of the NSW public, and as part of that they must take measures to prevent overgrazing. Just as these leaseholders are legally obliged to maintain fences to manage the grazing of their stock, they have no choice but to use suitable fencing to manage kangaroos to fulfil their lease requirements in preventing overgrazing. In addition to managing herbivores, exclusion fences are also designed to manage the movement and incursion of pest animals, another obligation of landholders with Western Lands leases.

During drought, when groundcover levels decline, fencing is an important tool to manage the grazing of all herbivores so minimal levels of soil protection can be maintained. When droughts break, new growth must then be closely managed to ensure that highly palatable plants can re-establish from seed to form mature plants. During favourable seasons, rangelands should be regularly spelled (such as through rotational grazing practices) to ensure that the most palatable plants are not eliminated, that groundcover is maintained, and that maximum infiltration of runoff is achieved. Well-managed rangeland pastures provide the best environment for a broad spectrum of native species, not just kangaroos. (McDonald, Lawrence, Kendall, & Rader, 2019) (McDonald, Reid, Waters, Hunter, & Rader, 2019) (McDonald, Reid, Waters, Smith, & Hunter, 2018)

The Chair of the Kangaroo Management Taskforce also submits to the committee that he spent 11 years as Chair of the Wild Dog Destruction Board and during that time he did not hear of, or see, a single case of a kangaroo being caught or tangled in the 600 km Wild Dog (Exclusion) Fence that has bordered NSW from Queensland and South Australia for more than a century. Mr Wise feels this is a long established NSW Government legislated example demonstrating that well-constructed exclusion fences do not result in kangaroos becoming caught or tangled in such fences, either on the QLD or SA sides of the fence where dingoes prevailed and chased kangaroos, or on the NSW side. Occasionally a minor stretching of the fence could be seen as a result of a kangaroo or emu running into the fence when disturbed by a vehicle, but never evidence of being caught.

As stated in our written submission, there is evidence that a number of native animal species, particularly threatened species, benefit from exclusion fences. To date, informal assessments also suggest that exclusion fencing may pose less of a short-term physical entanglement risk to kangaroos than conventional plain fencing, as they are less likely to attempt to go over. Having said all of that, the Kangaroo Management Taskforce acknowledges that there has been no long-term systematic assessment of the impact of pastoral exclusion fencing on kangaroos or other wildlife in NSW, although exclusion fencing for conservation purposes has been well accepted for many years. The Kangaroo Management Taskforce suggests that this may be a useful direction for new research. In 2019 some of our members contributed to the development of a research proposal to investigate the impacts and opportunities of different types of fencing and we continue to support the idea of this research being funded.

***Question 7 – Given your submission relies on “first-hand observations” when considering the Western region’s supposed overpopulation of kangaroos, can you explain how first-hand observations are collected and collated, including how many landholders have noticed overpopulation?***

*How are first-hand observations collected and collated?*

The KMT itself does not have a formal process for collecting and collating “first hand observations” but when kangaroo management and overgrazing are regular agenda items at the meetings of all landholder organisations such as *NSW Farmers, Western Lands Advisory Committee, Western Landcare* and *Pastoralists Association of West Darling* that’s a clear indication of the depth of the issue.

In addition, KMT has access to the comprehensive landholder social benchmarking surveys undertaken by Western Local Land Services every three years, which includes some questions and data about the issues associated with managing kangaroos. The latest report can be found [here](#).

The KMT believes that as landholders are the informal caretakers of kangaroos on behalf of the Crown (who actually OWN the kangaroos) there’s no-one better than landholders to provide observations and we will continue to provide a platform for landholders to express their observations and opinions.

The 2016 Kangaroo Management Workshop in Cobar where the KMT was formed, was instigated by discussions between *Western Local Land Services* and the *Western Lands Advisory Committee* who shared significant concern about increasing kangaroo numbers and the associated landscape management and animal welfare issues that would inevitably result from that impending boom and bust which did end up playing out over the next few years with kangaroo numbers reaching record highs of >17 million in 2016 and subsequently dropping down to approximately 10 million in 2020. The KMT submits that this is an unacceptable animal welfare disaster.

The KMT also notes that in their submission RSPCA Australia, the preeminent animal welfare organisation in Australia, also make the following statement: *The RSPCA recognises that kangaroos must be managed to protect their welfare (especially during times of drought) as well as to mitigate negative environmental and agricultural impacts.*

*Supposed overpopulation?*

The KMT notes the use of the word “supposed” in the question put forward by the committee and acknowledge that we are aware of the [Aussie Summer Kangaroo Count](#) project designed to use travellers to confirm or deny whether kangaroo numbers are really as high as those who LIVE in those regions would suggest. The KMT would like to point out a few things in response to this. One,



we acknowledge that kangaroo numbers are lower than usual at the moment – that is because many millions of kangaroos starved to death during the recent drought, and that is one of the issues we would like to see addressed by improved kangaroo management. Secondly, kangaroo numbers are beginning to recover as parts of the regions recover from drought, but kangaroos are basically nocturnal and even when numbers are high they are usually not that visible to people just travelling through the arid regions during the day, unless those regions are in severe drought and starving kangaroos are reduced to looking for a green pick along the roadsides and table drains. That doesn't mean they are not there.

Rather than answering the question about how many landholders have noticed the overpopulation of kangaroos, because we believe that would include *all* land managers in western NSW including those on national parks and reserves, the KMT actually challenges the committee to find *anyone* who has lived in western NSW for any length of time who has *not* witnessed either large numbers of kangaroos in good seasons, the horrific suffering of kangaroos starving to death during drought or been reduced to travelling only in daylight due to the “kangaroo curfew”.

Further to that, the KMT suggests that the committee might consider also contacting trucking companies that utilise our outback highways carting freight locally and interstate, whose hundreds of drivers will attest to the many thousands of kangaroos smashed to death by their trucks. Ask them if they are imagining the overabundance of kangaroos following good seasons? You could also consider consulting NRMA and Authorities responsible for highway and road management to establish their “first-hand observations” relating to cyclical trends in roadkill and associated insurance claims.

***Question 8 – Given the four different survey methods used by DPIE over time, can you justify how you can rely on their statistics when making kangaroo management decisions?***

*Of course survey methods change as new scientific information becomes available*

The KMT would contend that it is precisely BECAUSE the survey methods have changed and evolved over time that assures us that the DPIE statistics are reliable as it indicates their willingness to change and improve their approaches as new and better population survey techniques and counting methodologies become available.

NSW Government has been researching and monitoring kangaroos under the NSW Kangaroo Management Program since the 1970s. Over this period progressive refinement and improvements have been made to the design of surveys to estimate kangaroo population size, based on the best available science. As stated in Question 1, the KMT also feels that the population graphs show kangaroo populations rising and falling in response to flood and drought, as would be expected of an accurate population survey method.

*Kangaroo Management decisions?*

Again, the KMT is not exactly sure what is meant by this question? The KMT itself doesn't make kangaroo management decisions – we are a group advocating the development of more strategic long-term approaches to kangaroo management, but we are not involved in regulation, policy or quota setting. If you mean the DPIE kangaroo management decisions, the KMT accepts the validity of the statistics provided by DPIE in terms of understanding populations and decision making in terms of setting appropriate quotas at the zone level. However, if you are referring to kangaroo management decisions at the property scale, the statistics would really only affect landholders in zones that are closed for harvesting as they would be unable to access commercial harvesting for commercial management.

The Kangaroo Management Taskforce has always promoted ongoing research to improve best practice approaches to kangaroo management and this would also apply to population monitoring. If there's a viable, more effective way of doing it than is currently being used we would support the consideration of that, but we currently believe that the NSW Government is using the best practice approaches they have available.

***Question 9 – Given your submission outlines concerns that the survey data does not support decisions at the property level, can you please recommend how these challenges can be overcome when the DPIE state that their statistical methods used to monitor populations is the “best available” for broad scale wildlife?***

As explained in Question 8 the KMT fully accepts that the statistical methods used to estimate and monitor populations in NSW is the best available for broad scale wildlife. **However, monitoring kangaroo populations is not the same thing as managing kangaroo populations.** These are completely different things.

The Kangaroo Management Taskforce would like to see kangaroo management programs become more effective at mitigating against the impacts of the irruption boom/bust cycles in their populations including adverse impacts on caretaker viability, landscapes, biodiversity and the kangaroos themselves. The current approach to kangaroo harvesting in NSW and most other states involves counting the populations at zone levels and setting quotas for the next year based on the population estimates within those zones. We consider this a reactive approach rather than a proactive approach, which doesn't take into account changing seasonal conditions, impacts of kangaroos on landscapes or biodiversity, localised population irruptions or the movement of kangaroos between zones.

The current approach involves understanding kangaroo populations at the zone level, but the reality is that land management takes place at the property scale and the KMT supports improved understanding and tools for managing the grazing pressure from kangaroos at the property level. This in no way contradicts or detracts from the broader zonal scale monitoring of kangaroo populations currently in use which are necessary for understanding population levels, dynamics and trends to ensure the long-term viability of kangaroo populations.

***Question 10 – Could you please outline how a bigger picture kangaroo policy is possible given the DPIE state that their statistical methods used to monitor populations is the “best available” for broad scale wildlife?***

The KMT stated in our submission that Kangaroo management requires a big picture approach that prioritises welfare but also recognises the underlying issue of an ecological crisis of overgrazing by irruptive kangaroo populations. This overgrazing is affecting over one third of continental Australia, mainly the southern rangelands of NSW, South Australia, Western Australia and parts of Queensland. Individual issues such as harvest quotas, joey welfare and the use of exclusion fencing are components of the broader challenge to find acceptable solutions to the big picture.

Current kangaroo management harvest policies in NSW are framed in the context of satisfying only two key principles:

- 1 – To ensure the ecological sustainability of the kangaroo and
- 2 – To ensure all animals taken are done so in the most humane way possible.

The current zonal based population monitoring data is sufficient for achieving those goals but does nothing to prevent the mass starvation events and environmental degradation that results from the cyclical overpopulation of kangaroos.

*It does nothing to ameliorate the impact of kangaroos on themselves as a result of drought.*

*It does nothing to ameliorate the impact of kangaroos on native flora.*

*It does nothing to ameliorate the impact of kangaroos on other native fauna.*

*It does nothing to ameliorate the impact of kangaroos on agriculture (pastures, crops, fences).*

The Kangaroo Management Taskforce believes it is time to develop new proactive and predictive kangaroo management models that address the needs of ALL the stakeholders impacted by kangaroo management including. These new approaches should address humaneness, compliance, streamlining of government delivery, better coordination of commercial and non-commercial management and be developed through a transparent, collaborative process involving input from:

- Population ecologists
- Traditional owners
- Land managers
- Animal Welfare experts
- Government regulators
- Landscape ecologists
- Kangaroo industry

***Question 11 - Could you please advise how the funding you have received to partly address the issue of property level population dynamics will be spent and therefore achieved?***

***(a) Will this project be in line with world methods of using imagery to provide population estimates and not based solely on predictive modelling?***

***(b) Could you please explain how the predictive modelling will be undertaken?***

Understanding and planning for grazing pressure at the property or paddock scale is key to managing semi-arid rangelands in preparation for drought and long-term landscape and economic resilience. A large component of grazing pressure in the southern rangelands comes from kangaroos and unmanaged goats. These animals cannot be destocked during drought in a similar manner to domestic stock. Existing kangaroo census information is collected at a regional scale and there are no predictive models that allow land managers to forecast the likely forage demands of unmanaged herbivores at a property or paddock scale.

To address this issue Western Local Land Services has received funding under the Commonwealth Government's Future Drought Fund to undertake a pilot study to predict the distribution and density of unmanaged herbivores at a property level scale. One of the main aims of the study is to provide landholders with an online tool that they can use to estimate the grazing pressure from unmanaged herbivores.

- i. Part of the funding will go to researchers from NSW Department of Primary Industries to develop the predictive tool
- ii. The project funding will also be used by Western Local Land Services to cover the salary of the project manager
- iii. Part of the funding will be used to cover project costs including Steering Committee meetings and field days
- iv. Part of the funding will be used to develop communication tools including podcasts and videos

*In answer to (a)*

Researchers from the project team will survey kangaroo populations to ground-truth the predictions of the tool on five properties in western NSW. Methods of survey will include walked transects and aerial drone transects.

*In answer to (b)*

The tool will analyze annual population estimates from Kangaroo Management Zones throughout western NSW, along with climatic and remotely-sensed (satellite) data (e.g. vegetation type and structure, vegetation greenness, estimates of plant growth etc.) and combine these different sources of information into a spatial model that will predict the distribution and density of unmanaged herbivores at much finer spatial scales than have previously been attempted.

**Question 12 – Could you please outline how the harvest quota fails to meet the needs of landholders and it is that you accept the population estimate numbers, but you don't accept the quota estimate numbers?**

The KMT is not sure what you mean by this question? We have never said that we don't accept the quota estimate numbers. It is also incorrect to say that the KMT has claimed that the harvest quota fails to meet the needs of landholders.

As was mentioned in our testimony to the Inquiry Committee, historically when the quota **was** fully utilised by the commercial industry, landholders felt they were getting relatively good kangaroo management and, in those circumstances, typically did not need to undertake any additional kangaroo control through non-commercial culling. The problem for landholders stems from the fact that the **quota is no longer fully taken**. Consider these facts taken from the annual kangaroo harvest reports on the Kangaroo Management Program website.

Table 1: NSW commercial harvest data from 2015- 2019.

Year	NSW kangaroo Population	Commercial Quota	Actual Harvest	Harvest as % of Quota	Harvest as % of Population
2014	17,071,705				
2015	16,196,802	2,686,988	357,189	13.3	2.1
2016	17,256,357	2,547,318	352,464	13.8	2.2
2017	14,202,962	2,715,912	453,021	16.7	2.6
2018	12,631,495	2,223,779	467,456	21.0	3.3
2019	13,861,850	1,874,076	547,318	29.2	3.9
Totals:		12,048,073	2,177,448	Ave. 18.8%	Ave. 2.8 %

\*Figures taken from the 2021 Quota Report New South Wales Commercial Kangaroo Harvest Management Plan 2017–2021. The quota is set as a percentage (15 – 17 % (reds)) of the previous year's population.

To put these figures into a seasonal context, 2016 was a very good year, 2017 not so good and after that we entered into one of the worst droughts we've ever experienced. In three years 2016, 2017 and 2018 when landholders needed to have kangaroo numbers managed the most because of record high populations the average harvest **take** was only 17.1% of allowable quota, equating to only 2.7 % of kangaroo populations. With commercial harvest *takes* being so low, landholders are forced to resort to non-commercial culling to try and reduce grazing pressure from kangaroos. In other words, the kangaroos are killed anyway, but those culled under damage mitigation permits are generally shot by less qualified shooters and are left to rot in paddocks rather than being valued and utilised as a resource. This is an unfortunate adverse outcome from well-intentioned animal activist campaigns: by reducing commercial demand for kangaroo products they are simply ensuring that

more kangaroos are shot as pests. The KMT stresses the need to reinvigorate the commercial industry so it has the capability to harvest full quotas once again. The KMT has always supported the commercial harvesting of kangaroos by accredited harvesters as having better animal welfare outcomes than non-commercial culling or death by starvation.

In summary, the KMT **does** accept the population estimates developed by the NSW Kangaroo Management Program and that they are derived from best available scientific modelling methodologies. We also accept the quota estimate numbers but what we have continued to point out is that the methodology of applying a 15% to 17% (Reds) harvest quota ratio of population will not stop the irruption cycle of the kangaroo and prevent the mass starvation events from occurring. The KMT contends that the main relevance of the quota approach within the current context is to protect against excessive harvest when populations are extremely low across a whole zone.

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