

1.What indicates the lack of transparency in the current the Kangaroo Management Plan (KMP) as you indicated?

The lack of transparency and accountability is a key criticism of this program. It obscures independent verification of whether the KMP meets its objective of being 'ecologically sustainable'

The lack of transparency around how kangaroo populations are estimated and the quotas set by the KMP is of particular concern. Aerial counts of kangaroos, funded by tax payers, remain inaccessible to the public, yet similar aerial counts of water birds used to set duck hunting quotas, perhaps similarly controversial, are made available in the Atlas of Living Australia. This does not encourage confidence.

We call for the following

All information to be collected by the DPIE and stored in a central and publicly accessible database that is updated annually. Including:

- The raw counts across each commercial zone for each species
- The numbers of kangaroos have been killed non-commercially and which species
- The density threshold triggers for each commercially killed species that trigger a reduction or suspension of the quota
- The number of kangaroos shot but not retrieved;
- The number of females shot with dependent joeys; and
- The number of dependent young killed (and method used to kill).
- The number of carcasses rejected, and on what basis.

2.What do you mean by the fact KMP does not consider the health, wellbeing and protection of kangaroos?

The regulatory framework is not working. The National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes sanctions cruelty.

There is no monitoring at the point of kill for kangaroos; therefore there is no compliance for the shooters in the field..

Most shooting occurs at night with small moving targets (the head of a kangaroo). New evidence shows that up to 40% of kangaroos may be shot in the neck or body resulting in wounding and non-instantaneous death.

Incredibly, the death of hundreds of thousands of dependent young annually is considered "collateral damage", with research confirming that most dependent young are left to suffer exposure, starvation, and predation when not processed according to the code.

Kangaroo wellbeing is clearly not a concern for the KMP, with this big gap in the way the industry operates lacks any accountability surrounding the wellbeing of kangaroos

Wildlife management plans (like the KMP) need to have clear management objectives—management objectives that are consistent with the obligation to protect wildlife and the environment and have broad public support.

3. - Why do you think that the use of the term – “ecological sustainability” is meaningless in the NSW KMP

Ensuring ecological sustainability is a reasonable overall goal but it can be interpreted in many ways and more attention needs to be given as to what it means in practice. At present, without a clear operational definition, it is impossible to determine whether ecological sustainability has been achieved. The objectives of the management plan need to be specific enough that they can form a basis for informing management decisions.

Specific objectives need to be provided which contribute towards the overall goal in a measurable way and can be used to determine whether the goal is indeed being achieved. To give one example, a specific objective would be to maintain the range of a species and avoid local depletions or extinctions. This is part of maintaining the role of macropods in the ecosystem and is an important component of ecosystem sustainability. But it can be quantified and measured through sub-dividing the management areas into units that are sufficiently small to ensure that local depletions or extinctions do not inadvertently occur. Then each small area can be monitored to ensure that that objective is indeed being achieved.

In addition, if ecological sustainability is genuinely intended, a holistic perspective is needed and thought needs to be given to other issues such as the erection of fences which threaten kangaroos and affect the way they interact with the ecosystem.

Page 13 of the Management Plan notes that “In setting the quotas and analysing trends, OEH uses accepted population thresholds for each species”. There is no explanation of how the thresholds are determined, what science they are based upon and what the thresholds actually are for each species. The NSW KMP fails to define the management objectives i.e., target density for each species in each zone. Therefore, the term ‘ecologically sustainable’ is meaningless. It appears that the population density thresholds are only outlined for red kangaroos in zone 2 Broken Hill (Appendix 1 of the Management Plan (p24).

The lack of transparency and accountability is key criticism of this program. It obscures independent verification of whether the KMP meets its objective of being ‘ecologically sustainable’. From the evidence provided at the inquiry, it is doubtful that DPIE’s management of commercial killed kangaroos is sustainable.

Recommendation

All information to be collected by the DPIE and stored in a central and publicly accessible database that is updated annually. Including:

- The raw counts across each commercial zone for each species
- The numbers of kangaroos have been killed non-commercially and which species
- The density threshold triggers for each commercially killed species that trigger a reduction or suspension of the quota
- The number of kangaroos shot but not retrieved;
- The number of females shot with dependent joeys; and
- The number of dependent young killed (and method used to kill).
- The number of carcasses rejected, and on what basis.

4. - Can you elaborate on why we need to include all kangaroo mortalities when deciding on quotas.

In order to understand the impact that any activity, such as hunting, is having and to ensure that it is appropriately managed, it is standard practice to ensure that all sources of anthropogenic mortality are included in a management regime. Unless other forms of mortality are included, unintended depletions or local extinctions may occur as a result even if the hunting quota on its own is assessed to be sustainable.

For example, in its procedures for setting catch limits for hunting whales, the International Whaling Commission (IWC) assesses total human caused mortality and has agreed that all direct sources of mortality from human related causes (such as entanglement in fishing gear, or collisions with ships) should be subtracted from any catch limits.

Examples from fisheries and whaling show that unaccounted sources of human caused mortality make assessments very difficult. While management procedures should be developed that are robust to natural fluctuations in mortality, including catastrophic events such as drought, these approaches have been shown to perform poorly when there are sources of human causes mortality that are not accounted for.

5.- What would a panel of international experts look like ? Can you give examples?

Clearly, a parliamentary inquiry is not the right place for a detailed examination of the scientific methodologies of population estimates and management objectives. Major deficiencies have been exposed but these can only be addressed through in-depth collaboration bringing in experts from other fields and other countries.

When faced with uncertainty, best practise in wildlife management is to often bring together a team of international experts in order to estimate abundance. This allows experts from different fields to assess raw data and methodology. This has often resulted in quite considerable improvements to the methods, estimates and uncertainties. It makes the science underpinning the counting of wildlife populations much more robust.

Issues that such a panel need to address include:

- the determination of clear management objectives,
- how to calculate catch limits from a series of population estimates which explicitly includes their inherent uncertainty,
- the methodology behind the calculation of those estimates,
- the boundaries of much smaller management areas
- the calculation of all anthropogenic mortalities

Each of these points might require a different group of experts. The development of methods for estimating population abundance is an example where close international collaboration has been particularly valuable and productive. This has resulted in the Mark Recapture Distance Sampling (MRDS) methodology used for kangaroos. However, it is also recognised that the detail of the design and data collection of any survey are just as important as the overall methodology. The Scientific Committee of the IWC has a specific sub-committee whose job is just to examine abundance estimates. Even many published peer reviewed estimates using standard methods do not initially meet the criteria as suitable for

management purposes when subject to evaluation by an expert group. But the group are often able to make suggestions for revised analyses to address the identified issues.

A typical process for international expert review of an abundance estimate might follow that used in 2015 to examine the estimates for Hector's dolphins off New Zealand using MRDS type methods from an aerial survey. In this case a group of six experts in abundance estimation from Europe, USA and Brazil went through an iterative process of identifying issues, consulting with those involved with the work and suggesting revised analysis to overcome some of the limitations. This process resulted in estimates that the IWC agreed were suitable to inform management.

6. What are the main reasons why the EU is considering a ban on kangaroo imports

The killing of baby joeys has struck a chord with consumers in Europe and America

Due to consumer pressure several big brands have stopped selling kangaroo products
Brands like Gucci, Prada, Versace, Carrefour supermarkets

<https://www.eurogroupforanimals.org/news/kangaroo-imports-sanitary-threats-and-animal-cruelty-revealed-new-report-calling-eu-import-ban>

"The commercial hunting of kangaroos is a barbaric practice happening in remote Australia but in which we, Europeans, play a major role as consumers and biggest importer. Kangaroos are shot at night, leading to non-lethal shots that can cause horrific injuries and a slow death if the animals escape. The EU should introduce a ban on imports of kangaroo-derived products, not only because of the food safety concerns, but also based on ethical grounds." Member of the European parliament, Anja Hazekamp

These are the 3 main concerns coming from the EU

Public health - Risks of bacterial contamination of the meat, due to the butchering carried out in the field and the long, exposed, unrefrigerated transport of the carcasses.

Animal welfare - Kangaroos are shot at night, often leading to non-lethal shots and the shooting of females. Young joeys (baby kangaroos) left in the female pouch are then killed through blunt trauma to the head. At-foot joeys may be left in the field to suffer starvation and predation.

Conservation - Population estimates can be inflated; the slow reproduction rate of kangaroos is not taken into account; environmental factors such as drought, fires and loss of habitat lead to a reduction in numbers; non-commercial hunting is not monitored at all.

Reineke Hameleers, CEO at Eurogroup for Animals stated

"The **COVID-19** crisis demonstrated the urgent need to reevaluate our relationship with wildlife. Commercial kangaroo hunting is a particularly unhygienic and cruel industry not complying with European animal welfare and sanitary standards. It is time for the EU to address these sanitary and welfare concerns and to introduce an import ban."

7. What are the implications of not monitoring at the point of kill?

The lack of monitoring of kangaroo shooters was not only raised at this inquiry but was also raised during the public consultation of the review of 'The National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes', with shooters, animal protection and conservation NGO's raising significant concerns.

It is clear that the relevant regulatory agencies such as DPIE, RSPCA NSW and Animal Welfare league do not monitor kangaroo kill sites. Without monitoring at point of kill by

compliance officers or a way to verify how kangaroos are being killed we cannot be assured that they are being killed in a way that is humane and meets the above legislation and codes. Hence the department, fails to achieve good welfare outcomes for kangaroos.

Currently, there is pain and suffering inflicted on kangaroos, and the fundamental flaws and gaps in the legal framework that is supposedly designed to protect them and without any monitoring at the point of kill, this cruelty will continue.

8. Can you elaborate on what you mean by 'recognising the inherent value of kangaroos alive' and what studies could be done to research this?

What is a kangaroo worth 'alive' to the Australian landscape, culture and economy?

Tourism Australia research indicates that 70% of visitors to Australia want to have the experience of seeing kangaroos and koalas in the wild. In 2019 the tourism industry was worth [\\$43.3 billion](#) to the NSW economy.

It is time that economic studies be carried out to determine the value of kangaroos to the NSW tourism economy. The potential for kangaroo tourism is untapped

We believe Australia kangaroo tourism experiences are undervalued, under promoted and are an under-utilised economic benefit to the Australian economy.

When the commercial kangaroo industry kills a kangaroo it is worth \$30. That same kangaroo 'alive' will be worth so much more over its lifetime and could be seen by thousands of tourists bringing in much needed income and jobs.

A comparative study of humpback whales in Hervey Bay, QLD calculated what a Humpback whale was worth to the economy of that town 'alive' as opposed to what it would be worth dead. Hervey Bay is the oldest whale watching location in Australia, with its well-established tourism industry and recovering whale population, estimates the present value of a humpback whale to the Hervey Bay economy is estimated to be \$97,000. The global whale watch industry is worth over \$2 billion dollars annually. In 2008, 13 million people participated in whale watching in 119 countries and territories, generating total expenditure of \$2.1 billion.

If Australia had progressive environmental policies to regenerate our unique landscapes and let wildlife flourish, what an irresistible wildlife tourist destination we could be.

Kangaroos are the international symbol of Australia, on the coat of arms and a central and significant part in the lives of indigenous Australians for the last 60,000 years. Studies done to capture this inherent value should be at the core of any decisions in the mass slaughter of kangaroos.

9. Can you describe more of your accounts viewing commercial shooting and whether or not you think the industry is humane?

We witnessed first hand the commercial shooting of kangaroos and we did not see any monitoring of the shooting.

We saw that the commercial shooting is done in the middle of the night in the bush, a long way from anywhere.

We saw kangaroos shot and wounded, hopping away into the bush, to be shot again after several minutes

We witnessed baby joeys being left after watching their mother get shot
We saw kangaroos being hauled up on to the back of the truck, whilst still alive

We witnessed baby joeys stuck on blackberry bushes, having been thrown there the night before to die from starvation and exposure

We learnt that the governments of Australia and NSW keep no records of the number of baby kangaroo joeys killed each year by the commercial kangaroo industry

It felt like to us that the killing baby joeys had become the face of kangaroo management in NSW. They are afforded so little consideration of their value that the code simply recommends that they be bludgeoned to death.

Staggering to us that every night across Australia baby joey kangaroos are bludgeoned to death, with no monitoring, no compliance and no records being kept.

It is our experience that the killing of kangaroos is one of the worst examples of indifference and intolerance towards wildlife in the world.

10. You said you saw nothing like “plague proportions of kangaroos” – so why do you think these words keep coming up?

In our travels across NSW and QLD were shocked at how much people wanted kangaroos gone from the landscape. We wanted to understand this more. What we found dates back to early white settlement, colonial era. The desire for the first white settlers to farm the land like it was Europe meant that there was no place for wildlife here. It is our conclusion that farmers have always seen kangaroos as a problem to deal with and to be gotten rid of.

So kangaroos have been labelled pests and vermin for generations and it has stuck. We believe this has been passed from one generation to another. This demonising has resulted in language that fits this narrative. So called ‘Plague proportions’ being one of the most common.

So it is our experience that the current view of kangaroos in the NSW landscape continues to be seen and dealt with through an out-dated colonial lens.

11. Given you said you hope this information strikes a chord with Australians; what do you think Australians will think about this?

The kangaroo killing is done in the bush with no one watching, so most Australians don't know much about the commercial killing of kangaroos.

The media attention and debate resulting from the release of our film highlights just how little Australian's know about their fellow wild inhabitants.

It has been our experience that most Australians are shocked when they learn how kangaroos are treated in Australia.

Recent polling done after the NSW bushfires showed that a majority of people in NSW believe that we should stop killing kangaroos until an assessment of the damage is undertaken.

Both internationally and nationally we have noticed the majority of people we talk to are very concerned about the care and wellbeing of the kangaroos of Australia.

Most Australians want kangaroos on the landscape, so we think that Australians are open to a paradigm shift in our thinking, that we start to plan how we co-exist with kangaroos.

12. You said the government uses the “over-abundance” narrative – why do you think this is the case?

It suits their policy of being the champions of helping farmers
It is hard to contradict because its in the bush and therefore hard to monitor.

This narrative of making the kangaroo the scapegoat is much easier than tackling the serious issues of sustainability surrounding agriculture in NSW.

It comes from manipulating their own science.

However as we have heard at this inquiry the science behind counting kangaroos and the subsequent population estimates is now under serious question and under international scrutiny for the first time

It is clear from the evidence heard at this inquiry that the NSW govt. needs to undertake a detailed examination of the scientific methodologies of population estimates and management objectives.

Major deficiencies have been exposed and these can only be addressed through in-depth collaboration bringing in experts from other fields and other countries.

13. You touched on the idea of kangaroos as a tourism draw card – can you speak more to how exactly NSW and Australia could benefit from prioritizing tourism ahead of commercial killing?

Jobs and growth is often the reason given for regional industry as areas look for potential employment for its constituents. We noticed when travelling around Australia there is little to no infrastructure around wildlife tourism for kangaroos across NSW, even though kangaroos are a key national draw card for international guests.

When filming around the state we were delighted to visit NSW National Parks where there were populations of red and grey kangaroos to observe at dawn and dusk. This equalled our experience of African safaris. We questioned why the local towns were not seeing this economic and breath- taking tourist potential on their doorstep.

As noted throughout the NSW Kangaroo Inquiry the colonial perspective of Australian wildlife is alive and well in regional NSW enforcing the idea that kangaroos are seen and treated as pests to be eliminated. Yet simultaneously tourism Australia is spending millions to draw international guests to our shores with images of kangaroos in the wild, why are we not capitalizing on that within communities?

Figures show that in 2019 [\\$43.3 Billion](#) came into the state via tourism employing. The value that kangaroos provide as a tourism draw card is grossly overlooked and the commercial

kangaroo industry provides lesser employment opportunities and value to the economy in comparison.

Studies in Australia 2011 found that the monetary value of individual whales alive was \$97K. NSW Tourism should seriously a study to determine how much a statewide 'wild kangaroo tourism industry' could be worth to the economy. At present there are very rare opportunities to visit kangaroo sanctuaries as you travel around NSW. We see this as a missed opportunity.

Business ideas that would enhance kangaroo tourism include:

- Develop and promote 'the kangaroo trail' where tourists could see kangaroos in the wild
- Advertising kangaroos as Australia's iconic wildlife in regional areas with natural history and habitat information
- Having spot the different kangaroos species promotions for tourists (like bird watching)
- Proper signage at specific road crossing areas (SLOW DOWN) in the region to bring awareness to the value of kangaroos in the area
- Training council workers and locals in roadside and fence injury response to care for this precious community asset
- Creating tourism opportunities with local farmers to see kangaroos at dawn and dusk visits that could include talks, food, animal petting, homestead experience
- Creating sanctuary tourist visit to observe joeys feeding and playing
- Create home stays on farms that specifically promote kangaroo watching
- Working with local indigenous communities to take tourists to see kangaroos and teach about the indigenous connection
- Create kangaroo ecology opportunities in regional areas that would enhance local knowledge and long term care plans
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14. You talked a lot about your wide travelling so can you talk about how you have seen kangaroo populations change due to drought and how killing kangaroos during these times should alter?

We have been fortunate to travel extensively across NSW and QLD. Having been told that there was over 40 million kangaroos in Australia we were expecting to see them everywhere. We did not. We were shocked at the lack of kangaroos on the landscape.

The only 'healthy' populations we encountered were in National parks, Sturt National Park was one such place and we visited three times in 2016 and 2017 We have since learnt that a combination of drought and neighbouring shooting has decimated the population.

Kangaroo mortality in the drought is well documented. Images of kangaroos dying in the drought have been used to promote the need to kill kangaroos, to alleviate their suffering.

However the kangaroo industry are not being good corporate citizens when they promote this killing, as they do not kill the weak and suffering kangaroos (as they have no economic benefit) they kill the largest and healthy kangaroos – putting further pressure on the already severely compromised kangaroo mob structure

Dying kangaroos in a drought are a natural part of our ecosystem and we must not shy away from allowing natural selection to play its part.

However the argument that we must kill kangaroos for their own good during the drought is ludicrous, particularly when the populations are already under duress.

15. Why do you say in your submission that DPIE's management of kangaroos is "not based on science, but rather on politics and appeasing landholders who wish to eradicate kangaroos"?

Landholders have received government support to get rid of kangaroos for generations. The killing of kangaroos has become normalised behaviour in the country, This has resulted in a cart before the horse mentality, a problem to justify the actions.

This inquiry has revealed the lack of scrutiny of the govt departments charged with the 'management' of kangaroos

Claims of exploding populations and over-abundance are not scientifically valid. Kangaroos are slow breeding wildlife, able to produce on average only one offspring per year when at reproductive age (typically three or four years of age for the larger kangaroo species).

We have well known Australian and international scientists questioning the methodology behind counting kangaroos and the subsequent population estimates.

The inquiry has uncovered that the KMP is a mess, it has not been reviewed for over a generation and it has clearly morphed into policy that appeases farmers and scapegoats our kangaroos. Rather than look at the serious questions re: agricultural practices in the state, its been very convenient to blame the kangaroo.

It is time to shift the narrative to 'co-existence' with our national icon

Allow a proper review of the KMP and allow international scrutiny

Wildlife management plans need to have clear management objectives—management objectives that are consistent with the obligation to protect wildlife and the environment and have broad public support.

16. Based on your travels, do you think that modifications imposed on the landscape by agriculture has benefited kangaroos?

Far from being out of control, kangaroos do not prosper from land clearance or the installation of watering points.

Their abundance is adequately regulated by natural processes such as quality of nutrition, disease, and predation (e.g. dingoes and foxes). Loss of habitat to urban and small-scale rural development, land clearing, fencing, and agricultural practices isolate kangaroo species across regions where historical records describe them as once widespread and abundant

During our travels through arid and semi arid regions of Australia, we saw dried up waterways and seasonal wetlands which once quenched the thirst of Kangaroos and fed vegetation on riverbanks, creek sides and flood plains providing plentiful natural nourishment for Kangaroos. Water which once flowed in abundance across this land is now diverted for such activities as cropping and mining; it is dammed for agricultural animals. Our waterways no longer flow freely and naturally. Many river systems, such as the great Murray Darling, are said to be dying as will all life dependent upon them. We cannot see how the agricultural use of water can be said to benefit Kangaroos who once had free access to puddles, creeks, rivers, wetlands but are now lucky to be permitted to take a drink from a silted up dam full of agricultural animal faeces, herbicides and pesticides.

The claim that the use of Artesian water has provided a greater than normal source of water for Kangaroos is highly questionable given what we have learnt recently from trials in which Artesian bores in arid regions were turned off only to find that, by doing so, the natural cycle and flow of water resumed, creeks ran, wetlands reappeared, vegetation returned, all life flourished. The water was there before we stole it, rerouted it, and used it up for agriculture.

<https://www.queenslandcountrylife.com.au/story/6732419/hope-springs-for-re-emerging-wetlands/>

<https://link.springer.com/article/10.1023/B:WETL.0000005532.95598.e4>

The wholesale clearing of native vegetation including lush, highly nutritious native grasslands cannot possibly be seen to benefit Kangaroos. White fellows' practices have long involved utilisation of the best ground for European crops and farmed animal grazing. Where there once was an abundance of natural food for all of Australia's native animals, there are now single species crops as far as the eye can see, once again laden with chemicals to kill 'pests' and enhance growth, thousands of sheep grazing on single species paddocks with not a tree for shade in sight and barren feedlots brimming with cows eating grain, grown at the cost of Australia's grassy woodlands. How can this be to the benefit of Kangaroos who have complex dietary requirements requiring a vast range of grasses, vegetation, soils, bark, etc? Agriculture has taken over land which provided an abundance of nutritious, natural food for Kangaroos and replaced it with the equivalent of McDonald's chips.

Historical records show that Kangaroos existed in "swarms" on the very lands Australia now accommodates sheep, cows and crops prior to European settlement. Their food was already there. We destroyed it and replaced it with agriculture

And then there are the tens of thousands of kilometres of agricultural fences which block our Kangaroos' instinctual movements to healthier vegetation, less scarce water, shade in the summer and sunlight in the winter. We block them from moving away from farmland in their quest for natural, abundant food and shelter and then punish them with death because we

think they are grazing our crops or the grass we want to feed to agricultural animals or for drinking too much of 'our' water on lands devoid of cooling shade trees.

17. Based on your experience, can you expand on your submission's assertion that kangaroos that witness the death of their mob show pain and distress?

Having witnessed the behaviour of Kangaroos during and following the violent deaths of their family members, we can confirm that Kangaroos experience trauma, shock and sorrow similarly to humans. We have seen a range of behaviours in Kangaroos which are consistent with the flight, fight, appease, freeze and fold responses invoked in humans during and following exposure to events which threaten their lives, injure them or when death is imminent or witnessing the injuring or death of family members or friends.

The ranges of responses from Kangaroos to the trauma of shooting and bludgeoning, of cutting throats and hearts, watching as their loved ones have their hands and feet cut off, their head cut off, their stomachs cut open, their little brothers and sisters stomped on, is as varied as the personalities of the Kangaroos.

When faced with a shooter, some will stand valiantly in front of the vehicle, apparently to allow the opportunity for family and friends to escape, they are shot. Some will flee in terror, smashing into each other, trees, fence posts, some will stand motionless, stunned and seemingly helpless, some will gather up the little ones rather than save themselves then stand at the exit to the paddock while the little ones pass by, as if counting. Sometimes the guardian Kangaroo will stand for an interminably long time, shuffling their feet and softly gruffing every couple of minutes until, eventually, the one they're waiting for arrives, terrified and obviously not thinking clearly, and they flee together.

The one who is shot will sometimes vocalise with gentle clicks as the Commercial Kangaroo Harvester approaches to finish him off, not with the forceful coughs and growls of a Kangaroo animated by emotion, but the cajoling clicking similar to the sounds of a mother Kangaroo calling her joey back to the pouch or the sounds of friendship between the big fellow and his brothers. Are they trying to reason with their killer? We think so, having seen it time and time again.

And what of the aftermath, which sees Mothers beside themselves with grief and torment for days, and even weeks, at being unable to find their at-foot son or daughter, shot on the assumption that it was the joey of another mother or who ran and ran until they were lost. And the 'meetings' of the big fellows after nights where 40 or so of their fathers and grandfathers were slaughtered. You hear of big males jostling for hierarchy, fighting 'to the death' to determine who reproduces, who 'owns' the females, who is boss, yet our observations demonstrate a reality which could not be further from that.

In the early days of shooting, when the social structure of the mob (extended family) is still largely intact and functioning normally, some of the remaining males will 'meet' not long after the sun rises following a shooting event. There are usually 4 who stand, face to face, clicking and grunting, for up to 30 minutes. They stand at a junction of energy lines used by all of the families which have been affected by the shooting. There are no challenging, or even playful, behaviours. This looks like a serious meeting for solemn purposes. This behaviour has never been witnessed at any time except following Kangaroo slaughter. This behaviour doesn't last for long as those Kangaroos are then killed, then more and more, until there are none who have the age, wisdom and knowledge to partake in such a meeting.

And then there are the Kangaroos whose personality requires them to try to make everyone feel better. They are often the Kangaroos who stand near the escape exits calling their family members home while the shooters scour the paddocks with their spotlights, blinding any Kangaroos in their path. They stand outside the paddocks, shuffling their feet and gruffing every few minutes, like the guardian Kangaroos described above, seemingly to enable their family members who are still trapped to more easily locate the exit. It always appeared uncannily like their vocal tones would change when the shooter was a sufficient distance away for the trapped ones to make a run for it.

This behaviour, again, only occurs while there are sufficient surviving members of a family but, while true families still exist, this one will target any who are standing motionless and gently tap their arm while making very discreet, subtle clicking sounds. Eventually, the motionless one will raise his or her hands and the one who is tasked with helping will begin to groom the other. The helpful one will continue to groom and click until there is play and will continue to play for as long as it takes for the other to begin to eat before moving on to the next motionless one. Time and time again, I have seen this. I have also been 'the motionless one' helped by 'the helpful one' which has been critical in preparing me for my role in providing the special care required by victims of Australia's Kangaroo massacre.

The only time Kangaroos have been witnessed to demonstrate the 'fight' response is when they have been shot and the Commercial Kangaroo Harvester is cutting their leg to place the hook or cutting off their hands or feet, We have seen them lash out at the 'harvester' and hurt them. An all too frequent sight is the Kangaroo thrashing around, fighting to escape, while hanging upside down from the Commercial Kangaroo Harvester's rack prior to, and during, the time the 'harvester' forces his knife into the throat of the Kangaroo in order to extinguish his life by stabbing his heart without damaging his skin.

Kangaroo mobs that are frequently exposed to shooting are more prone to flight. When this occurs kangaroos experience a number of poor welfare outcomes occur. Specifically Kangaroos can:

- flee towards roads where they may be hit by passing cars,
- can become entangled in fencing,
- mobs can become fragmented, and
- mothers can be separated from their young.

There is pain and distress inflicted on the kangaroos who are not shot. Those kangaroos who have witnessed family members and friends being killed experience and emotional harm that has not been quantified. Furthermore consideration must be given to the impact of killing on mob social structures and protections, as well as the long-term impacts of killing older kangaroos who are essential knowledge holders for the mob.

McLeod and Sharp (2014) authored a report funded by the Rural Industries Research and Development Corporation to investigate the fate of joeys after their mothers were killed and ways to improve young kangaroo welfare. They concluded that maternal separation causes a negative welfare impact for young kangaroos. The short-term response of western grey young-at-foot to both an abrupt and permanent separation from maternal care was correlated with:

- an increased frequency of vocalisations. Vocalisation" in joeys only occurs when joeys are stressed they cough or cry for their mother, increasing vulnerability to predators,

- a marked increase in aggressive acts directed toward the separated young-at-foot, and
- a reduction in the proportion of time spent grooming and playing.¹

18. Can you expand on your submission's assertion that kangaroos butchered in the field risk the creation of zoonotic diseases?

75% of emerging human pathogens originate in wildlife. There is good evidence that high levels of contamination in kangaroo meat for human consumption are being hidden from consumers through the use of lactic acid on kangaroo meat. Studies in Europe found lactic acid detected in all samples from all countries. [Lactic acid can occur naturally in decaying bodies, due to bacterial origin or because it is added to decontaminate the meat. Naturally occurring levels of lactic acid in beef can range from 1.4 to 5 g/kg.² The levels found in kangaroo meat, ranging from 5.5 to 9.5 g/kg, are thus likely to stem from a routine treatment of the meat with lactic acid. The concern is the fact that the routine treatment with lactic acid substitutes good hygienic practices with varying efficacy in actually avoiding contamination]

Numerous epidemics that cause large scale death have been observed in wild kangaroos³, although kangaroo meat is not tested for many human-harming pathogens it could harbour. One demonstrated example is *Toxoplasma Gondii*, which is a recognised long term risk to human health.⁴ The answer to a question posed at the Senate Community Affairs Committee indicates that kangaroo meat is not tested for this pathogen in Australia⁵ and in 2009, a study established a moderate presence of the pathogen among the wild western kangaroo population.⁶

There is no difference in risk of a human pandemic whether the wildlife meat comes from a live market or is slaughtered far away from any scrutiny and then sold in a supermarket. The Covid-19 crisis reminds us that this risk should not be underestimated for any kind of wildlife meat consumption, and particularly in cases where hygiene standards are low, like for kangaroo meat.

As the health of wildlife is intrinsically linked to human endeavours, there is a strong ethical and economic incentive to improve the lives of wildlife, protect the environment, prevent disease outbreaks, and reduce the risk of cross-species transmission. Zoonotic diseases that pass between humans and animals are the leading cause of new diseases in humans. Kangaroos are shot in the wild and are eviscerated in the open where access to potable water and proper sanitation is limited. As wild-caught animals, kangaroos also carry parasites and diseases that threaten human health. These include harmful nematodes such

¹ McLeod and Sharp (2014) Improving the welfare and humaneness of commercially harvested kangaroos. RIRDC

² EFSA (European Food Safety Authority) Scientific Opinion on the evaluation of the safety and efficacy of lactic acid for the removal of microbial surface contamination of beef carcasses, cuts and trimmings (2011). Available at: <https://www.efsa.europa.eu/en/efsajournal/pub/2317>

³ Dror Ben-Ami (2009) A Shot in the Dark - A Report on Kangaroo Harvesting. PP 10-13.. Available at: <https://pdfs.semanticscholar.org/7781/50f03e46d8a6a4532e1a01556761aaf01eb2.pdf>

⁴ Q&A 290, Rural and Regional Affairs and Transport Committee, Answers to Questions on Notice, Supplementary Budget Estimates October 2012, Agriculture, fisheries and Forestry.; (Food Division, Dept Agriculture, Answer to Questions on Notice no 290,no.7, Senate Estimates Oct 2012)

⁵ <https://bit.ly/2QAoGkq>

⁶ Parameswaran et al. Seroprevalence of *Toxoplasma gondii* in wild kangaroos using an ELISA (2009). *Parasitol Int.*; 58(2): 161–165.

as *Globocephaloides trifoldospicularis*, which consumes intestinal mucosa and blood of kangaroos causing mortality⁷. Surprisingly, kangaroo meat is not routinely tested for zoonotic pathogens such as *Toxoplasma gondii* which has been recognised as a serious long-term human health risk and therefore is a high potential risk to retailers selling kangaroo meat products. For example, an outbreak of kangaroo borne toxoplasmosis in humans was recorded.⁸

COVID-19 is an emerging infectious disease (EID) at the animal-human-environment interface. This is a wake-up call for greater consideration of One Health, the interconnected health of animals, humans and the environment. COVID-19 has shone a light on wildlife trade as an anthropogenic driver of EID. Wildlife trade encompasses trade in live animals (for example for consumption and in the pet trade) as well as dead animal parts and derivatives for use as food. Despite the significant risk, there is little systematic monitoring of the movement of animals in wildlife trade or their pathogens. The kangaroo industry is no different.

Zoonotic diseases (originating in animals) and are largely the result of anthropogenic drivers (such as biodiversity loss, climate change, habitat destruction, land use change, intensive farming, diminished ecosystem function and increasing human population density). These anthropogenic drivers can cause stress and altered immune function in animals that may increase zoonotic EID risk.

The Australian guidelines for the processing of kangaroo meat in the field are relaxed compared to game meat guidelines in Europe, Namibia and South Africa where large game meat is either chilled or eviscerated within 4 hours by a licensed butcher. In Australia, carcasses are eviscerated in the field by hunters, without supervision, and then transported in unrefrigerated trucks through the night for up to two hours after sunlight in high summer desert temperatures.

The carcasses are stored in refurbished shipping containers that in some cases not fit for purpose for up to 14 days. In 2018 Salmonella was found in kangaroo meat in the Netherlands and removed from supermarket shelves. Russia banned contaminated kangaroo meat imports in 2009, 2012 and again in 2014. Moreover, an internal NSW food safety review has found multiple chillers to be non-hygienic and contaminated. A paper published in 2008 found salmonella and E.Coli in retail kangaroo meat . In 2009 a paper identified toxoplasmosis as a risk in Western Grey Kangaroos.

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⁷ Fletcher, D. 2006. Population Dynamics of Eastern Grey Kangaroos in Temperate Grasslands. Thesis

⁸ Robson, J.M.B. et al. (1995) A probable foodborne outbreak of toxoplasmosis. Communicable Dis. Intelligence 19, 517–522

and chillers to be non-hygienic and contaminated⁹. A paper published in 2008 found salmonella and E.Coli in retail kangaroo meat¹⁰. In 2009 a paper identified toxoplasmosis as a risk in Western Grey Kangaroos¹¹.

19. Given your mention of the Black Summer bushfires in your submission, can you explain if, how and why the Government responded to the disaster appropriately when considering the management of kangaroos?

WWF working with scientists from the University of Sydney found that over 3 billion animals had been affected from the black summer fires and 5 million of those were kangaroos. After such a massive loss following the fires, the NSW Government relaxed the rules allowing for more non-commercial or unregulated kills.

We believe that the NSW Government failed to appropriately manage the assessment and care of individual Kangaroos, families of Kangaroos and Kangaroo populations in general during and following the Black Summer Bush fires.

Commercial and non commercial killing of Kangaroos continued despite reports of drastically diminished kangaroo populations and the immense suffering and fear of Kangaroos in areas affected by fire. Anecdotal reports from NPWS staff were received stating that where there were once hundreds of Kangaroos seen in National Parks there were no longer any Kangaroos in or around National Parks affected by the fires. Surely the Government's Environment Department representatives, even those who gave evidence to this Parliamentary Inquiry, also heard these reports, perhaps even witnessed the absence of Kangaroos themselves? With such a huge loss of Macropod life, our Government still continued with Kangaroo slaughter business as usual.

The NSW Government's claim that the fires did not impact Commercial Harvest Zones was actually false, see attached map overlaying fire affected areas with Commercial Harvest Zones and Kangaroos Alive's first hand accounts of Commercial Kangaroo Harvesting continuing unabated only a couple of kilometres from the fire front, a Commercial Harvest Zone where approximately 25% of the Zone was impacted by fire destroying....Ha of Kangaroo habitat along with every Kangaroo who lived there

The Government should have called a moratorium on all Kangaroo killing given the scale of the devastation and the depth of suffering it caused to all of NSW's natural inhabitants, including Kangaroos.

It is a fallacy, promoted by advocates of the Kangaroo slaughter, that Kangaroos were able to outrun the fires. The whole world saw confronting images of dead and injured burnt Kangaroos, trapped behind and entangled in fences, taking refuge on the pristine lawns of houses which were saved and those who were eventually rescued from paddocks, their burnt hands and feet festering with infection weeks after the fire incinerated their world. In typical fashion, NSW traded on its iconic Kangaroo, calling for help, funds, exploiting the heartbreaking images of Kangaroos who courageously fought for their lives, all the while hating Kangaroos and gunning them down, in secret, behind the scenes.

Access to fire affected areas to provide assistance to burnt Kangaroos and Kangaroos

⁹ <http://www.smh.com.au/nsw/nsw-kangaroo-meat-fails-basic-hygiene-tests-20150306-13uyft.html>, 7th Mar 2015.

¹⁰ Holds, G., et al. (2008). "Microbial profiles of carcasses and minced meat from kangaroos processed in South Australia." *International Journal of Food Microbiology* **123**(1-2): 88-92.

¹¹ Parameswarana, N., et al. (2009). "Seroprevalence of Toxoplasma gondii in wild kangaroos using an ELISA." *Parasitol International* **58**: 161-165.

without access to food or water was slow and appeared not to be a priority for Government agencies. Long after fires were extinguished, rescuers were still not permitted to undertake search and rescue of Kangaroos and, when they finally were able to enter, the responsibility to help injured Kangaroos, both physical and financial, fell largely to volunteers.

20. How has the changing Code, that you said commercial shooters must abide by, impacted the industry?

The newly revised Code 2019 significantly weakens standards and welfare protections for kangaroos. This includes (but is not limited to):

- reduced standard for accurate shooting with the removal of the requirement that shooters aim for the brain as specified in the 2008 Code and replaced them with the less rigorous requirement of a head shot;
- weakening of protections for female kangaroos and their dependent young with the removal of the direction in the 2008 Code that shooters avoid targeting female kangaroos with obvious dependent pouch young;
- claim that unfurred joeys are not "sentient" and are therefore unable to experience pain to justify allowing shooters to break the neck and/or decapitate young.

With no monitoring at the point of kill the Code and subsequent lack of penalisations for breaches to the Code, there is no incentive for shooters to follow the Code at all.

21. In your experience how easy is it for landholders to get a damage mitigation permit to kill kangaroos and what evidence of damage to grass etc do they have to show?

Landholders requesting permission to kill Kangaroos are not required to provide evidence of damage, either current or relative to prior applications to harm. They are not required to trial or implement non lethal methods of solving their perceived problem prior to being granted authority to kill. They are not required to repair fences or adopt non lethal methods of excluding Kangaroos on completion of their licence to kill Kangaroos, they merely kill all of the Kangaroos then allow other Kangaroos to enter their pastures then kill them too. The landholders' claims to the licencing authority are accepted blindly, an acceptance which is based on generations of misinformation about the presence and purported impact of Kangaroos on Australian agriculture. There is a plentiful supply of research which counters the old school way of thinking such as the fact that one Kangaroo eats an average of one sixtieth of the pasture eaten by one cow, this from the pro killing lobby's own scientists (Grigg, Munz). Kangaroos do not damage fences, cows and sheep do, we have first hand knowledge of this. Is NSW's wholesale massacre of Kangaroos really serving a purpose at all besides causing immense harm, pain, fear to Kangaroos? Are we actually doing the environment, and even farmers, a great disservice by allowing and even promoting the eradication of a keystone environmental engineer, one whose role in seed dispersal and soil health is crucial to the survival of all of Australia's ecosystems? Perhaps it is time to begin to accurately assess the role of the Kangaroo and recognise the benefit to the land, provide accurate information to farmers on the value of retaining Kangaroos on their properties rather than perpetuating the fables from a bygone era which demonize kangaroos.

While it was a simple, unregulated and largely unmonitored process prior to the watering down of protections for Kangaroos by the NSW Government in August 2018, the further weakening of protections and simplification of the application process for a Licence to Harm to merely a telephone call has, no doubt, led to an increase in harm to kangaroos by way of

the number of deaths and the resulting suffering. The NSW Government promotes the involvement of recreational shooters in its slaughter of Kangaroos. DPI runs a programme which matches up recreational shooters with landowners making the killing of kangaroos for fun Government business in a programme established and operated with taxpayer funds.

It is too easy to kill Kangaroos and the killing, the eradication, of Kangaroos is ineffective in exacerbating the damage caused to farmland by native vegetation clearing, poor management and overuse of cropping land, the grazing of introduced animals and our abominable squandering and mismanagement of fresh water.

Our more evolved farmers are beginning to realise this. We have, for far too long, blamed this harmless, indigenous animal for all of our travesties against this Land. It may be time we take an honest look at what we have done and take some responsibility instead of scapegoating Kangaroos and pandering to the farmers whose land 'management' practices have barely changed in 200 years.

22. Can you expand on the concern in your submission that the Sporting Shooters Association of Australia Inc (SSAA) Farmer Assist program is being used by landholders to kill kangaroos?

The concern relates to the use of sports shooters to cull or shoot kangaroos on behalf of landholders. We believe this will increase the number of kangaroos shot for non-commercial purposes. Page 12/13 on the of The Complete SSAA Farmer Assist Program Booklet notes under the heading Use of Dogs "if permission is granted by the landholder or manager, dogs may be used to assist in the location of target animals". We do not believe the use of dogs will result in a good welfare outcome for kangaroos and their dependent young. It will cause a panic with fleeing kangaroos will likely become entangled in fencing or run onto roads. It negatively affects the mob with young separated from their mothers. Although p16 Booklet notes the record keeping requirements there is no mention of how this information is collated and whether it is reported to the NP&WS. This increased availability of non-commercial shooting places extra pressure on kangaroos that are already facing multiple threats.

¹ Fletcher, D. 2006. Population Dynamics of Eastern Grey Kangaroos in Temperate Grasslands. Thesis

¹ Robson, J.M.B. et al. (1995) A probable foodborne outbreak of toxoplasmosis. Communicable Dis. Intelligence 19, 517–522

¹ Van der Merwe, M., P. J. Jooste, and L. C. Hoffman. 2011. Application of European standards for health and quality control of game meat on game ranches in South Africa. South African Veterinary Journal **82**:170-175. Van Schalkwyk, D. L. and L. C. Hoffman. 2010. Guidelines for the Harvesting of Game for Meat Export 2010. Ministry of Environment and Tourism Ministry of Agriculture, Water and Forestry, Namibia.

¹ Anon, 2007. Australian standard for the hygienic production of wild game meat for human consumption. Collingwood, CSIRO.

¹ Stewart, M *Food Safety Issues Affecting Kangaroo Meat Industry* Australian Food Safety News, 5 Dec 2012. <https://www.foodsafety.com.au/2012/12/food-safety-issues-affecting-kangaroo-meat-industry/>

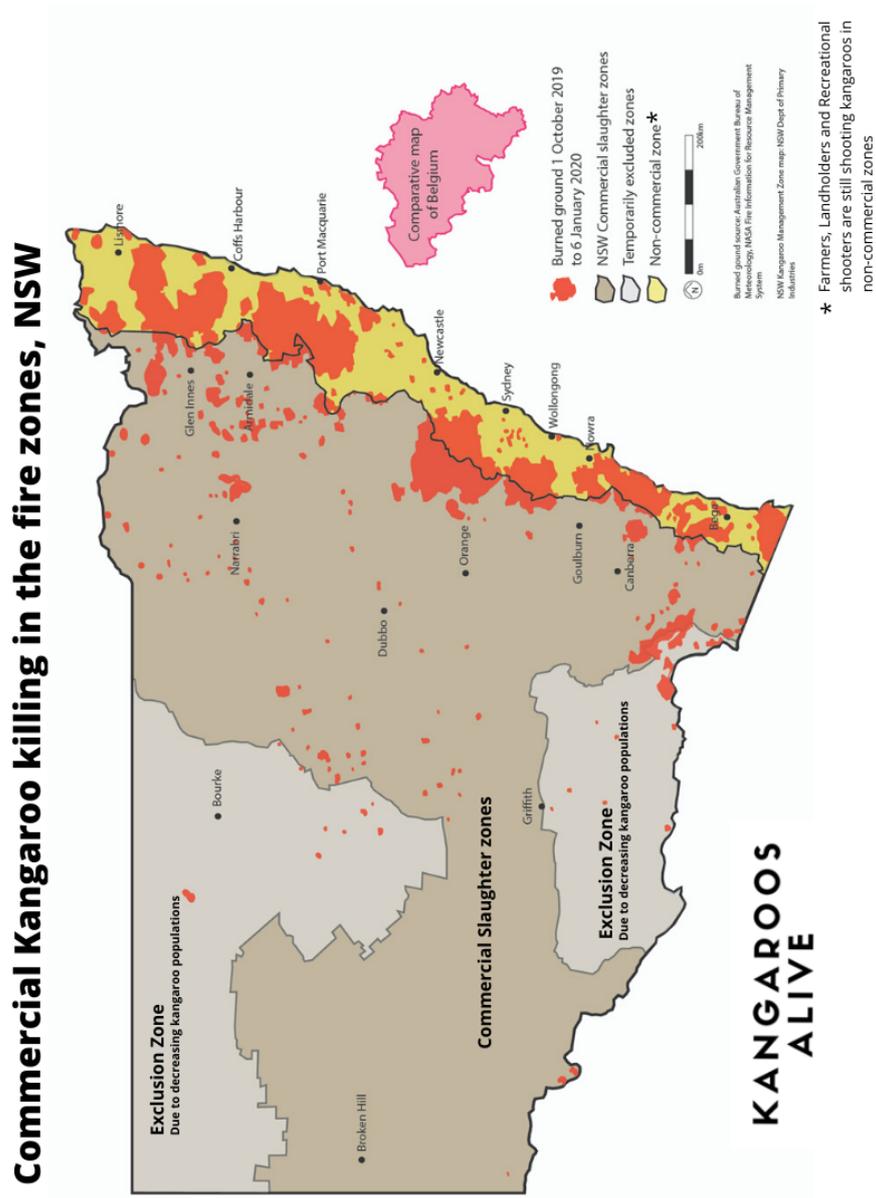
Federal Service for Veterinary and Phytosanitary Surveillance news *The Rosselkhoz nadzor Detained a Kangaroo Meat Consignment of a Questionable Quality* 25 July 2013. http://www.fsvps.ru/fsvps/news/7137.html?_language=en

Tapp, V *Russia bans kangaroo meat due to unacceptable levels of E.coli* ABC Rural News, 19 Aug 2014. <http://www.abc.net.au/news/2014-08-18/kangaroo-meat-ban/5677656>

¹ <http://www.smh.com.au/nsw/nsw-kangaroo-meat-fails-basic-hygiene-tests-20150306-13uyft.html>, 7th Mar 2015.

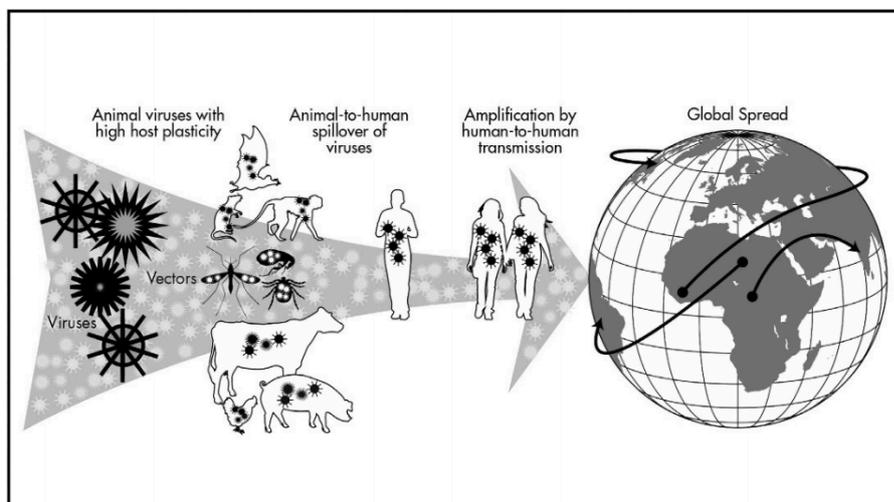
¹ Holds, G., et al. (2008). "Microbial profiles of carcasses and minced meat from kangaroos processed in South Australia." *International Journal of Food Microbiology* **123**(1-2): 88-92.

¹ Parameswarana, N., et al. (2009). "Seroprevalence of *Toxoplasma gondii* in wild kangaroos using an ELISA." *Parasitol International* **58**: 161-165.



Human health concerns linked to kangaroo meat

As the health of wildlife is intrinsically linked to human endeavours, there is a strong ethical and economic incentive to improve the lives of wildlife, protect the environment, prevent disease outbreaks, and reduce the risk of cross-species transmission. Zoonotic diseases that pass between humans and animals are the leading cause of new diseases in humans. Zoonotic diseases from wild animal sources all have trends that are rising sharply upwards¹. The majority of human infectious diseases, especially recently emerging pathogens, originate from animals, and ongoing disease transmission from animals to people presents a significant global health burden². Kreuder Johnson *et al.* 2015 concluded that “viruses with high host plasticity (i.e. taxonomically and ecologically diverse host range) were more likely to amplify viral spillover by secondary human-to-human transmission and have greater geographic spread. Viruses transmitted to humans during practices that facilitate mixing of diverse animal species had significantly higher host plasticity” as outlined in the following diagram. The images at the end of this document show the mixing of different wild species and risk that professional kangaroo shooting poses to human and animal health as well as the world economy.



Kangaroos are shot in the wild and are eviscerated in the open where access to potable water and proper sanitation is limited. As wild-caught animals, kangaroos also carry parasites and diseases that threaten human health. These include harmful nematodes such as *Globocephaloides trífidospicularis*, which consumes intestinal mucosa and blood of kangaroos causing mortality³. Surprisingly, kangaroo meat is not routinely tested for zoonotic pathogens such as *Toxoplasma gondii* which has been recognised as a serious long-term human health risk and therefore is a high potential risk to retailers selling

¹ Bengis RG, Leighton FA, Fischer JR, Artois M, Mörner T, Tate CM. The role of wildlife in emerging and re-emerging zoonoses. *Rev Sci Tech.* 2004 Aug;23(2):497-511. PMID: 15702716.

² Kreuder Johnson, C., Hitchens, P., Smiley Evans, T. *et al.* 2015 Spillover and pandemic properties of zoonotic viruses with high host plasticity. *Sci Rep* 5, 14830 (2015). <https://doi.org/10.1038/srep14830>

³ Fletcher, D. 2006. Population Dynamics of Eastern Grey Kangaroos in Temperate Grasslands. Thesis

kangaroo meat products. For example, kangaroo borne toxoplasmosis in humans has been recorded.⁴

COVID-19 is an emerging infectious disease (EID) at the animal-human-environment interface. This is a wake-up call for greater consideration of One Health, the interconnected health of animals, humans and the environment. COVID-19 has shone a light on wildlife trade as an anthropogenic driver of EID. Wildlife trade encompasses trade in live animals (for example for consumption and in the pet trade) as well as dead animal parts and derivatives for use as food. Despite the significant risk, there is little systematic monitoring of the movement of animals in wildlife trade or their pathogens. The kangaroo industry is no different. A clear contamination pathway is between kangaroo carcasses and if kangaroo carcasses are mixed with other species see images below.

Zoonotic diseases (originating in animals) and are largely the result of anthropogenic drivers (such as biodiversity loss, climate change, habitat destruction, land use change, intensive farming, diminished ecosystem function and increasing human population density). These anthropogenic drivers can cause stress and altered immune function in animals that may increase zoonotic EID risk.

The Australian guidelines for the processing of kangaroo meat in the field are less stringent compared to game meat guidelines in Europe, Namibia and South Africa where large game meat is either chilled or eviscerated within 4 hours by a licensed butcher⁵. In Australia, carcasses are eviscerated in the field by hunters, without supervision, and then transported in unrefrigerated trucks through the night for up to two hours after sunlight in high summer desert temperatures⁶. The carcasses are stored in refurbished shipping containers that in some cases are not fit for purpose for up to 14 days. In 2018 Salmonella was found in kangaroo meat in the Netherlands and removed from supermarket shelves. Russia banned contaminated kangaroo meat imports in 2009, 2012 and again in 2014⁷. Moreover, an internal NSW food safety review has found multiple chillers to be non-hygienic and

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⁵ Van der Merwe, M., P. J. Jooste, and L. C. Hoffman. 2011. Application of European standards for health and quality control of game meat on game ranches in South Africa. *South African Veterinary Journal* 82:170-175. Van Schalkwyk, D. L. and L. C. Hoffman. 2010. Guidelines for the Harvesting of Game for Meat Export 2010. Ministry of Environment and Tourism Ministry of Agriculture, Water and Forestry, Namibia.

⁶ Anon, 2007. Australian standard for the hygienic production of wild game meat for human consumption. Collingwood, CSIRO.

⁷ Stewart, M *Food Safety Issues Affecting Kangaroo Meat Industry* Australian Food Safety News, 5 Dec 2012. <https://www.foodsafety.com.au/2012/12/food-safety-issues-affecting-kangaroo-meat-industry/>

Federal Service for Veterinary and Phytosanitary Surveillance news *The Rosselkhoznadzor Detained a Kangaroo Meat Consignment of a Questionable Quality* 25 July 2013.

http://www.fsvps.ru/fsvps/news/7137.html?_language=en

Tapp, V *Russia bans kangaroo meat due to unacceptable levels of E.coli* ABC Rural News, 19 Aug 2014. <http://www.abc.net.au/news/2014-08-18/kangaroo-meat-ban/5677656>

The Food Standards Australia and New Zealand Food safety management in the meat industry Proposal P1014, Primary Production & Processing Standard for Meat & Meat Products states⁸. contaminated⁹. A paper published in 2008 found salmonella and E.Coli in retail kangaroo meat¹⁰. In 2009 a paper identified toxoplasmosis as a risk in Western Grey Kangaroos¹¹.

For animals slaughtered in the wild (e.g. kangaroo, wild boar), the Australian Standard for the *Hygienic Production of Wild Game Meat for Human Consumption* (AS4464-2007) includes the harvesting of wild game animals and holding of carcasses at field depots¹² within its scope. Harvesting includes the killing of wild game animals, their identification, bleeding, field dressing, cooling, hygienic storage and transport up to the point of their presentation for inspection at a wild game meat processing premises.

The AS4464-2007 requires:

1. the harvesting of wild game animals to only be carried out by a field harvester¹³
2. wild game animals not to be harvested from known areas where the presence of potentially harmful substances such as pesticides, fungicides, heavy metals or poisons could lead to unacceptable levels of such substances in the wild game meat
3. only healthy wild game animals to be harvested
4. wild game animal carcasses to be marked with an approved tag
5. the harvesting and field dressing of a wild game animal is done in a way that reduces the risk of contamination of the wild game animal carcass and its carcass parts and ensures an accurate post-mortem disposition can be applied.

The following are images saved from the Facebook page of S&E Professional Kangaroo Shooting that operate in NSW. No. 5 of the requirement "reduces the risk of contamination of the wild game animal carcass and its carcass parts" is not being followed as evidenced by the images such as no gloves being worn to eviscerate kangaroos and cross contamination between various wild species such as deer and pigs.

The first two images show the unsanitary conditions when kangaroos are eviscerated in the open. The worker is not wearing gloves, and this increases the risk of cross contamination between kangaroo carcasses.

⁸ Food Standards Australia and New Zealand Food
<https://www.google.com/search?q=NSW+food+standards+around+kangaroo+carcass+transport&aq=NSW+food+standards+around+kangaroo+carcass+transport+&aqs=chrome..69i57j33i160.19112j0j7&sourceid=chrome&ie=UTF-8#>

⁹ <http://www.smh.com.au/nsw/nsw-kangaroo-meat-fails-basic-hygiene-tests-20150306-13uyff.html>, 7th Mar 2015.

¹⁰ Holds, G., et al. (2008). "Microbial profiles of carcasses and minced meat from kangaroos processed in South Australia." *International Journal of Food Microbiology* **123**(1-2): 88-92.

¹¹ Parameswarana, N., et al. (2009). "Seroprevalence of *Toxoplasma gondii* in wild kangaroos using an ELISA." *Parasitol International* **58**: 161-165.

¹² This is defined in AS4464-2007 as a depot approved by the controlling authority (or any other authority as required under state or territory legislation) in which wild game animal carcasses are held temporarily under refrigeration, pending transport to a wild game meat processing premises.

¹³ means a person who is given approval by the controlling authority to harvest, conduct harvest inspection, bleeding and field dressing of wild game animal carcasses for human consumption; and is considered by that authority to be competent to conduct those activities.



A worker removes kangaroo legs using what appears to be a Stanley knife with no gloves on.



A kangaroo is eviscerated in the open (its organs removed) and discarded without the use of gloves.



Kangaroos hung up on a customised tray, lying in congealed blood. Indication of the unsanitary conditions of kangaroo evisceration in the field. Many kangaroo carcasses are packed tightly around the carcass of a wild pig that has been shot, creating a transmission pathway for pathogens to spread from between species.



Kangaroo carcasses touching the carcasses of deer that were been shot on the same night. This increases the risk of zoonotic pathogens to spread between carcasses and into the food supply.



S&E Professional Kangaroo Shooting

A dead kangaroo carcass touches a dead carcass of a deer. This can lead to the transfer of pathogens due to mixing animals from multiple sources.