

REPORT ON PROCEEDINGS BEFORE

**PORTFOLIO COMMITTEE NO. 7 - PLANNING AND
ENVIRONMENT**

**HEALTH AND WELLBEING OF KANGAROOS AND OTHER
MACROPODS IN NEW SOUTH WALES**

CORRECTED

At Macquarie Room, Parliament House, Sydney on Tuesday, 15 June 2021

The Committee met at 9:00 am

PRESENT

Ms Cate Faehrmann (Chair)

The Hon. Mark Buttigieg

The Hon. Catherine Cusack

The Hon. Ben Franklin

The Hon. Mark Pearson (Deputy Chair)

The Hon. Penny Sharpe

The CHAIR: Welcome to the second public hearing of the inquiry of Portfolio Committee No. 7 - Planning and Environment into the health and wellbeing of kangaroos and other macropods in New South Wales. The inquiry is examining a range of issues relating to the health and wellbeing of kangaroos and other macropod populations, including indicators of historical trends, the impact on kangaroo populations of commercial and non-commercial killing of kangaroos and threats to their habitat from the impact of climate change, drought, bushfires, land clearing and exclusion fencing. It will also examine government policies and programs related to kangaroo management and whether current practices are in line with biodiversity conservation legislation.

Before I commence I acknowledge the Gadigal people, who are the traditional custodians of this land. I also pay respects to the Elders past, present and emerging of the Eora nation and extend that respect to other Aboriginal people present. Today we will be hearing from a number of stakeholders, including researchers, Aboriginal Elders, concerned individuals, animal welfare organisations, representatives of the kangaroo industry and the New South Wales Government. While we have many witnesses with us in person, some will be appearing via videoconference. I thank everyone for making the time to give evidence to this important inquiry.

Before we commence I will make some brief comments about the procedures for today's hearing. Today's hearing is being broadcast live via the Parliament's website. A transcript of today's hearing will be placed on the Committee's website when it becomes available. In accordance with the broadcasting guidelines, media representatives are reminded that they must take responsibility for what they publish about the Committee's proceedings. While parliamentary privilege applies to witnesses giving evidence today, it does not apply to what witnesses say outside of their evidence at the hearing. I therefore urge witnesses to be careful about comments they may make to the media or to others after they complete their evidence. Committee hearings are not intended to provide a forum for people to make adverse reflections about others under the protection of parliamentary privilege. In that regard, it is important that witnesses focus on the issues raised by the inquiry terms of reference and avoid naming individuals unnecessarily.

All witnesses have a right to procedural fairness according to the procedural fairness resolution adopted by the House in 2018. If witnesses are unable to answer a question today or want more time to respond, they can take a question on notice. Written answers to questions taken on notice are to be provided within 21 days. If witnesses wish to hand up documents they should do so through the Committee staff. In terms of the audibility of the hearing today, I remind both Committee members and witnesses to speak into the microphone. As we have a number of witnesses in person and via videoconference, it may be helpful to identify who questions are directed to and who is speaking. For those with hearing difficulties who are present in the room today, please note that the room is fitted with induction loops compatible with hearing aid systems that have telecoil receivers. Finally, everyone should turn their mobile phones to silent for the duration of the hearing.

DANIEL RAMP, Associate Professor and Research Director, The Think Tank for Kangaroos, affirmed and examined

KEELY BOOM, Research Fellow, The Think Tank for Kangaroos, University of Technology Sydney, before the Committee via videoconference, sworn and examined

DAVID CROFT, Representative, The Think Tank for Kangaroos, before the Committee via videoconference, affirmed and examined

DROR BEN-AMI, Co-Founder, The Think Tank for Kangaroos, and Research Associate, University of Technology, Sydney, before the Committee via videoconference, affirmed and examined

LOUISE BORONYAK, Manager, The Think Tank for Kangaroos, on former oath

The CHAIR: I remind Ms Boronyak that you do not need to be sworn as you have been sworn at the 11 June hearing of this inquiry.

Dr RAMP: I am also the Director of the Centre for Compassionate Conservation at the University of Technology Sydney.

Dr CROFT: I retired from the directorship of the University of New South Wales arid zone research station in far western New South Wales.

The CHAIR: I understand most of you have an opening statement to make. Ms Boronyak, you have another opening statement. Is that correct?

Ms BORONYAK: Yes, just a brief one.

The CHAIR: If everybody could keep them as short as possible, that would be appreciated.

Ms BORONYAK: I will pass over to Dr Ramp first.

Dr RAMP: If we can all say something, we would like to start with David Croft if that is possible.

The CHAIR: You can all say something and you determine the order so that is fine. Let us start with Dr Croft.

Dr CROFT: Thank you for the opportunity to talk. Excuse my casual attire. I live in the Northern Territory and it is 33 degrees today. I started my career in 1976 for the University of New South Wales in terms of research on kangaroos. It is fair to say I did foundational studies on the behaviour of the red kangaroo and the common wallaroo in western New South Wales, the eastern grey kangaroo in Blowering in southern New South Wales and the antilopine wallaroo in the Top End. What I have noted over this long career is a tendency for dogma and exaggeration to enter into the debate about kangaroos. I have recently written a paper, which was published on Saturday, about this issue. Kangaroos are certainly abundant and they are widespread—the four species that you are considering before this Committee. However, what we find is misdirection in terms of this abundance. We find that we get terms of "overabundance", "super abundance" and, most recently, "hyper abundance". We have no celebration of this abundance. There are always too many. There are never enough. If you say there are too few, you are met with howls of derision.

We have attempted to control their abundance with a management program that was born out of concern for their declining abundance. This management program claims to be one which is about sustainability. The only sustainability that it is interested in is the question of how many roos can a roo shooter shoot and still have roos to shoot. It is not about ecological sustainability. What it is about is mining resources from the rangelands. It is the embodied resources in the kangaroo carcasses and skins, taking them to our urban environment or exporting them overseas. It is not about ecological sustainability. In my paper I had a very pessimistic attitude about the future of kangaroo [audio malfunction] salvation in the Indigenous protected areas of northern and western Australia. My colleagues before you today convinced me that there may be an alternative, particularly an opportunity for New South Wales not to go down the rabbit hole that South Australia has gone down in declaring the whole State as a commercial area, except for metropolitan Adelaide.

The CHAIR: I am sorry, Dr Croft, can I just interrupt for a second? We have to get that sentence again. I will keep talking and hope that you can hear me. There is obviously a delay and it is starting to break up. We were getting you okay but the last few sentences you said were breaking up. We are going to get you on the landline so this does not continue to happen. In the meantime, please begin, Dr Ramp.

Dr RAMP: It is a real pleasure to be here and I am grateful to the Committee for hearing us on this important issue. I have been researching kangaroos for over 26 years. I began at the University of Melbourne.

I began studying kangaroos in enclosed populations to try to understand what was going on. I then moved to New South Wales and began studying the impact of roadkill and became aware of this issue of the complacency towards kangaroos within the general community, particularly in relation to roadkill. The research that we did found that the impact of the roads and roadkill on kangaroos was not just on roads but had widespread effects. So it was clear that there was misinformation and complacency around kangaroos. As a co-founder of The Think Tank for Kangaroos [THINKK] at the University of Technology Sydney, we set about trying to create an open discourse around making sure that facts were available to the general public and policymakers around kangaroos. It was clear that many different stakeholders were unwittingly repeating myths about kangaroos—myths that do not stand up to scientific scrutiny.

As you will hear from my colleagues, the commercial kill has a massive toll on kangaroos. My own research has studied the impact on those kangaroos that survive in hunted landscapes. We find that juveniles do not play and there is a loss of relationships between mothers and daughters. These are very strong social creatures that pass down information and have different cultures within every mob, and then they pass them on within each group. You will also hear that each of these different species have different biological and ecological responses to the landscape, so they have survived with different kinds of reproductive strategies. Most of the information that you hear about kangaroos exploding and responding to these boom situations is really unsupported by the scientific facts and the basic biology of the species. That is a pretty clear thing. What we face here is an issue where this inquiry is incredibly timely, because the United Nations has declared its 30 by 30 plan of conserving biodiversity and the only way to do that is coexistence with pastoralists, particularly in the rangelands.

So we need to find strategies to overcome the problems that climate change, rotational grazing and ongoing degradation of these landscapes has made. The kinds of practices that we have used are unsatisfactory or inefficient in recovering these landscapes. Kangaroos, in particular, have been a scapegoat for that. It is really important to recognise that kangaroos contribute very little to total grazing pressure. Total grazing pressure is much more constrained by sheep and goats and cattle. So the notion that ongoing killing of kangaroos is necessary as a necessary management tool to prevent drought and economic hardship for farmers is totally unsupported by the scientific evidence. The continued pushing of this agenda is antithetical to the notion of environmental sustainability and is steeped in colonial constructs of human exceptionalism. The point here is that wildlife are constituents of the land that we share and hence we have a moral duty to find solutions that favour peaceful coexistence. Our recommendation is that this inquiry should establish the formation of an independent committee to identify solutions for that peaceful coexistence.

The CHAIR: Thank you. Ms Boronyak?

Ms BORONYAK: I am going to continue on the theme of coexistence. Coexistence between humans and kangaroos is a challenge in terms of sustainable agriculture, animal welfare, species conservation and ecosystem health and function. Coexistence implies species living together in the same landscape at the same time. It encompasses how people relate to and live alongside wildlife and accept the real and perceived costs, as well as the benefits, of wildlife. Wildlife-friendly farming is a global movement in which wildlife are tolerated and protected in production landscapes. This has been advocated as a model for sustainable farming that better balances agricultural and conservation interests. As public support for welfare continues to grow, there is more support for wildlife-friendly farming that values nonlethal tools and deterrents. I will touch on two examples.

Many graziers already use livestock guardian dogs to protect livestock from dingo predation, yet livestock guardian dogs can also be used as a nonlethal deterrent for kangaroos. Global studies show that livestock guardian dogs are the most effective nonlethal option and a lot more effective than lethal control, yet across New South Wales landholders are not supported to trial and adopt these livestock guardian animals. This is a vitally important pathway to coexistence as it deters kangaroos from a property and negates the need to kill them. I have also spoken to many landholders who are supplementing their income by farmstays in which people can view wildlife, which reduces their reliance on income from grazing and also values our precious wildlife. These examples work with nature rather than against it and are more effective and are more ethical. As a government you need to balance a variety of stakeholder views and wildlife-friendly farming surely does this.

Since the year 2000, 13.2 million kangaroos have been killed commercially in New South Wales—13.2 million. This is the largest killing of terrestrial mammals anywhere on the planet. We have estimated that 3.76 million young kangaroos have been killed when their mums have been shot. Studies also show that an estimated 40 per cent of kangaroos are miss-shot, with shooters directed to bludgeon young joeys to death. The text in the code is by "a concussive blow to the head". This constitutes an animal welfare crisis we can no longer afford to ignore. With more national and international scrutiny on how we treat kangaroos, this mass killing can no longer be tolerated. Dr Dror Ben-Ami will present later an alternative management vision for kangaroos. This would lead to a future that ensures thriving agricultural communities, secure livelihoods, reduced violence towards

animals, multispecies justice and landscapes that are not only productive but support species conservation and coexistence. Thank you very much for your time.

The CHAIR: I understand that we now have Dr Dror Ben-Ami, who has joined us via videoconference. Can you hear me okay?

Dr BEN-AMI: Yes, I can hear you, thank you.

The CHAIR: Okay, great. Just before we go on, I am conscious that the videoconference stream was lagging a bit during Dr Croft's opening statement. Dr Croft, we did not finish a few of your sentences at the end of your opening statement. I wanted to see, firstly, if you wanted to repeat just the last, say, four sentences of your opening statement. You are now on the phone. Dr Croft, can you hear me okay?

Dr CROFT: Yes, I can.

The CHAIR: If you would like to say the last four sentences, I believe you were towards the end of your statement when we lost you.

Dr CROFT: Yes, that is fine.

The CHAIR: Just before you do, Dr Ben-Ami, would you be able to mute your microphone on your computer while you are not talking? Thank you. Dr Croft, go ahead.

Dr CROFT: Thank you for the opportunity to complete my sentences. Basically, what I was saying was that the sustainability of the commercial kangaroo industry or any offtake of kangaroos from an ecological point of view is nonsense. Basically, it is a form of slow mining of the resources from the rangelands and from the agricultural lands; you are taking the embodied resources of those kangaroos and their meat and hides and transferring them to our urban environments and exporting them overseas. As any gardener would know, you need to put something back to take something out if you are going to have a productive environment, and the best we could expect was to get the topsoil from Western Australia and South Australia as it blows over.

I said that I was pessimistic about the future of kangaroos but my colleagues have convinced me that the New South Wales Committee will give a fair hearing to our viewpoints and we offer up an alternative to the current kangaroo management program. I said that I hoped the New South Wales Government would not go down the rabbit hole of the South Australian Government, which has basically declared the whole State a commercial zone except for some small Indigenous protected areas in the north-west of the State and metropolitan ag land, and this includes the addition of species from Kangaroo Island, even though, as we well know, half of Kangaroo Island was burnt. So I can commend my colleagues' views to you and hope you will give them a fair hearing. Thank you.

The CHAIR: Thank you very much, Dr Croft. Just to try and get through the opening statements quickly so we can get to questions, if I can just check, firstly, we have Dr Boom and Dr Ben-Ami, who have not made opening statements. I just wanted to check who out of those—

Ms BORONYAK: Keely Boom is going next.

The CHAIR: Dr Boom, okay. If you could commence your opening statement, thank you, Dr Boom.

Dr BOOM: I will be as quick as I can. Just very briefly, I am not a scientist, but I am a lawyer. I have a PhD in law. I regularly teach animal law. I am an Aboriginal woman and I have publications on the topic of law and policy related to macropods, most recently on environmental law governing whales and kangaroos. As has already been said by my colleagues, this is a very difficult topic; it is not an easy task that faces the Committee. You are discussing the largest commercial kill of land-based wildlife in the world.

There are two issues I want to quickly address that have come up, I believe, on Friday, one of them around enforcement. I understand there were some questions around compliance and enforcement acts of the shooters. The 2020 annual report from the Department of Planning, Industry and Environment does provide some details about enforcement activities. There are some inspections made of harvested vehicles. Harvesters are only checked for their licence and there are no inspections, according to the latest general report, at the point of kill. So we know that the standards are very problematic. As Dr Boronyak has said, they are inadequate in themselves, but there is also not enough—there are no inspections at the point of kill as far as we understand.

This is clearly inadequate and my first position is that I strongly recommend that the commercial and non-commercial killing of kangaroos end on the basis of animal wellbeing and the precautionary principle. But if the industry is to continue, then I would recommend that CCTV cameras are installed to allow monitoring of shooting and then inspections are actually conducted at the point of kill. Obviously we do have raising expectations of animal welfare in our society that need to be met.

The second point I wanted to address was in relation to the killing of kangaroos and other macropods that are starving during drought. I understand that it was suggested that there is an ethical obligation upon us to kill those kangaroos. I would say that there is no basis for that. There are a range of different theories of our ethical obligations to wildlife even if we do have ethical obligations. Obviously there is quite a range of perspectives, whether it is environmental ethics or more of a colonialist perspective, but there is no basis to say that we are required to kill kangaroos or other macropods that are dying due to drought and, in fact, it may cause greater problems because the kangaroos that are most likely to die during drought are going to be the very young, the very old, the diseased or others that have something wrong with them, whereas the shooters are going to be—well, they should be targeting the largest, healthiest animals that are most suitable for the industry. So we are talking about different animals to the ones that would be dying in a drought and the ones that would be killed as part of the commercial industry. So the argument just simply does not make sense.

Finally, I would like to just draw upon this comparison with whales, that I understand did come up on Friday as well. The National Task Force on Whaling in 1997 said that our knowledge of whale stocks and the inherent weaknesses of models developed to predict the effects of exploitative activities on those stocks must lead the world on the need to adopt the precautionary principle and oppose any commercial whaling activity. In Australia, kangaroos and other macropods are our ecosystem engineers and they play a vital role in the integrity of our landscapes. Australia is already a world champion for whales and now it is time for New South Wales to be the champion for kangaroos. Thank you.

The CHAIR: Thank you very much for that. Finally, Dr Ben-Ami, I understand you have an opening statement as well. I think you might still be on mute.

Dr BEN-AMI: All right. Can you hear me well now?

The CHAIR: Yes, we can, thank you.

Dr BEN-AMI: I would like to start by saying that what led me down this path of trying to find an alternative management plan for kangaroos is the ongoing research at the University of New South Wales, where I did my PhD on macropods, which has indicated in research occurring over a period of over 10 years that there is very little direct competition for food and none for water between kangaroos and livestock. And this is not just from my research, but it is Dawson and Ellis, 1994; Edwards et al, 1995; Dawson and Ellis, 1996; and McLeod, 1996—a lot of research showing that there is hardly any competition for resources. So that sort of undermines or negates the underpinning of the kangaroo management plan's existence.

I would also like to submit that my colleagues have shown that there are multiple profound impacts of the current New South Wales management program and in the wellbeing of kangaroos—their ecological integrity and even our very old moral standing of society in terms of the ethics of killing defenceless joeys, collateral damage and many adult kangaroos as well. We are most assured that kangaroos are an inherent and uniquely adapted and completely necessary part of the Australian environment and therefore the current commercially based New South Wales kangaroo management plan also does not address the needs of farmers, pastoralists and crop farmers for two primary reasons: the fluctuations in market demand for kangaroo product and population cycles. The importance of sustainability quotas do not correlate to dry periods when farmers in the arid zones actually need assistance.

The negative public perception of an atrocious welfare record and the hygiene risks from kangaroos that are killed for food is diminishing the demand for kangaroo products. As an example, we see a reduced intake since the Russian ban. As previous testimony has shown to this Committee inquiry, it is also possible that long-term population decreases have eluded detection by the fraught population estimates causing decreased take of kangaroos. The take in kangaroos has dropped by nearly half from 2010 on an annual basis, from three million to 1.8 million. Therefore, we propose that a non-commercial, non-lethal management plan has much greater benefits for both farmers and conservation in New South Wales. New South Wales is the leading State in Australia. The alternative plan will include no killing of kangaroos, increasing the wildlife acceptance capacity of farmers in need and work on evidence-based triggered commercial assistance.

We know from the studies that have occurred in Fowlers Gap in arid New South Wales that competition between livestock and kangaroos occurs at 30 grams of biomass of plant matter per meter squared. When we can measure that biomass level, that is when competition starts and farmers experienced loss of income. Management scenarios include grazers in semi-arid lands receiving compensation for loss of wool productivity and crop farmers receiving fencing installation assistance to keep kangaroos out of crops. Fencing works very well with crops, as research has shown in 1989 and 1990.

The CHAIR: Thank you, Dr Ben-Ami. We do want to get to questions. Could you finish your opening statement as soon as you can, if that is okay?

Dr BEN-AMI: Yes, sure. There are two sentences.

The CHAIR: Excellent.

Dr BEN-AMI: Independent estimates show that the annual cost to graziers and farmers in the arid zone would be \$5.6 million for station fencing and \$4 million for crop damage. This could be further reduced if crop farmers simply fenced their fields and place them 400 metres from forests or farm non-kangaroo-favoured crops. The cost can be partially or fully covered by replacing current funding to the New South Wales kangaroo management plan [KMP]. That is it. Thank you very much.

The CHAIR: Thank you very much for those opening statements, which are very informative. We will now proceed to questions.

The Hon. MARK PEARSON: Thank you, everybody, for coming. The line of questioning I would like to take is that we need to get our head around two different views of the impact of kangaroos on the environment. We are hearing evidence that they are detrimental to the environment, particularly when approaching drought; that they have a particular structure of their teeth where they can eat down the grasses to the very root, and maybe further; and therefore it is argued that they cause drought and they actually have a deleterious effect on the native environment, not just the farming environment. Yet your evidence is that they are absolutely critical to the integrity of the Australian landscape and the integrity of the environment, as they perhaps have been for millions of years. We have these two different views coming towards us. Can you help elucidate what is the case from your research?

Dr RAMP: Thank you for the question. If I can start, as you noted kangaroos have evolved in this landscape for millions of years. For most of that time—

The CHAIR: Just pause again. I remind all witnesses to mute your microphones. We are getting a bit of feedback. It could be yours, Dr Ben-Ami.

Dr RAMP: No problem. Over millions of years kangaroos have coevolved in the landscape as part of biodiversity, and throughout that time primarily they have been driven by resource availability. There have been no large predators predated upon them to regulate them, there was no hunting, there was no fire that really suppressed their populations. We did have a few large-ish predators in the landscape like thylacines, which were about fox size, or Thylacoleo, which is a bit larger. But they did not predate heavily upon kangaroo populations so they were effectively unregulated. They are part of the resources. They eat much less than livestock. Perhaps Dr David Croft can talk in a second on this. They eat much less than livestock. They have very different dentition, as has been noted. It is attuned to—they move on.

What they do is they take some good bits from the plants and they move on. They are not like livestock who are constrained to particular paddocks and left there and they have to keep going and going and going. The research that I have done, for example, around the world of the differences between wildlife grazing and livestock grazing shows that wildlife grazing is far less impactful. The notion that kangaroos are somehow detrimental is just not supported by the scientific facts. It is effectively a myth. I will pass over to Dr Croft, who has done a lot of research in this area around total grazing pressure.

The Hon. MARK PEARSON: Just before we do that, can I add to this question. You make a statement in your submission that there is no known carrying capacity for kangaroos. If that is the case, how do you know their impact on the environment in terms of their carrying capacity for feed and nutrition? If we do not know what the carrying capacity is, how can we debunk any claim that they are damaging the environment?

Dr RAMP: There is an important issue here around what sometimes gets talked about in ecological and environmental terms: this notion of damage and impact. They are not actually things that you can quantify because they are a value judgement. When we eat something or when a herbivore eats something and that thing gets depleted, if you think negatively—you wanted that plant and you did not want it to be browsed and something has gone and eaten it—well, then, it is gone. But that is not damage. That is not impact. That is just herbivory. Herbivory has an essential functional role in maintaining the ecology of these landscapes—the ecology of these ecosystems. They are attuned to herbivory from insects and herbivores and so forth. Just as predators will eat an animal, it all comes down to that value judgement and that is a human thing. When you look at these terms and we look at the role, it is a human judgement. Carrying capacity is very much aligned with that. This notion that there is this static version of what should be this effective carrying capacity in the landscape is not an ecological premise; it is something that is very human.

The Hon. MARK PEARSON: Was somebody else going to go to that question?

The CHAIR: Yes, Dr Croft.

Dr CROFT: Thank you for the opportunity to address that. In terms of the carrying capacity, what we need to recognise is Australia has a very unpredictable climate. The models that have been produced about carrying capacity are a centrifugal model. There is an equilibrium state but it is never really reached because it is perturbed by the unpredictability of the climate. We further perturb this by introducing exotic herbivores into the environment and even if we take one out, we may introduce another, as is happening in western New South Wales. We are taking sheep out and putting goats in, making mixed grazing systems. Grazing systems are very complex. They depend on an interaction between a guild of herbivores. We have destroyed the natural guild of herbivores which existed pre-1788 by these introductions. So you have a system in which too little grazing will lead to an increase in palatable species, which may then lead to uncontrolled fires. If you have too much grazing, you have an increase in unpalatable species and maybe you get too little fire. You have a system that is governed by a guild of herbivores each taking something from that environment, keeping it open pasture which encourages biodiversity.

If you look at the kangaroos, they have a different dentition, as Dr Ramp just told you. They have a different way of foraging. We often hear that they are supposedly ruminant-like. They are not actually ruminant-like. They are more like a horse in terms of their digestion. What you have with sheep, for example, is basically a lawnmower. It goes through the environment—chop, chop, chop, chop. When the catcher is filled, basically they sit down and regurgitate the food and finish the chewing and dissection of the food into small particles. Kangaroos are quite different. They have a long tongue. They have a diastema between their front teeth and their back teeth. They use that long tongue to grasp and clip off the plants. They chew it thoroughly before moving on. It is not like compared to like. If you look at the favourite of rangeland research, which is total grazing pressure, you can calculate that quite easily with the information from the management plans for the kangaroo contribution and the Australian Bureau of Statistics gives you the herd size of sheep and cattle on an annual basis. What you find if you look at the whole of the commercial zones across Australia is kangaroos at most contribute about 5 per cent to 9 per cent of that grazing pressure, sheep contribute 30 per cent and cattle contribute at least 60 per cent.

The Hon. MARK PEARSON: Great. Thank you for that very comprehensive answer.

The CHAIR: Some of the submissions talk about the impact of goats, for example, out in the far west, Dr Croft. Is that the same in terms of the impact of a species like goats compared to kangaroos out west?

Dr CROFT: I think the impact of goats is quite different. Goats are both a browser and a grazer. Kangaroos tend to be strictly grazers, although the western grey kangaroo can take some browse. The problem with goats is they are often introduced because you have relatively unpalatable species, but a goat is not stupid. It basically still eats all the palatable species before it turns to the unpalatable species. They are a serious contributor to degradation of the rangelands.

The CHAIR: We had a discussion on Friday with a number of witnesses about the changing correction factors. I think we had a discussion about that with you, Ms Boronyak. Would anybody care to comment on what they think is going on with this situation in terms of what appear to be over-inflated numbers? Dr Ramp, would you care to comment on that? At the same time, I am particularly interested in the way in which quotas are set.

Dr RAMP: This is not a small area of debate and it is extremely complex. Just to get it out of the way, one of the important issues to realise is this notion of overabundance. As I was saying before around the words "impact" and "damage", overabundance is a human value and a human notion. The late Graham Cawley, one of Australia's greatest conservation scientists, clearly stated that there is no ecological value term around overabundance. We need to put that aside. There is just the number that there are. There is no particular value associated with having too many. That is just not supported by the scientific evidence.

The issue is then around the way in which they are counted and the way in which those quotas are then set. This is something that as a collective we have debated and written about many times in our own research. If we were going to go into the detail of it, we would probably take some hours. We are very happy to actually provide further submissions or further advice on the details that our collective experience can assist with in unravelling or unpicking that. Effectively, there is definitely a problem with the way in which those numbers are inflated to large areas. They take all the land in an entire area and multiply it by how many animals they see via those aerial counts. There are no zeros. Basically kangaroos are just put into every part of the landscape. That is clearly not the case. All the research that we do when we are driving around New South Wales—it is very hard to see kangaroos in some areas. Yes, they are in other areas, but they are not everywhere.

The Hon. MARK PEARSON: NSW Farmers say that when they do the aerial surveys, they do not take into account the number of kangaroos in national parks or protected areas, only other areas. Therefore they think they get a figure of the number of kangaroos which is actually less than the number that are probably in the whole area. What is your comment on that particular finding?

Dr RAMP: Again, a little complex. They do do some transects in national parks, but they traditionally have not. The issue is that there is also this myth that kangaroos can move hundreds of kilometres; they do not. Only the red kangaroo has been known to move—an individual kangaroo has been known to move maybe up to 10 kays and then it will go back to its home range. All the other kangaroos—and we are talking about vastly different species here—have very small home ranges, meaning that they do not travel very much. If, for example, there are kangaroos in national parks, they are not suddenly ending up hundreds of kays away on a farmer's property. That is the first thing to note. The second thing is that with those management zones which are described, there is no pool of kangaroos that are living in those national parks that are then infiltrating into those farm areas. I am not sure exactly where you are going with that question.

The Hon. MARK PEARSON: Would you say their claim is misleading?

Dr RAMP: Absolutely, based on the scientific evidence that we have. Just getting back to the quota issue, one of the issues is that those quotas are then set—not related to necessarily a sustainable yield. We typically talk about a sustainable yield being something where you can be sure that at a population level, intrinsic growth rates would be higher than the take because you cannot take more than what they can potentially grow. I am sure you heard evidence on Friday that clearly states that the reproductive biology of the different kangaroo species is a limitation on those intrinsic rates of growth and that we would typically only expect maximum in good conditions of around 10 per cent. That is still to be worked through, but it is certainly not the 15 per cent to 17 per cent that have been taken.

One of the other issues that is really important for the Committee to understand is that when a shooter goes out to a particular environment—when they set up a chiller in a local area and then the shooter goes out to go and take kangaroos from that area—they do not take the quota. They do not say, "Okay, we are going to take 15 per cent of this mob that we have just come across and leave the rest." They take the whole mob because it contributes to a quota that is at a very large scale. What you are effectively doing is wiping out every individual of those mobs and wiping all of their culture. They pass down all that information. Effectively what is happening and what we have been experiencing and what we have been going out and researching is the extirpation of kangaroos at a very local level ongoing. No doubt, they are seeing kangaroos when they fly those aerial surveys. Yes, there are massive issues with those correction factors because even though they are repeated in scientific literature by scientists and proponents or advocates, particularly government scientists, who are advocates for the ongoing kill, there is no real independent inquiry into just how accurate they are.

The Hon. PENNY SHARPE: Thank you very much for your evidence today. In your submission you talk about the alternative New South Wales kangaroo management plan. You talk about compensation for farmers to allow them to essentially have kangaroos on their land. Who pays for that? When you talk about compensation, where is that raised from or is that just from government?

Ms BORONYAK: Dr Ben-Ami will probably speak to that.

Dr BEN-AMI: The question was about compensation, if I heard correctly.

The Hon. PENNY SHARPE: Where does the compensation come from? Who pays?

Dr BEN-AMI: There are two means of payment. One would be to create some kind of—one would be for the State to pay. As we outlined in our submission, the costs would be less than \$10 million quite easily. What I did not say before was that the competition only occurs in the arid and the semiarid zones and only during drought. Based on long-term records, drought occurs once in 10 years on average over a 50-year period.

The Hon. PENNY SHARPE: Just to be clear, you are saying \$10 million once every 10 years. Is that right? So \$1 million a year over 10 years, essentially?

Dr BEN-AMI: The \$10 million would be the payout on an annual basis, both for crop damage and for fencing damage done on pastoral properties if there is no drought, which is nine years out of 10. This could be even less if farmers create fencing along their properties and then the problem with kangaroos would diminish altogether, cutting the need to funding in the long term to \$5 million a year.

The Hon. PENNY SHARPE: Could I just stop you there? We have had different evidence around exclusion fencing. Are you advocating for exclusion fencing?

Ms BORONYAK: No, not exclusion fencing. You could just have regular fencing, and if farmers planted their crops 300 metres from a forest line, then the kangaroos are unlikely to venture in and eat those crops. So that would be a reduced cost there. You could also plant unpalatable crops in front of your crops, and then the kangaroos would be unlikely to be venturing in and eating those farmers' crops.

Dr RAMP: I guess what we are saying, Penny, is that there are opportunities for coexisting with kangaroos. What we are researching around the world is a big interest in wildlife-friendly farming. We know that it creates sustainability that actually reinvigorates those important ecological relationships and those farms actually produce more as well as being able to get a premium because they are branded in terms of being green because they are not having an impact. There are now wildlife-friendly certifiers around the world promoting that kind of produce and it gets a premium.

The Hon. BEN FRANKLIN: How much would that fencing cost? To do the fencing that you are talking about to exclude kangaroos so that farms are viable, how much would that cost in your estimation?

The CHAIR: I think we will go to you, Dr Ben-Ami.

Dr BEN-AMI: I just did not hear the question.

The Hon. BEN FRANKLIN: The question is: How much would that fencing cost in order to exclude kangaroos so that farming would remain viable under your plan?

Dr BEN-AMI: Per the assessment from the University of Canberra, an independent assessment, fencing costs are about \$5 million a year. That is what it would cost if fencing were to be fixed every year. But, as I said, there could be one-off—well, let us say around \$5 million per the assessment by the University of Canberra.

The Hon. PENNY SHARPE: This is a question for Dr Boom. I was very interested in your comments about how to deal with starving kangaroos. You seem to suggest that there are methods other than euthanising those that are starving. Could you take the Committee through what you mean by that?

Dr BOOM: Thank you for your question. I was not suggesting that there were other methods of dealing with starving kangaroos. The point that I was making was that the kangaroos that are going to be or would be killed for commercial industry are likely to be the healthiest and larger kangaroos, whereas the kangaroos or macropods that are more likely to die from the drought are likely to be very young, very diseased or kangaroos that already have something wrong with them or make them somehow additionally vulnerable to that environmental stress that drought creates. So what I was saying is that there are different kangaroos that would be dying from the drought to the kangaroos that would be killed as part of the commercial industry. If we were saying that we were killing these kangaroos in order to stop their suffering, then the way that the kangaroo industry approaches it is that it is not actually killing those young that would not be—there is no proposal to be killing dependent young and trying to eat them or finding the products to be using from them.

The Hon. PENNY SHARPE: I want to separate this out. Obviously it is clear from all of your evidence that you do not wish to have any commercial harvesting or killing of kangaroos at all. Just to be clear, is that right?

Dr RAMP: Correct.

The Hon. PENNY SHARPE: Yes. I am interested in the animal welfare and your views about the animal welfare issues for starving kangaroos during drought and how they should be best dealt with. Leaving aside the commercial part of it, what is your view about how that is managed? I know that it causes farmers a great deal of distress and they spend a lot of time trying to humanely euthanise kangaroos who they see in distress. Do you support that?

Dr BOOM: I also live in a rural area and I understand that it does create distress when you see wildlife suffering or when anybody sees wildlife suffering that it can create distress. But what I am saying is that, from an environmental perspective, the kangaroos that we may choose to kill may not necessarily be the ones that would die, and so we may be interfering and causing unintended impacts that we do not wish to—

The Hon. PENNY SHARPE: Sorry. I am really not trying to be tricky about this. My interest is in the animal welfare outcomes of animals that are starving during drought and how we manage them. Separate from commercial harvesting or killing for commercial purposes, what is your view about how farmers and other landholders should be dealing with that? Are you suggesting that they should do nothing and just let nature take its course?

Dr RAMP: Can I?

The Hon. PENNY SHARPE: Yes, Dr Ramp, perhaps you can tell us. Thank you.

Dr RAMP: If I may. The issue of how to address mass wild animal welfare is actually philosophically new and actually very unresolved. It is an area of great interest and people are only really starting to address the different ethical and philosophical positions on how you can deal with that. We would strongly acknowledge the distress, as Dr Boom just stated and as you did as well, that when farmers are experiencing livestock dying and trees dying and kangaroos dying and reptiles dying and everything dying, it is a terrible thing. What we are

suggesting—we could provide you with further information about the difficulties around the different ethical positions. There is no single answer.

The Hon. PENNY SHARPE: That is fine. You do not have a single answer for us.

Dr RAMP: No, we do not have a single answer. However, I would say, though, that the arguments we are making around coexistence and sustainability are very much aligned with creating resilience in these landscapes so that those kinds of situations do not happen.

The CHAIR: Okay. I am sorry. We need to move to questions from the Government.

The Hon. BEN FRANKLIN: Can I go back to one of your original points, Dr Ramp, about the fact that there has not been a significant predator of kangaroos, so therefore they run free. The suggestion we have had from other witnesses is in fact that predator was wild dogs, or dingoes, and that now a lot of kangaroos are not being predated on by those wild dogs because of much of the fencing and so forth. That is causing an unnatural rise in kangaroo populations. What would you say to that?

Dr RAMP: Clearly, the first point to make is that obviously dingoes arrived in Australia maybe somewhere between 4,000 or 5,000 years ago, so they have been here a very short period of time. The predators that kangaroos may have had prior to that would have been thylacines or thylacoleos. There is a range of them. But from what we know, the ability of those predators to regulate kangaroo populations was actually incredibly small, mainly because they were solitary and small, or else they were surprise predators, so they would lie in wait, and they were very slow. This notion that kangaroos require some form of top-down control either by humans or by predators to be in balance—I guess is the implication that is being made—is actually not scientifically justifiable.

The Hon. BEN FRANKLIN: That was not the point that I was making. The point that I was making is that there had been this predation, which has now been significantly limited. That is why the population has increased. I understand that dingoes have only been here for 5,000 years, but what we are talking about of course is a balance now. We have got farming now, which we obviously did not have in the way that we have now for longer than the last 200 to 250 years. Obviously there were different methods but we will not go into that debate. My question is: Is it true to say that the dingoes or the wild dogs did, for the first period of that 200 years until the exclusion fencing of wild dogs became much more substantial, have a significant effect on kangaroo populations? Or do you disagree with that contention?

Dr RAMP: No, I would disagree with that. I think that—

The Hon. BEN FRANKLIN: So you say there is no evidence of that?

Dr RAMP: I think there is a little bit of evidence for that, but it is mostly in the arid zone and it relies on studies around the dingo fence and that example is problematic. Where we are studying, we have dingoes and kangaroos and wallabies and they all happily coexist. There definitely would be some level of top-down control. However, the implication that the eradication or the hyper-pressure that we place on dingoes is somehow allowing kangaroo populations to grow to disproportionate levels I think is wrong. The fact is that the landscape in New South Wales has been radically altered to disfavour kangaroos. These are primarily woodland species. They require trees and so forth. They are the environments that they inhabit. As Dr Croft was pointing out, they are primarily grazers, so they eat grass—as opposed to browse. The grass in those woodland environments is what sustained them. This notion that somehow—you hear all the time that the loss of predation, the provision of water, the opening up of the landscape has somehow benefited kangaroos. I can completely say that all of our colleagues here today would disagree with that notion.

The Hon. BEN FRANKLIN: To go back to the vegetation issue, we heard some evidence on Friday from some people with lived experience out in the west who—during the drought there was limited vegetation on the ground—took out their animals, or I should say their farm animals. The kangaroos though did really contribute significantly in terms of stripping that landscape and taking every plant. So that landscape now has not recovered because of the damage that the kangaroos caused. That is just one example of the environmental damage that kangaroos cause, whereas before you were saying that there are herbivory insects and other things. The point that I got was that the damage was much more significant than the way you were contextualising it. I was just wondering if you would like to respond to that.

Dr RAMP: Sure, absolutely. I totally sympathise with those farmers that are engaging in the kinds of practices that have been done since European settlement. What is really clear here is that, particularly in western New South Wales and particularly as climate change is happening, we are finding that the kinds of practices and the loss of topsoil and the continued land clearance of trees is having a major impact on these landscapes. The

context is that this landscape was really, really struggling. To justify why that farmer would then take their own livestock and sell them in the first place, the fact that—

The Hon. BEN FRANKLIN: Well, there was a drought.

Dr RAMP: Right, but the fact that it is a drought for those farmers is not independent of the farming practices that they are engaging with. That is what I am saying. Drought was not something that just happened in the way it manifests now 200 years ago and it is not just down to climate change. It is down to the way in which we are altering the landscape. So we have to take some responsibility for the way in which we are altering that landscape and making it less resilient to those kinds of climate situations. The issue then is that you have got wildlife that are trying to exist in those landscapes. As you heard from the testimony of Dr Croft, all of the science shows that the contribution that kangaroos make to total grazing pressure is actually incredibly small. I totally appreciate that those farmers would see those last bits of grass go, but there is a responsibility of those farmers to acknowledge the role and the fact that that situation was there in the first place. I think we have a duty to try and help. We have a duty to find new ways of farming in sustainable ways that enable wildlife to flourish. The research around the world is showing that that is possible and much better for the environment.

The CHAIR: We do have to leave it there. Thank you very much for appearing today. Thank you Dr Ben-Ami for dialling in, I understand, from Israel. I thank the other witnesses who dialled in.

(The witnesses withdrew.)

(Short adjournment)

MAX DULUMUNMUN HARRISON, Aboriginal Elder, affirmed and examined

RO MUDYIN GODWIN, Aboriginal Educator, before the Committee via teleconference

The CHAIR: Welcome to this public hearing of the inquiry into the health and wellbeing of kangaroos and other macropods in New South Wales. Before starting this session, I again acknowledge the Gadigal people of the Eora nation, who are the traditional custodians of the land on which we meet today. I also acknowledge the lands you are coming from today. I pay my respects to Elders past, present and emerging and extend that respect to other Aboriginal people present. I welcome our next witnesses, Uncle Max Dulumunmun and Auntie Ro Mudyin Godwin. Auntie Ro is joining us on the phone, so the Committee will take her evidence unsworn. Auntie Ro, would you like to start by making your opening statement first? Please take the time you need.

Auntie RO GODWIN: Thank you so much. Good morning, everyone, and thank you for taking the time to chair this vitally important inquiry. For the first time, those of us who have been negatively and severely impacted by the relentless colonialism surrounding kangaroos and the barbaric slaughter of sacred totem kangaroo now have a voice. In the pointed words of Mr David Brooks, honorary associate professor in Australian literature at the University of Sydney, in the article "Re-thinking kangaroos: The ethics of the slaughter of a species" published by ABC Religion & Ethics on Monday 7 June 2021:

It is no longer as widely acceptable as it was to regard non-human animals as unthinking, unfeeling, unsuffering commodities. ... There seems at last to be a growing understanding that, when we slaughter, we slaughter beings *like ourselves*.

I would like everyone to think about that as we yarn here together today. I am Auntie Ro Mudyin Godwin, Palawa woman, Indigenous educator and writer. I am just one of many Indigenous people whose lives have been almost destroyed thanks to the distress caused by the Australian and New South Wales government sanctioned commercial kangaroo killing industry. The treatment of country and kangaroo by the unsustainable farming sector and by the colonialism that infects the minority of the people causes the majority of the destruction across country. It is colonialism that sees country as only something to gain a financial profit from—to be used, to be abused—and that sees kangaroos as a pest. It is used on a daily basis as a tool to try to justify the unabated slaughter of sacred totem kangaroo and the ongoing destruction of country.

The kangaroo is my family totem. A totem is a natural object, plant or animal that is inherited by a clan, individual or family as a spiritual emblem. We have caretaking and conservation responsibilities for our totems. Totem defines people's roles and responsibilities, our relationships with each other and creation. The kangaroo are my ancestors. They are my culture and my family's spiritual connection to country. Every time one of these totemic animals is gunned down a part of myself—my family—dies. Our cultural connections die. The interconnectedness of country dies, our creative spirit torn apart. Indeed, I wonder if that is seen as a treasured bonus in the eyes of the colonial killer. To see the very government that governs this stolen land under the coat of arms, the kangaroo and the emu, profit from the commercial slaughter of kangaroos like some sort of trophy exemplifies blatant and obnoxious colonialism.

I have chosen to appear before you via audio link today as I now fear for my personal safety as a result of being a very vocal Indigenous woman and a truth teller, speaking out and condemning the abhorrent commercial kangaroo killing industry—and indeed speaking out against the unsustainable farming sector, which continues to cause so much destruction to not just kangaroos but increasingly all wildlife and ever-increasing areas of country. Clearly, from the death threats I have received over the years, the aforementioned are worried about the truths that I speak. As long as sacred totem kangaroo are slaughtered, gunned down and treated as garbage I will never be silent and I will never be silenced. The wording in the death threats again shows the poisonous infection of colonialism.

It was not enough that the invaders of this once-pristine country mass-slaughtered Indigenous peoples—my family, my ancestors. It was not enough that they took body parts of Indigenous peoples, our tools, our artwork and the bones of those they slaughtered to the other side of the world as trophies. No, that was not enough. It is never enough as that behaviour pattern, that mindset, continues today. No lessons have been learned. In fact that very mindset and those behaviours repeat themselves ad nauseam and without any care, daily, via the behaviours of the government-sanctioned commercial kangaroo killing industry. These sacred totem animals, their spirits are never able to rest as they are gunned down. Their flesh and body parts are taken, cut up, shipped around the world and taken again. Their internal organs, their heads, are severed and tossed aside like garbage as they are killed. If kangaroo joeys are not legally bludgeoned to death by shooters those surviving little babies—little joeys—will ultimately die lingering deaths alone as they call to their slaughtered mothers. A lucky few will find their way to the arms of wildlife rescue, and we are so thankful for them.

Not only are kangaroos gunned down but they are poisoned, run down, run over or herded against exclusion fencing and gunned down for fun—no respect for these ancient ones, no care. Indeed, I recall a farmer

in the unsustainable farming sector who laughed as he spoke about a kangaroo caught in a section of his exclusion fence. Carrying around the bloodied mess, hanging by her broken feet, he laughed about it as she in terror fought for her life—to which the farmer responded, "Who cares, mate? They're a bloody pest." He left her to die a lingering death in terror and agony. The hypocrisy of those calling kangaroo a pest is breathtaking.

I have been honoured to have recently contributed to the book titled *Injustice* by documentary journalist Maria Taylor. From that book I quote the following extract from the yarnning between Maria Taylor and Indigenous Elder, wood carver and artist Billy Doolan:

In the old ways, he says, "we danced the trails, waterholes, animals. We were part of nature." Not separate as a dominator, I understand from this statement. "We walked with the animals. We are true children of the earth; it provided what we need. This place was virtually untouched when Captain Cook came. Animals were the ones that did all this," he tells me. He mentions the soil-enriching worms, insects that pollinate, eels that clean the rivers, and marsupial grazers with their soft feet unlike the hard-hooved animals that came with the invasion. "That's why we had the beautiful grasslands."

...

"It's the native animals, they keep the system going."

Billy continues:

There is hope if people make changes to heal the land and live with the native species. Mother Earth can heal herself if we help.

And then somewhat of a warning from Billy, which indeed continues to be ignored:

If people keep doing what they do, things are going to be very bad. ... Everybody is responsible to look after this beautiful country.

I wonder how much longer it will take for the veil of colonialism to lift, given the ongoing behaviours of destruction. How much longer do we have until everything is gone? These sacred totem animals—this kangaroo—encompass the evolutionary, ecological and cultural processes that sustain all life and all culture. The slaughter of kangaroos must stop. The colonialism must stop. Enough damage has already been done, but sadly not enough damage has been done to satisfy some.

The CHAIR: Thank you very much, Aunty Ro, for that very powerful opening statement. Now we will move to Uncle Max.

Uncle MAX HARRISON: The kangaroo preceded our Indigenous culture more than 80,000 years ago and deserves both the land and living rights above all other introduced species, the right to live without cruelty and exploitation. Native animals, birds and reptiles have the highest respect in our cultural totemic system. The kangaroo is an Australian icon adopted by the Australian government and is shown on shields, coins, emblems and Parliament House itself—along with official letterheads and other paraphernalia—yet it appears on the brink of becoming an endangered species.

This powerful, soft-footed animal that shares our nation with us has been relegated last, replaced by the hard-hooved introduced animal species, creating displacement and desecration. Inside cultural practice, we only took whatever was needed for food and medicine. We never harvested meat or medicine for profit. It is not spiritual practice to kill our iconic animals for \$80 million per annum. It was not an industry that drove the hunt. It was our ceremonial practice for food and medicine, and still is today. There are other little bits there, but I will just leave it at that point. I think that I do not know Aunty Ro, but I was so proud to hear her talk.

The CHAIR: Thank you, Uncle Max. We will proceed to questions now. We have members here from the Government, the Opposition, The Greens and Animal Justice Party. We will go to questions first from the Hon. Ben Franklin for the Government.

The Hon. BEN FRANKLIN: Thank you both for being here and for your testimony today. It is a very important perspective, I think, for this Committee to hear from Indigenous First Nation voices, so thank you very much for that. I have just got one question, and I would be interested in both of your perspectives: Do you think that there are Indigenous kangaroo management practices that the Government can learn from to incorporate better into government management—things that First Nation people do and have done for many, many years that the Government can incorporate into what we do in terms of managing kangaroos?

The CHAIR: We will start with you, Uncle Max, if that is okay.

Uncle MAX HARRISON: Look, that is a big question just to throw at me now, you know; but, yes, there is. And I need to get back and sit down with all my young men and talk with them. I have got to go back to Dreamtime. You see, my Dreamtime is my history. My Dreamtime is what we do about our animals. As I am talking to each young man and older men, I am talking to them mainly about their totems, their totemic systems, and I am coming up with a lot of cross-totems with a lot of them in, and it is moving in and out of the kangaroos. Even as they are driving out as they are going out to camp, they are talking about—they will say, "Uncle, did you

see that poor fella there, hanging on the fence?" or, "Did you see him on the side of the road?" We had to stop and pick him up and bring him off and bury him—give him a decent send-off.

Do not think this is not happening today. They are doing this while they are driving a motor car. They are doing this while they are coming out to lore with me, to sit with me for 10 days. They are doing this kind of thing. They are still in practice of looking after their iconic animals, even if some of them have not got that animal as a totem. It is to respect lore how these old fellas—I am talking about the kangaroo here—has helped our people in survival for 80,000 years and upwards or longer than that, you think. We have to respect them. My thing about the shooters, it is how they are doing it. I do not know if you have looked at the film *Kangaroo*. That is something. That is an eye-opener. Just have a look. It is why we are angry about that.

You know, if I walked into St Vincent's Hospital or this hospital next door to you and I grabbed a little newborn baby—I am going to put it to you hard and rough here—and I walked in and grabbed those little kids and bashed their heads in and said, "There are too many of youse." Where would I end up? What would happen to me? But it is not about me. I am talking about an animal here—an animal. It cannot go anywhere at times because of fences and the fences are diverting the animal. Then they go through in masses and then all of a sudden they become a pest. You know, apparently some of you must live in the country. You live on the country, but do you live with the country? That is the point I am trying to make here—not only just live on country, but live with it.

This is what I have been doing for 85 years. I have tried to protect our icons. You see, and again, as I said, it is not how they are shooting them and killing them but it is the little ones—the little ones that are suffering. We have a woman that we have got down the South Coast who has got a little sanctuary and the sanctuary is of kangaroos, free kangaroos. They are not fenced in but they come there. They come to this woman's place for refuge. And this can happen. These are the things that should be done. You know, when you are driving through the outback you will see signs, you know, "cattle", "sheep", but holy hell, you do not see a sign about kangaroos and emus and wombats. I am just sick and tired. I am sick and tired of a fight. I am sick and tired of having to come and defend these iconic animals and to be here questioned like this.

What if I had broken the law? It is not me breaking the law. You people are the law-holders. Change it! For Christ's sake, change it! Make a difference and you will not have this them and us. You see, we have animals. If you go into the zoo over there and you slaughter them, what would you be? How would you feel? How would the people feel about you then? And we call those animals "dumb animals". For goodness' sake, they have been here before us. They have been here before you. So where is the passage of right for these iconic animals? Why does questioning and letter writing have to happen? Just take a look at the film. That is all I ask you to do.

The action is speaking for itself. Hear the farmers down there talking about how the kangaroos are a pest. They are cutting all of the grass up and he is standing among sheep—throwing up the bloody dust all around him. There are things like that and they are making those statements. I do not know what this Committee is going to do about this but what does it do? What does it do against defencelessness? What will it do against defencelessness? Have you got any friends that have property with sheep, cattle and horses? There are things that are going away from the Snowy Mountains where we are trying to stop the horses that are cutting the rivers off. Nothing has been done about that. These hard-hoofed introduced species are doing more damage—the cattle, sheep, goats, pigs and horses. I guess there will be an inquiry on that and by that time the rivers will be cut because they are blocking. They are turning the taps off great rivers.

The CHAIR: Thank you, Uncle Max, for those words and for that contribution. Please rest assured that all of us are taking your words and wisdom very seriously. We have a report to make. You wanted to know what we are doing with this information. We have to make recommendations to Government. As I said, the people here are not just the Government. We are from a range of different parties and we are all looking at this issue with concern and with the seriousness that it deserves. We are very thankful and grateful that you are able to make it here today. We will continue with our questions. I just wanted to see whether Aunty Ro had any contribution to make at this stage?

Aunty RO GODWIN: I just wanted to quickly say on this whole use of the word "management"—kangaroos do not need to be managed. They never have needed to be managed and they never will need to be managed. Right there in that question that was asked we see that strain of colonialism coming through. The commercial kangaroo killing industry flies in the face of Indigenous culture. Traditional hunting was done, as Uncle Max said, on a survival basis. The commercial industry is a profit-driven industry. If the Government needs to adopt anything it is: Just stop killing them. We have had enough of the destruction. We have had enough of the distress being caused. We have had enough of culture being destroyed. Just stop it. Stop doing it. There is no need for a commercial kangaroo killing industry. There is no need. It is being done for greed and profit.

The CHAIR: Thank you, Aunty Ro. I will say as well—which I neglected to say at the beginning—we do have a member of the Government, Catherine Cusack, who is dialling in via videoconference as well today. Ms Cusack has a question that she would like to ask now.

The Hon. CATHERINE CUSACK: Thank you very much. My question relates to the impact of hoofed animals in arid landscapes—the impact that that has had on food resources for all animals, native and otherwise.

The CHAIR: I think we will go to you again, Uncle Max, because you were talking about that with the feral horses. Did you hear the question?

Uncle MAX HARRISON: Not quite. Could I have that question again please?

The CHAIR: I can say it if you like. It was essentially about the damage that hoofed animals have particularly on the arid environment and how this impacts on the food resources for all animals.

Uncle MAX HARRISON: God love me. We have carriers and we have birds that come and pick up seeds, and that does the plantations in other parts. All of the hard-hoofed animals are just pressing that down. Whatever birds—you are passing the old animal environment. Once you start separating animals with wallabies, kangaroos and horses, cows and sheep—you talk about the environment. That word is not our word. It was introduced again. That word "environment" is about everything—grasses. Birds pick up those seeds. Then, if they drop them, they are plantations of other things. They do that. They know that. They are our gardeners also. We have different little gardeners and people do not realise it. You have got to look at nature, understand nature and live with it, whatever that word "nature" is. I am using it now but do we abuse it? That looks like what has been done. Nature has been abused and that includes the animals—the soft-footed animals who can carry grasses and drop them out of their paws. Hard-hoofed animals press it down. They are doing the gardening for us with grasses and all of this kind of stuff. That is why they went across the Blue Mountains and they saw the green pastures. They did not have to do it here around the Sydney Basin. It was still untouched; it was virgin. But out there was just about the same.

Nature is the greatest teacher of all and people have got to understand that. Nature is the greatest teacher of all. This is how animals were back in them old days, when the old fella sat me down—my grandfather sat me down in a classroom. My classroom was a tree. My classroom was a bush. There I sat while he taught me because I was not allowed to go to school. So I had to learn about nature. He said to me, "Nature is the greatest teacher of all. It can speak to us without voice." I got up and I walked away from my old grandfather and I thought, "This old fella is going gwani. Was he hit with a boondi too often?" No. He taught me some of the greatest lessons about nature, about the grasses and about the plant life. As I said, the hard-hoofed animals will press it. I do not know if anyone has seen the film that we have done up at the head of the Murrumbidgee—one of our greatest rivers. God love me. It is a boghole—by the hard-hoofed animals. We asked for that. Nothing has happened. They did not do an inquiry about that. When is there going to be a decent inquiry about all of these hard-hoofed animals? Where are you going to put them if you want water?

The Hon. MARK PEARSON: Thank you very much for coming, both of you, and for your extraordinary opening statements and answers so far. We have been given evidence and claims that the commercial kangaroo industry actually offers employment to Indigenous people.

Uncle MAX HARRISON: To shut them up.

The Hon. MARK PEARSON: What is your view about that?

Uncle MAX HARRISON: It shuts them down. It keeps them quiet. Is that what the employment is?

The Hon. MARK PEARSON: The claim is that First Nations people have jobs either in the processing plants—either driving carcasses to processing plants or killing them as a shooter. What is your view, both of you, on that claim that it is important to the Indigenous communities to have these jobs?

The CHAIR: We will go to Uncle Max. Did you want to respond first? Then will go to Aunty Ro.

Uncle MAX HARRISON: Look, that is another mission manager's job. That is what the mission manager did back in the forties, thirties and fifties—show our people how to do things and being told by the manager. I worked for rations—10 pounds of flour for every fortnight—and I still see this method happening now. You just spoke about it. You have got this enticement there and again the enticement is the money part of it. And the people—most of those fellas that will do that are going to be the fellas out on the plains country, on the flat country. They will be running at that because there is no—all that surrounds them is sheep stations and cattle stations for miles around them. So they will take something different. Take it or your dole is cut off. There is always a thing there that is going to dangle for our people to go into something that they do not like doing.

The CHAIR: Thank you. Aunty Ro, did you care to comment on that as well?

Aunty RO GODWIN: I absolutely agree with Uncle Max and I will say this: In my view, no true Aboriginal person would ever be involved in such a barbaric industry that brings so much distress and destruction upon culture, country, animals and indeed those of us who hold kangaroos totem. I refer to these people as being whitewashed, as Uncle Max has outlined there. There could be, if we had forward-thinking governments, plenty of job opportunities so these people will become involved in showing and teaching how to coexist. You must coexist. If we are to move forward in any way, shape or form we have got to coexist. This has got to stop. This slaughter has got to stop. It flies in the face of Indigenous culture. It is a profit-driven industry and it just has to stop.

The CHAIR: Aunty Ro, in your opening statement you talked about the kangaroo being your family totem. Could you expand more for the Committee around the impact of having your family totem killed in the way in which kangaroos are being killed in this country? I know you talked about it briefly in your opening statement but explain more the totem in terms of significance to your family and then the impact of seeing your totem treated the way in which kangaroos are treated.

Aunty RO GODWIN: Totem—okay. It varies from clan to clan, obviously. It is not one blanket definition.

Uncle MAX HARRISON: Yes.

Aunty RO GODWIN: In regards to myself, I was taught at a very young age about the creator spirit being the kangaroo. I am Palawa. I was taught that this kangaroo moved across Tasmania and created river systems, mountains and the country which we see. They are my ancestors. If I did not have kangaroo, then I would not have ancestors. They are my creator spirit. I think the distress comes when—and I am just trying to think how I can put it in to sort of a white perspective. Basically it is like having your entire family gunned down every night—and extended family gunned down every night—and their bodies dissected, butchered, cut up, sold off, taken overseas and dressed up as a commodity for profit. It causes immense distress because our future generations—my nieces, my nephews. I want to be able to take them out on country and say, "Look here. This was created by the kangaroo. This valley here, these rivers, these creeks—all this area, created by the kangaroo." Every time these animals bound across the country, all the vibrations from the thudding of their feet and their tails—sending vibrations out, regenerating. When these animals are taken and slaughtered then a part of us is missing. I cannot do that anymore.

Right now where I am, I am taking kids out on country and there is nothing there. It is like a big dead zone. It is almost like a zoo—there are only the animals there that whitefellas want to be there. And only in the numbers that they want to be there. So how do I then teach my kids—and this is a question for you fellas. How do I teach the future generations about a strong connection to country? How do I teach them about how kangaroos are a part of us, are part of our very being, a part of our spiritual connection to everything? How do I teach them that when there is nothing there that I can show them to teach with? How do I do that? And I think that is a question that you fellas need to answer. If this slaughter continues and it gets to a point where there is nothing left—and we are getting pretty close to it despite what the Government says and all their overpopulation and all this carry-on. We know it is all a farce. That is all being done just to run a profit-driven industry.

In actuality, I am going out there standing on country with kids, looking out, and I cannot see anything. There is nothing there anymore and I am so overwhelmed and distressed by what I do not see that it has led to me being suicidal at times. Why am I made to feel like that? Why? Because of the behaviours of a few. Because of the greedy take and the greedy want of a few. You fellas have got to stop. You have got to stop. Our future generations depend on this animal to regenerate country, to provide interconnectedness of country. Our future generations need to learn about their culture, how they belong to this land and how we all belong to this land together.

The CHAIR: Thank you, Aunty Ro. Uncle Max, I will go to you in a minute in relation to totems as well. But I also wanted to ask you, Aunty Ro—you mentioned that it is like having your family gunned down and you mentioned how stressful that is. In other words, the stress that this imposes on your people is extreme. To see this happen is leading to increased, I assume, stress, mental health issues and sickness. Is that fair to assume? I am sorry if that question sounds slightly flippant or—

Aunty RO GODWIN: No, no.

The CHAIR: Would you like to talk about that more?

Aunty RO GODWIN: Do not assume it because it is happening. There is no assumption there; it is happening. My mother will not even talk about it anymore, she is so distressed by the whole thing. When I was five years old she began rescuing joeys; we are talking 45, 46 years ago now. These joeys—I remember saying to my mum, "Where are all these little animals coming from? They do not just fall out of the sky." Then she told me

about how whitefellas were going out killing all these kangaroos and these little babies that we had in care before wildlife rescue was a thing—these orphaned little children. From that age I understood what was happening, and from that age—a very young age—I became distressed because I could not understand how somebody who, for all intents and purposes, is introduced to this country would then pick up arms and go out and gun down those who belong here, who have been here for thousands of years. I could not understand that as a child. I still cannot understand that as an adult.

I got to a point where I was feeling so overwhelmed—nobody was listening, I always put my hand up, sent emails, ring politicians, yarn to Elders, "Come on, you've got to stand up." They do not want to get involved. They cannot even get their head around the extent of the slaughter, let alone try to get involved in it. They just cannot understand, like I cannot understand to the point where just over six months ago I found myself wandering up to the local highway, wanting to stand in the middle of the highway—a four-lane highway. I had had enough. In exposing this blood industry, I have had to look at the most distressing photos, watch unbelievably cruel videos of shooters laughing, stomping on the heads of joeys, laughing and calling, "Here you are, you black coon, have a look at this, eh? Have a look at this, you black coon!" What is that? I cannot respond to that, and when I do I get death threats. Where I live is surrounded by CCTV cameras. I very rarely go out alone anymore. I have always got to have someone with me. What is that? Does anyone ever stop to think about that while everyone is running around gunning down all these animals, "Oh, they're a pest. Let's whack up a little bit more exclusion fencing"?

There are very, very wide-impacting ramifications from all this. And some people simply just cannot cope. It has been going on for so long, first with our Indigenous people, gunned down. All that was talked about before, and it is still going. It is almost like a trophy, "Here you are, look at this, eh. Look at this!" All these carcasses hanging off the back of a truck. And then they post photos on Facebook of truckloads of these animals—no heads, no forearms, no tails, just bloody matted mess atop bloody trays—of blokes jumping around and all these little laugh emojis and all this carry-on in response. You just have to stop and think about what is happening and how it is impacting us. The only reason I got talked out of walking on that highway was because the people who got me back from there reminded me that I do not need to impact other people's lives; this is selfish. And it is in a way because I do not want to impact other people's lives by taking my own. I had to take a step back and really look at how I can keep going and keep fighting and look after myself mentally.

So, I think it is a very real and very ongoing problem that is not often spoken about, and I think for wildlife rescue carers as well. These people are dedicating their lives to saving these animals, and it is unbelievable that they even have to do that. Why do they have to do that? It is unbelievable that we are sitting here at this inquiry having to talk about this, having to rally a government, chat to a government, to stop this killing. It is 2021, not 1788. It has got to stop. More people are going to die, and more people are going to die feeling hopeless, feeling disconnected. Is that what everyone wants from this industry? Take away the kangaroo, destroy the culture and continue to destroy Aboriginal people?

The CHAIR: Thank you, Aunty Ro, for that very powerful statement. I am not sure you can see us, being on the phone, but everybody is incredibly moved by your words. We only have about five minutes left of this session. Uncle Max, would you like to comment on anything? I asked the question in relation to the family totem, but I invite you to say whatever you would like to say to us.

Uncle MAX HARRISON: Different families, different nations within this country you call Australia have different totems. In those nations are all the tribal mobs. All those tribal mobs, they become a community. Each and every one of that family has had a totem. Some kids have one or two totems, and usually the parents hand them that totem down, and mostly I am looking at a lot of that now. There are a lot of kangaroos being passed down and given as totems within the family. I myself, when I am doing my cultural lore, all of them that I will give, I will always include five to six kangaroo totems and different other totems. We have to look at all these. So, all your tribal groups then have a right, if they could remember their responsibilities of looking after the particular totems that they are given, then they are the ones that will jump up in arms if that totem is being decimated, not being treated well. You see?

There are lots of the mobs with the kangaroo totem, and they hold that. They look at it and if someone else has eaten that kangaroo, they will say, "Dear brother, don't eat that near me," or "Wait until I get out of your road." You see? The respect that we have for that iconic animal is pretty huge, it is pretty big. All the groups are starting to identify a lot of their totems, so I keep saying to them, "Don't forget the little fellows." The little fellows, when I am saying that, is also your birdlife and lizards, snakes and that and whatever. So every time I take men out to camp, I give them a totem. There is always the kangaroo that is included in my handing down of the totems. A lot of our mob—some of them might not recognise their totems or do not know their totem because of the Stolen Generation, when their parents were taken away. The parents that were taken away, or most of them, are all grannies now—grandmothers and grandfathers, you know? So they never had a time to even think about handing their totems down. But they have their spiritual connectedness. I have got to keep going back to their spiritual

connectedness with land, animals, water and trees. That is very important in the totemic thing in looking after the totems.

I myself am another sacred one, which is out on the ocean. I am not on land, I am on the ocean and I am sharing my knowledge there of Gurruwul the whale. Gurruwul the whale was given to me at a late age. In 1947 I was told a story about Gurruwul the whale. I held that story for 70 years. I talked about it but I never done anything about it to go and find the actual story, where it was. I was told to go to a place called Tasmania. I did not have a clue at the age of 11 in 1947 to go to wherever Tasmania was. It was not until five years ago that I went down there and I found the remains of the story engraved in stone. My grandfather and these uncles told me to go there to look for one of my totems' story, and that was Gurruwul the whale

Here I am; tomorrow until Sunday I will be out on gadoo—the ocean—talking and telling people, "I'm telling the story on water about one of my totems." You have got to really think about Aboriginal people when they are saying that this is their totem and that is their totem. If you start to think in any of this, "Holy hell, that's a lot of totems," that's a lot of years handed down and memory of what we are told. It is that genealogy memory, if it can be brought back—this is what I am trying to do with my mob, is bring that genealogy memory back to them so that they can understand their totemic system. I share that with non-Indigenous people to make them realise what animals and how important they are to us as peoples, to give them a better understanding of looking after that animal and helping us as Indigenous people to maintain the livelihood of those animals.

You see, totems are not just something you put up as a trophy on your wall. Totems are a thing that you think about, sleep with, eat with and live with, and yet here I am giving evidence about a totem that has been desecrated by greed, not need. We can kill them, we kill them for meat, but there is always a ceremony—always a ceremony. The only ceremony of killing them today is the pull of a trigger, the sound of a rifle. That is the only ceremony. It is so important, folks, if you can understand me and Aunty. I have never met that auntie yet but I would love to meet her, so thanks for bringing us together through communication. That is one thing I can thank this Parliament for, is for bringing me in touch with another person who is fighting for the rights of our totems. Thank you.

The CHAIR: Thank you, Uncle Max and Aunty Ro. Please be assured that your evidence today and your words have been very significant for this inquiry. You have been heard. Your words have had a very big impact on me and I am sure on the other members. Thank you for travelling here today. I hope that we will be able to make some recommendations that do your evidence today justice. Thank you so much for appearing.

(The witnesses withdrew.)

DAVID BROOKS, Individual, Honorary Associate Professor, University of Sydney, affirmed and examined

The CHAIR: We welcome our next witness. Professor Brooks, do you have a short opening statement to make?

Professor BROOKS: Yes. I do.

The CHAIR: Please make your opening statement and keep it reasonably short, if you can.

Professor BROOKS: In 1813 migrating passenger pigeons so filled skies above Kentucky the sun was almost blocked out. The last passenger pigeon died just on 100 years later. The American bison, around 1789, had a population of over 60 million. By 1889 they were down to 541. They say that once in Australia there was a koala in every tree. Now you would be lucky to find one in every State. We are told kangaroos are in plague proportions but, strangely, in an age when every mobile phone has a camera, photographic evidence is very thin on the ground. Ask to be shown the kangaroo plague and it seems no-one can find it, or the kangaroos are hiding in their caves until nightfall. Relentless human predation has led to and systematically inflicts tremendous damage upon kangaroo mob culture and the social and psychological health of the individuals comprising it.

As far as kangaroos are concerned and regardless of their current numbers, the process of extinction has already begun through cultural collapse. The principal points of my submission were serious anomalies in the population estimates that we have historically and current population estimates and that, without some sort of estimates that we can actually give credence to, any discussion of kangaroo health at this particular point in time is going to be lame, if it can be effective at all. The other point of my submission—it is remarkable to find myself following Uncle Max, speaking as he just has—is about kangaroo culture and the collapse of kangaroo culture through the practices of human predation that have been afflicting them since 1788.

The third point of my submission refers to a kind of vision of a different way of doing this. That is by—you will hear and you have heard already many arguments about the absolute necessity of kangaroo control. The only option for kangaroo control that seems to have been offered to you by those who are advocating it is a lethal option. There are many other options other than the lethal option. Of course, the one overriding principle is budgetary. The overriding problem is budgetary. We get the research and we get the solutions that we are willing to pay for. It seems that when it comes to wildlife we are not willing to pay very much at all, and that any non-lethal options are put aside because they are too expensive.

I think that if I had one dream that could be offered to you, it is simply that were we to withdraw the lethal option and say, "I am sorry, that is not on the table. You have to find something else," something else would be found. We do not have to control our wildlife the way that we control it at the moment. That is intellectual laziness, scientific laziness and budgetary meanness. If we change the parameters and insisted that something else be found, something else would be found. I had many more introductory remarks to give you, but this topic of kangaroo health is so complex and so extensive that I think we better get to your questions as quickly as possible.

The CHAIR: Thank you very much for your opening statement, Professor Brooks. I will go to questions from the Deputy Chair.

The Hon. MARK PEARSON: Thank you very much for your evidence so far and your submission. You talk about—and you actually spoke to it as well in your introduction—the health and wellbeing and emotional health and wellbeing and integrity of the mob being affected. Rather than just the killing of individual animals and them being removed from the mob, can you elucidate more on the impact on the integrity and the emotional integrity of the mob as a consequence of shooting for whatever purpose—commercial or otherwise?

Professor BROOKS: There are two principal aspects to that psychological and emotional health and the disruption of it by current practice. One is to do with the shooting—and I will address that almost immediately—and the other one is to do with land clearing and fencing and what I call "range deracination". There are two aspects. One is the potent effect on mob structure and mob health by the hunting itself and the slaughter of family members, as it were. That is extensive damage. The other kind of damage is a damage in terms of access to mob range. Mobs are territorial. They have a range that they learn about over generations and they pass on the information—very similar to things that Uncle Max was speaking about just now. They pass on their knowledge of this place and of their range from generation to generation. It may not be done in ways that human observers might be able to detect, but it is going on constantly from the moment of birth to the moment of death for every member of the mob.

We have destroyed that range and interfered with that range in any number of ways. Enclosure fencing is just one of them; it is a recent development and it is a shocking development in terms of preventing and disrupting that range and causing that deracination. It is a good word because deracination is an intellectual thing

and a psychological thing, but it actually means having one's roots pulled up out of the ground. In terms of the impact of shooting, I do not know. Imagine someone came into this room and shot four of us. There would be an impact, wouldn't there? We would be stunned, we would be shocked and we would be scarred by that for the rest of our lives. This is what happens to mobs at night. If you think about other aspects of mob behaviour and other aspects of kangaroo culture, you would realise that there is a very tragic and fundamental clash in the hunting process in the first place. I will look only at the alpha male. As I have described in my submission, I do not like the term the "alpha" male. It does not have to be the only term we use for this, but I will just use it for convenience's sake.

We have this perception of the boxing kangaroo. Young kangaroos do box and they do many other things as well in order to work out who is the strongest male, who is the male who will eventually inherit a principal protective function and become, as it were, a male elder of the mob. One of the functions of that alpha male is to guard the mob while the mob is grazing. If someone on the horizon, 100 metres away or 200 metres away, appears and presents some kind of threat or some kind of puzzle, that alpha male will stand tall and attempt to stare down that threat. Now that might work for other animals and that might work for other kinds of situations that the mob might encounter. But, unfortunately, if the threat is a human with a gun that alpha male is presenting themselves as the principal target and is the most likely to be the first of that mob to die.

You can see that the mob culture having developed and selected that particular creature, that particular individual, to become a kind of leader and that leader is taken out by the first hunter who appears with a gun, there would be immediately a mob disruption. That is one aspect of mob culture that is disrupted by the hunting process. But, of course, hunters do not take just one. They are likely to shoot three or four. They will shoot as many as they can before the mob disperses. Every individual creature who is taken out, who is shot, by hunters is a creature with a family with a network of relations within the mob. The shooting disrupts that network of relations and so forth, but it also disrupts—it takes from that mob any knowledge that individual might have of the environment, of the range. It is another root pulled from the ground, as it were, in terms of the mob's relation to its own place. I think that probably answers your question.

The Hon. MARK PEARSON: Yes, it does, very well. Thank you.

The Hon. MARK BUTTIGIEG: Professor Brooks, I just want to tease out one part your submission where you relate to paragraph (b) of the terms of reference, being:

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

You point out that there is an inherent bias towards an upward figure of a 15 per cent explosion and this is an inherent inflationary bias. We heard evidence earlier today and last Friday about how this aerial system of determining population growth is flawed. Did you want to articulate a bit more on that in terms of what causes that inflationary bias and how we might have a better way of determining numbers? Because it seems to me that this is a fundamental point of contention that keeps cropping up in this inquiry.

Professor BROOKS: Yes, it is a fundamental point of contention. So far I think you have been asking the wrong people, because I think you need to ask—I am sorry if I phrase these things incorrectly or inappropriately or whatever. These are things that a lot of the people you are talking with feel very passionate about, obviously. I think one of the problems is that we have this myth in our minds of utter objectivity and that things like statistics are not fundamentally impacted by or do not fundamentally reflect the kinds of assumptions that we come to the situation with or come to the thing being counted with. I think that one of the problems that we have with counting kangaroos is an assumption that kangaroos are plentiful in the first place, otherwise I find it almost impossible to explain to myself the anomalies that occur in the counting system. I have explained these every which way I could come up with in the submission I made. I have given tables and given different models of calculation to show how any expectation of something in excess of 10 to 15 per cent annual growth is just fundamentally impossible.

I have even explained how some of the stories we are given to try and explain astonishing leaps—when I say 10 to 15 per cent, we must bear in mind that some of the leaps that we find in the population tables that we are given by government documents, in the Government quota report and in the historical tables that go back 20, 30 and 40 years, some of the leaps that we get in different areas of the State and for the State overall on certain occasions are in the vicinity of a 500 per cent increase in the population growth in a particular area or even statewide in a particular year. I do not think it ever becomes 500 per cent in the statewide thing, but it is often in the area of 30, 40 or 50 per cent growth within one year, which is absolutely impossible by any way you approach it. I would say that, I mean, you are seeing people from the department who are responsible for these figures this afternoon and I would imagine the very first question you would ask them is, "What? How are these figures possible?"

The Hon. MARK BUTTIGIEG: Can I ask you, at that juncture, do you think that this is a function of inaccurate measurement in the sense that maybe they are looking at one particular geographical location and then extrapolating the density over a larger area?

Professor BROOKS: That is a huge—I think there are many problems in our perception of kangaroo numbers. For example—

The Hon. MARK BUTTIGIEG: Or just on that point—because this was the implication from the previous submission, I think, or the one before the previous submission—is it just a way of fitting the numbers to suit a cull? There are two different questions there.

Professor BROOKS: Yes. I realise, yes. I think there is probably immense pressure upon anyone involved in the process of determining kangaroo population estimates because the estimate has an immediate impact on the quota and a tragic one in a sense that I would love to explain in a moment. Obviously, the estimate is very significant to the public perception of the abundance or otherwise of kangaroos and the public perception is going to weigh heavily on the freedom or otherwise that people have to slaughter those kangaroos. If the public believes that there are too many kangaroos and that is an assumption that the public is conditioned to make, then the public is going to be applying less pressure to contain the cull. So obviously there was a problem there or there is a connection there.

As to how that manifests itself statistically, I think it might have something to do with, for example, the assumptions that—the willingness to extrapolate a high density or a higher density area onto the rest of a kangaroo management area. But I want to be careful there because I have read several reports from the subcontractor who is at this particular point in time employed to do these surveys and come up with these figures in the first place and I find myself—I think I would need a degree in applied mathematics or something a little bit beyond that to be able to understand some of the things that one finds in those explanations of those figures. I find those figures still very troubling. I am full of assumptions, but I would find it very difficult to explain those right now.

It would seem to me that in terms of that kind of extrapolation of a high-density area over areas that are much less populated by kangaroos is one of the systemic ways that these figures inflate themselves. And, of course, at precisely the moment that I am about to drag the second thing out of the air, it has disappeared from my mind, but it will come back in a moment. Yes, I think that one of the other problems that you might find with those figures—no, sorry. That will come back to me.

The CHAIR: That is all right. You wrote quite extensively in your submission about setting the quotas in various different parts of New South Wales and that the estimation in any given year, which we just talked about in terms of your opinion being overinflated for whatever reasons that we will hopefully get to, that it then does not take into consideration droughts and the impact on the population of that year when the next year's is set. Did you want to expand on that further for the Committee?

Professor BROOKS: Yes, please. Thank you for your question because it brought immediately back to my mind—

The CHAIR: It always does.

Professor BROOKS: I knew it would, so I thought we should move onto the next question so I could answer the previous one. The other way in which these figures might become inflated of course is in the assumption that you choose to make for the presence of the kangaroos that you cannot find and that you cannot see. If you see three kangaroos within a particular area and you assume that for every one of those kangaroos there are five that you do not see, when you see three kangaroos you will come up with a figure of 15. If you assume that there are seven, then you will come up with a much larger figure. I think that one of the principal problems is those figures are guided by a combination of anecdotal experience, individual experience and assumptions about what is likely to be there.

The Hon. MARK BUTTIGIEG: Just on that point: Has this methodology ever been challenged in the sense of the biological limits? Has anyone ever said this actually does not reconcile because the physical biological limit is 10 per cent; you guys are extrapolating 15 to 20? How do you explain—

Professor BROOKS: It has been challenged. The first person to appear before you was Ray Mjadwesch. Ray has been challenging this for 30 years, I think. He has been, let us say, punished in some ways for bringing up this kind of question and I certainly do not think he has been responded to. This information is not new; it has been raised numerous times. Ray is one of the people who comes most to mind because I sometimes have thought he has drowned almost in the statistics—looked at them very, very closely.

The Hon. PENNY SHARPE: He almost drowned us. He did a good effort.

The CHAIR: He did a very good effort. We do need to finish up.

Professor BROOKS: But he also gave you a great lesson, a simple lesson into thinking. I did a set of models in my submission utterly independent from his, and when I heard his I thought we have gone to exactly the same methodology, we have tried to do exactly the same lessons, we get exactly the same results and we have not consulted about this.

The CHAIR: I am very sorry but we have to leave it there. We are out of time. Thank you so much for appearing and for the work you do.

Professor BROOKS: You are welcome. Thank you.

(The witness withdrew.)

DI EVANS, Senior Scientific Officer, RSPCA Australia, before the Committee via videoconference, affirmed and examined

RAE HARVEY, Wild2Free, affirmed and examined

The CHAIR: I welcome our next witnesses. Dr Evans, do you have an opening statement to make for the Committee?

Dr EVANS: I thank the Committee for the opportunity to attend this hearing. I speak on behalf of RSPCA Australia and RSPCA NSW. Macropods are unique and iconic Australian native animals that are not currently afforded an appropriate level of protection. The RSPCA would first like to highlight its concerns regarding the general direction of macropod management in Australia, which comprises two different approaches. The first is based on the view that macropods are a renewable resource to be killed and processed for commercial gain. The RSPCA is opposed to the killing of wild animals for commercial utilisation, whether it be for food or other animal products, unless this is carried out as part of a wild animal management program to either protect the welfare of individual animals; to help conserve a threatened, endangered or vulnerable native species; or to help reduce adverse impacts on human activities or the environment.

The second approach relies on landholders applying for a licence to harm kangaroos through self-reporting of the impact caused by these species to justify their killing. There is no on-the-ground checking of the extent or nature of this damage nor consideration of other causes, nor is there a requirement to demonstrate how the impact has been reduced as a result of shooting. In addition, in comparison to the commercial industry, non-commercial shooting under licence to harm kangaroos operates virtually unchecked, particularly in relation to animal welfare, where there is no requirement to demonstrate shooting accuracy or competency. This is a very serious concern.

A community survey conducted by McLeod and Sharp published in 2014 found that 83 per cent of respondents viewed shooting by non-professional marksmen as unacceptable; 86 per cent of respondents believed that non-professional shooting was inhumane, with nearly 70 per cent believing it was very inhumane; and 41 per cent of respondents thought that shooting by non-professionals was not effective at reducing overgrazing impacts. The treatment of kangaroos should not be dictated by whether they are being shot for commercial purposes or under a licence to harm kangaroos.

The RSPCA acknowledges the significant animal welfare risks associated with broadscale shooting of kangaroos, particularly in relation to orphan joeys. The manner in which macropod shooting is currently conducted poses arguably insurmountable risks to the welfare of orphan joeys. When females are killed, shooters are unable to locate and humanely kill all dependent young-at-foot, which is essential to prevent a slow and painful death of these vulnerable animals. Furthermore, there is no mandatory training of shooters, either commercial or non-commercial, or competency assessment to humanely kill dependent young or confirm death. In the 2020 National Code Of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes blunt trauma is the recommended method for killing in-pouch furred and partially furred dependent young. But without appropriate training and competency assessment of operators, welfare will be compromised. There is also a need to develop alternatives to blunt trauma unless it can be shown that the use of this technique in the field is acceptable on animal welfare grounds. Even with improved methods, humane killing of orphaned joeys does not address the issue of escaped joeys.

The RSPCA has long maintained that maybe the only solution to avoid the potential cruelty to pouch young is not to shoot females at all. In addition, there is no field monitoring of either commercial or non-commercial shooters to ensure respective codes are complied with regarding the treatment of dependent young. The other important aspect is that the number of joeys killed is not included in the total kill figures. The RSPCA is also concerned with the lack of clear available data on the actual number of kangaroos killed under licence to harm permits. It is time to shift our perception of kangaroos and their place in the landscape as well as to comprehensively evaluate the impact of human activities to improve our approach to kangaroo management. We also have concerns that exclusion fencing may be considered a humane nonlethal control method, but this fencing may cause death as well as injury and suffering of entrapped and entangled animals due to exposure, predation, disease and stress.

Research is urgently needed to evaluate the animal welfare impacts of exclusion fencing on wildlife. Reliance on shooting to manage macropod populations is coming under increasing scrutiny. Gross inconsistencies and inadequacies bring into serious question the validity and integrity of how macropods are managed not only in New South Wales but across Australia. This is a national issue which requires national leadership and State and Territory collaboration to develop a national approach for macropod management to identify more effective and humane methods. An overall plan must consider all kangaroo populations holistically, rather than

compartmentalising them into those which are shot by commercial shooters and those which are not. The level and intensity of community concern and international attention on the treatment of macropods necessitates that this becomes an urgent priority.

The CHAIR: Ms Harvey, would you like to make an opening statement?

Ms HARVEY: My name is Rae Harvey and I am from the South Coast which was, before the fires, the nature coast of New South Wales. The kangaroo gets under your skin so deeply you wake up one day and you realise that they are your entire reason for living. Thank you for inviting me to speak on their behalf today. In addition to co-founding an animal welfare charity called Wild2Free, which hosts a rare release site for kangaroos, I am also an authorised volunteer carer for Wildlife Rescue South Coast. I specialise in the most emotionally fragile of the macropods, the eastern grey kangaroo. I received no funding or assistance from the Government so I fundraise in order to run the sanctuary. When I say "volunteer" I mean full-time, 24 hours a day, seven days a week, every day of the year—birthdays, Christmas and even when your house burns down.

Orphaned joeys are fully reliant on their mothers so I become their foster mother until they are old enough to join the mob at 18 months old. They are bottle-fed around the clock and follow me everywhere—just like they would with their real mothers. I take them into the bush to play and learn. They require the same level of care as human babies do. Mulberry needs reassurance by holding her head in my hands and stroking the side of her face. Then she will suckle and wrap her little paws around my arms asking me not to stop. Nova demands her dummy within seconds of getting out of her pouch, while Grace demanded a chest scratch and a special little song. Joeys are not only physically but emotionally dependent on their mothers. They are in the pouch until 11 months old and weaned from milk at 18 months. So mum is often feeding two joeys at the same time but they were born a year apart. They do not wean emotionally until they are two years old.

As a carer for Wildlife Rescue I report to the macropod coordinator once a week with the health status and weights of kangaroos in my care. If a joey dies in my care I report it immediately so that the annual statistics provided to the National Parks and Wildlife Service are accurate. All national parks licensed groups in New South Wales are governed by strict rules and regulations that carers must comply with. So I ask: Why don't the commercial industry or farmers have the same obligation to report the number of joeys they kill to the authorities? It does not seem very fair to me. There is not enough time today to address the countless inaccuracies about kangaroos that I heard on Friday, so I will only address a couple. I do not see kangaroos like you do: as wild animals in the distance who all look the same. I recognise each one individually by their body shape, face or behaviours. This bushfire victim is Honey.

Kangaroos are more emotive and loyal than dogs, and I challenge anyone to live alongside them like I do and say otherwise. They are extremely emotional, fragile and sensitive. They are communicative. It is easy for them to tell me if they want a pouch, food, love or they just want to play. And while they are so-called eating in your paddocks, they spend the majority of their time standing up and looking around because they are prey animals ready to run at the first sign of threat from dogs, eagles, foxes, reptiles and humans. One comment on Friday was we need to think about the species as a whole and not just one animal. Look into Duncan's eyes here and tell me that his life does not matter. It matters to him, it matters to his best friend Chenoa, it matters to the people around the world who sponsor him so that we can afford his care, and it matters to me. It matters so much to me that I suffer complex PTSD and persistent bereavement disorder due to the loss of joeys and traumatic rescues of wild kangaroos. They are my family.

Other comments were that kangaroos are nocturnal and they eat entire fields of grass. A farmer does not sit closely enough in the paddock with them to know this but I do, and I know precisely how they graze. In this photo of Nova you can physically see—I will hand this to you—where they have only eaten the tips of the grass. They lived here for millions of years before we did and would have died out already if they did not know how to regenerate the environment—and I would not have to slash my paddocks all the time either. They are not nocturnal, as reported on Friday, they are diurnal, meaning that they are active during the day. That is why you see them at dusk and dawn. During the day they go bush to avoid predation. Grass only plays a part of a kangaroo's diet. They eat bark, leaves, ant and termite mounds, flowers, dirt, charcoal, sticks and ticks.

They have a preference for a variety of grasses favouring native species, because the introduced grass fed to cows is too high in protein. Forty to 60 kangaroos eat the equivalent of what one cow eats and you are welcome to visit us at any time to confirm that for yourself. Why is the financial loss to farmers more important than the cost of raising a joey, which is providing a community service reassuring the children in the car that just hit a kangaroo that the joey is going to a safe place? It costs us more money to raise a joey than what that joey would cost a farmer in its entire lifetime. Why is the impact more important on farmers than it is on carers like me? The emotional trauma a kangaroo suffers is something that has not been addressed so far. How is it fair that a farmer can engage a shooter on his cow farm and despite the alleged kangaroo problem only one male and

female kangaroo were killed that night, leaving a six-month-old joey behind? His feet had never touched the soil before. He was found 18 hours later standing alone in a paddock cold, dehydrated, hungry and traumatised. I raised that Joey; he has a name. It was Morty, then it became Naughty Morty.

In closing, there is not enough time to put forward our recommendations. Briefly we recommend: compliance officers and a specific office to report wildlife cruelty with independent investigators; no commercial or non-commercial shooting near wildlife sanctuaries or release sites; funding for wildlife carers across New South Wales who are providing a community service voluntarily and paying for the privilege of rehabilitating wildlife harmed by humans, including mental health support for carers; and, a study into the true scientific benefits of the commercial killing industry versus the value of the kangaroo to the tourism industry. Finally, we also recommend an independent investigation by international unbiased experts on the kangaroo management plan, which includes counting methodologies, assuming they can find enough kangaroos left to count, that is. The treatment of our native treasured unique kangaroo is Australia's dirty little secret, and it makes me feel ashamed to be an Australian.

The Hon. BEN FRANKLIN: Dr Evans, I wanted to look at where your submission talked about the fact that "kangaroos must be managed to protect their welfare (especially during times of drought) as well as to mitigate negative environmental and agricultural impacts." Could you unpack that for me a bit more?

Dr EVANS: The audio is not that good. What page was that on in the submission, sorry?

The Hon. BEN FRANKLIN: That is a good question.

Dr EVANS: It was in relation to—actually, no, you will have to repeat that, sorry.

The Hon. BEN FRANKLIN: Can you hear me now, Dr Evans, or not really?

Dr EVANS: It is a little bit muffled, but I think it is—I just want to get the wording—

The Hon. BEN FRANKLIN: I understand. Let us go to Mark and I will find it in the actual submission.

The CHAIR: We will get Mr Franklin to find that and go to questions from Mr Pearson. I just want to check that as I am saying this, Dr Evans, you are hearing me clearly.

Dr EVANS: Yes, I am hearing you clearly.

The Hon. MARK PEARSON: If an RSPCA inspector was notified that a cull was going to occur during the evening on a property, whether it be a commercial cull or a non-commercial one, and it was pointed out to the inspector there was concern that there are likely to be acts of cruelty, that RSPCA inspector would have the power to enter the property. Is that correct?

Dr EVANS: With any of the regulatory and inspectorial authorisations, I can take that question on notice and seek advice from RSPCA NSW. My role with RSPCA Australia is concentrated on the scientific and advocacy areas rather than regulatory enforcement of the Act. Usually what happens I guess just from my understanding—and one of the things with all animal welfare legislation—is that it is almost dependent on animals to actually have suffered prior to an event occurring—as in, you cannot go in beforehand on a suspicion unless you have got some very clear evidence. You could investigate, for sure, but in terms of an actual prosecution, it normally requires some extensive evidence of suffering. This is one of the problems that we have with our legislation.

The Hon. MARK PEARSON: The legislation that I am talking about is the New South Wales Prevention of Cruelty to Animals Act, even though there are two other legislations that are in place federally and statewide to protect animals. Let's just say under the Prevention of Cruelty to Animals Act, the RSPCA has powers as appointed officers. If they were of the view they had the power to enter the property the next morning and they found heads that had not been shot through the brain and joeys that have had part of their head crushed into the ground, and if there were several pieces of evidence that would lead to the suspicion that some of these kangaroos are likely to have been killed in an inhumane manner both in breach of the Prevention of Cruelty to Animals Act or the codes of practice in relation to commercial killing, would there be grounds then for the RSPCA to run a prosecution?

Dr EVANS: Again, I think I will need to refer that—

The Hon. MARK PEARSON: It is not your portfolio. Is that what you are saying?

Dr EVANS: Yes.

The Hon. MARK PEARSON: You are the only person we have from the RSPCA unfortunately.

Dr EVANS: It would be a matter for the inspectorate to respond to that, I think.

The Hon. MARK PEARSON: There is a section in the Prevention of Cruelty to Animals Act, section 33B, where a person or a body—that can be a department—cannot knowingly permit or authorise cruelty to animals. In your view, if it is the case that the relevant departments in the environment and the Department of Primary Industries are calculating how many kangaroos can be killed by the industry or non-commercially and if that calculation is incorrect and they are saying rather than 100 kangaroos could be killed as opposed to 1,000—if they actually come up with a figure and say, "You can kill 1,000; that is the quota," but a proper analysis of the methodology is found to be incorrect, would the authorisation from that department to kill 1,000 rather than 100 be actually authorising and knowingly permitting criminal activity or behaviour?

Dr EVANS: It is a good question and I think that really that would be something that would be best answered by legal counsel. There are many lawyers who work in animal welfare law and I think that you would probably have a number that would be very interested in looking at that particular question.

The CHAIR: Mr Franklin has found the relevant page.

The Hon. BEN FRANKLIN: I have a direct follow-up to that before I move to my question. In terms of the numbers, Dr Evans, I note that your submission said:

The RSPCA understands that the methodology used to estimate population densities of kangaroos and other macropods has been scientifically assessed to be reasonably accurate.

Is that your position?

Dr EVANS: That is what we have put in our submission, although I must say that this is an area that we do not have specific expertise. I think one of the useful outcomes from this inquiry is to have input from many different researchers and scientists in this space. But in terms of what we know at this point—and, as I say, we tend to focus more on the welfare elements, but that is not disregarding the importance of population density estimations, which is absolutely critical. But in terms of the commercial harvesting context, just relying on population densities, if I go back to the opening statement with regard to the justification for continued harvesting of kangaroos, it is really not considering at all the environmental impacts. It is purely based on a population density. In some ways, that point could be a little bit moot.

The Hon. BEN FRANKLIN: Indeed. I guess we will be talking to the department about that this afternoon. The point that I was making is, in fact, in paragraph 3 of the introduction to your submission where you say:

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.

I was just wondering whether you could elucidate on that a little more.

Dr EVANS: In terms of, I guess, environmental impacts, as long as they are robust assessments. The RSPCA does not object to the management of animals in the wild context as long as that justification is based on robust assessments and the measures that are taken are effective and humane, and there is also follow-up evaluation of the success, if you like, or otherwise of those measures. Just to be clear, we do not outwardly oppose management, but it depends on what that is based on, how it is done and what the results are.

The Hon. BEN FRANKLIN: I would like to take you now to your concluding paragraph, which says:

A co-ordination of resources and process is required to address this so they are not left to die a slow, painful death.

This is kangaroos that are starving or dying from thirst during drought. I was wondering if you could elucidate a little more on the coordination of resources and process that you believe can be implemented to assist in ensuring that kangaroos during drought are not left to die a slow, painful death.

Dr EVANS: Okay. There is probably a pre-empt to that as well, and that is in terms of a more holistic view in relation to the management of the whole landscape and managing as best we can and mitigating the negative effects of climate change to reduce the severity and the prevalence of droughts per se. So that is one point to make. By looking at this in a more holistic view, we should be able to have preventative measures and better management to reduce those impacts in the first place, both in terms of the number of animals affected as well as the nature and extent of that impact. I have mentioned in the submission about the coordination of resources. Like any of these issues, we need key stakeholders and all those affected by this, including landholders, and we have heard that there are devastating incidences where kangaroos and other animals are dying out in regional areas because of drought.

If we are able to really look at this—and I think it was mentioned earlier today—particular issue about managing wildlife during drought situations has not received adequate time or dedication of resources for people who could help develop proper planning to sit down and actually do this. This needs to be facilitated as a matter

of urgency actually, as we have seen this particular situation is likely to increase. So I do not have specific answers. My answer to that question is that we need to talk about this and look at all of the factors to try to develop proper planning and responses. We have had this issue with emergency responses, with floods and fires in regard to maintaining and protecting the welfare of animals, including keeping people together with their companion animals. That was never considered an issue in emergency response but we have seen this as being something really critical. It is pleasing to see that more emphasis is being placed on how we are responding and how we consider animals and animal welfare in these particular emergencies and adverse events.

The CHAIR: Ms Harvey, around where you will live—whereabouts on the South Coast is it?

Ms HARVEY: I am in the Mogo State Forest, near Batemans Bay.

The CHAIR: Is there much commercial shooting or non-commercial killing of kangaroos in and around where you are?

Ms HARVEY: No, that is why we live there. We had to spend a long time searching through New South Wales to find somewhere safe to release kangaroos. It took us 12 months to find a property that was safe enough and that is where we found it.

The CHAIR: The kangaroos and the joeys that come into your care, do they come from a wide area?

Ms HARVEY: They come from the whole Eurobodalla-Shoalhaven area.

The CHAIR: So some of the joeys are coming as a result of their mothers being killed?

Ms HARVEY: All of them are coming as a result of their mothers killed, yes, including in shooting.

The CHAIR: So the shooting is occurring in the Eurobodalla area, just not right near where you are?

Ms HARVEY: Non-commercial farm shooting.

The CHAIR: Sorry—what is occurring?

Ms HARVEY: Just on farms. So non-commercial shooting.

The Hon. PENNY SHARPE: So licensed culling by farmers?

Ms HARVEY: If that is what you call it.

The Hon. PENNY SHARPE: Well, that is how it is described.

Ms HARVEY: Or non-licensed or just random because they feel like it. Plenty of that is going on too.

The CHAIR: Could you just expand on it? That is what I was getting to really, trying to work out what was happening in your area.

Ms HARVEY: Yes. I can talk about Rufus. A man stood on his patio just taking pot shots because he was bored one night at anything that moved. He did not have a licence; he was just bored. That is how we got Rufus into care. He was left on the ground, of course, and a neighbour collected him. That is how he came into care, otherwise he would have died alone like many of them do.

The CHAIR: In your area, from what you have seen in terms of the evidence from the joeys coming into your care or anecdotes you hear about what happens on the ground in terms of the non-commercial killing, on-farm killing, did you have any other comments to make to the Committee about what you hear occurs?

Ms HARVEY: Firstly, I guess we would not have shooting orphans in care if the code of conduct was being adhered to for a start, would we? There is also a story of a kangaroo called Winnie. She was 12 months old and she was rescued out of her mother's pouch. Remember, she is 12 months old. She is at-foot and she is so terrified with the noises that she squashes back into mum's pouch. Mum is dead, so she gets cut out. I sent a letter to National Parks and Wildlife Service and made a complaint about the situation that happened that night. They sent a letter; nothing else happened. A few months later, police have to be sent to the very same property that a complaint had been made about to euthanise an adult male kangaroo that had been left lying there for 24 hours—still alive—because they are not complying. There is nobody there to make sure that people are doing it right. The way we treat kangaroos in this country—they are just pests, right? They need to be eradicated as far as half the population is concerned. There is just no empathy for the animal welfare at all.

The Hon. PENNY SHARPE: Obviously people are aware of your sanctuary, and thank you for the work that you do. What is your contact with National Parks and Wildlife Service in relation to compliance? Do you know the compliance officers? Do you work with them?

Ms HARVEY: Do they have compliance officers?

The Hon. PENNY SHARPE: That is what I am asking you.

Ms HARVEY: Not that I am aware of. Like I said, we put a letter in, and then it was just our local office that sent a random letter out, but that was it. That is as far as it got. There are no investigations into anything.

The Hon. PENNY SHARPE: Do you have a face-to-face relationship with your local National Parks and Wildlife Service office?

Ms HARVEY: No, that is an hour and a half south of me, so no.

The Hon. PENNY SHARPE: Sure.

Ms HARVEY: I do not leave the property because, just like in the wild, joeys are 24/7 care. I have got two volunteers looking after the joeys to be here today.

The Hon. PENNY SHARPE: I appreciate that. I am interested in just how much engagement, or lack thereof, there has been from National Parks and Wildlife Service in relation to their responsibilities.

Ms HARVEY: In my opinion, they are not invested in the welfare of kangaroos or wildlife whatsoever.

The Hon. MARK PEARSON: Ms Harvey, when it has been put in the past as to why we did not stop the commercial or non-commercial killing of kangaroos after the fires, a lot of the arguments came that, "Well, you know, the fires did not affect any areas where there is commercial killing or non-commercial killing." What is your understanding of how far kangaroos will go to flee fire?

Ms HARVEY: As far as their feet can take them I guess.

The Hon. MARK PEARSON: So you think they would move further than what they would normally be inhabiting. They would move onto possible areas where these—

Ms HARVEY: There were commercial killing areas that were impacted by bushfires on the other side of the Great Dividing Range behind Batemans Bay—down towards Canberra and Braidwood. They are commercial areas and they were burnt. They were very badly burnt, so there was absolute impact in the commercial killing zone. What I recall about that period was when a friend of mine, Marcus, drove two hours to get to me to spend time on my property looking for injured wildlife so that we could dart them—because they are wild—to give them treatment. On his way home he passed vehicles full of kangaroos. Clearly the shooters had been out in force just after the fires because they were easier to find. You cannot find many kangaroos out there now, but the ones that were left were certainly killed as far as I know.

The Hon. MARK PEARSON: Back in 2018 the then primary industries Minister lifted the requirement for drop tags or let lie tags for farmers if they were to do a non-commercial kill or cull on their property. I think that was in August 2018. Have you noticed any difference or change in the level of activity of shooting since that change happened?

Ms HARVEY: Well, again, I am not in a commercial killing zone obviously.

The Hon. MARK PEARSON: These are non-commercial.

Ms HARVEY: On the farms close to me, there is no shooting. That is why we are there. We have taken shooting orphans—Morty was 2019. So, January 2019 was our last shooting orphan. There is obviously still activity.

The Hon. MARK PEARSON: Dr Evans, you refer to cluster fencing or exclusion fencing in your submission. You make it clear that the RSPCA is critical. Has the Government or the Local Land Services ever consulted the RSPCA for advice when the request and the idea or policy to stop long exclusion fencing from occurring? Was the RSPCA ever consulted as to what may or may not be the impact on animals?

Dr EVANS: In terms of local contact within New South Wales I am not aware of any correspondence. I largely believe that the animal welfare impacts are generally disregarded in terms of exclusion fencing, but there are certainly many observations of suffering that occurs with animals that are entrapped. The other problem that you have is that there is no surveillance and being in remote areas too, even if the animals were found to be in trouble getting help to them quickly is generally very limited. We are aware that there is a major research study in Queensland where cluster fencing is particularly prevalent, and this is mainly in relation to economics and effectiveness. I have spoken with a couple of the researchers to encourage that welfare assessments be undertaken, but to date I have not had any indication that that is the case. But there are certainly some very serious issues that are not being either acknowledged, quantified or addressed.

The other issue, which I know was brought up on Friday, is to do with barbed wire. The majority of these fences have barbed wire. Could I table a document that has been produced by Land For Wildlife Queensland, a

note on more humane alternatives to barbed wire? I can ensure that the Committee has access to that document. This is an absolutely serious welfare issue.

The CHAIR: We will make sure that that is tabled. Thank you.

The Hon. MARK PEARSON: There has been one study of exclusion fencing or cluster fencing and a witness who did that study gave evidence last Friday. In that evidence he actually said that there is a benefit for kangaroos and other wild animals to be inside an exclusion fence. What do you think about that statement?

Dr EVANS: Well, if you look at kangaroos who may be entrapped within a fenced area, logic tells us that the grazing pressure in that space will increase over time. Therefore there is a very high probability that there would be a licence to hunt kangaroos permit or application lodged to shoot those kangaroos. So they are unable to freely move as they would across the landscape to seek other food and water sources. There is a real danger that that could in fact be an issue.

The Hon. MARK BUTTIGIEG: Dr Evans, paragraph (f) of the term of reference (f) reads:

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

We have heard evidence today from both of you and I guess what I am hearing is that there is this big dichotomy. There are two worlds, if you like. There is the welfare and care world, which people like yourself are involved in and are doing a great job of caring for joeys and kangaroos and all that sort of thing. Then there is the shooting world, where there is not much regard at all or monitoring of how these animals are shot and killed. I am interested to know to what degree has there been dialogue between organisations like the RSPCA and the Government in respect of how the Biodiversity Conservation Act is met with? There is the suggestion here that operators could wear body cameras and that way regulatory officers could download the footage. That would be one way of efficiently regulating. I just want to know to what degree this dialogue is occurring to try to reconcile what seems to be a pretty big gap in what we would ideally like to see happen and what is happening.

Dr EVANS: Certainly where there is any focus on kangaroo management at the Federal department level, the RSPCA has consistently advocated for much more rigorous on-the-ground monitoring. We also have concerns that the head is removed from carcasses so that essentially the only audit, I guess, in terms of the shooting procedure itself is at the processing plant. But if you have removed the head—and I understand that this can be done quite low down the neck with the cervical vertebrae being removed—you are not going to be able to accurately assess that. So that certainly is an issue.

Obviously there are limited resources in terms of compliance officers, if you like, going to properties. These are night-time activities so that is probably not a very encouraging feature of undertaking these sorts of audits. Having a body camera might be one way of being able to assess on-the-ground procedures in terms of the actual shooting process. Also, it would allow a better gauging of the number of kangaroos that are wounded or are not receiving a brain shot. Those sorts of figures are not reported either as well as what was previously mentioned—that is, no data recording the number of joeys who are either killed or allowed to escape or are not actually killed by the harvesters. If you look at the Sharp and McLeod study of harvesters, the 2016 publication, nearly 80 per cent were reported to have spent no time in attempting to euthanise or search for young at foot when the females were shot. That is a massive deficiency.

The CHAIR: Thank you very much. We are out of time.

Dr EVANS: Can I mention one more really critical thing that perhaps the Committee has not looked into with any rigour? I am not blaming anyone; it is not a criticism. That is the management of peri-urban kangaroos. This is a significant issue. It is right on the borderline of our cities, whether they are regional or central based. What is happening is that land developers and others end up with a huge problem because there has not been sufficient planning and action taking place to avoid numbers building up in these peri-urban areas where you have land development happening. It would be an ideal opportunity to really consider that particular issue. I did include some of that information in the submission, but I do note that it probably has not been a topic of conversation in the hearings to date.

The CHAIR: Thank you for bringing that to our attention. Unfortunately we are out of time for this session. Thank you, Dr Evans and Ms Harvey, for appearing today and for the work you do.

(The witnesses withdrew.)

(Luncheon adjournment)

DIANNE SMITH, Individual, affirmed and examined

GREG KEIGHTLEY, Individual, affirmed and examined

The CHAIR: We will begin the next session. Do either or both of you have a short opening statement to make?

Mr KEIGHTLEY: Yes, I do. Thank you to the Committee for inviting us to provide evidence today to the inquiry, and thank you for the foresight and wisdom to conduct an inquiry into the wellbeing of kangaroos. Ms Smith and I are wildlife rescuers and carers. We are the people who live at the coalface of the kangaroo industry, the nightly violence. We pick up the pieces of Australia's disregard for kangaroos. We come to this inquiry not as activists, as we have been labelled by government and industry representatives. We are not activists. We are just a couple of people who bought a big block of dirt to conserve, protect and coexist with its inhabitants—to do some good for the world and have some peace.

We did not go looking for a cause to champion. The cause, the massacre of kangaroos, came to us. Once we were forced to see it, it could not be unseen. The pain and suffering we witnessed and have continued to witness for almost 15 years requires us to take action just as citizens of the world. We as a society should not abide cruelty in any form and particularly not of the virulence we have witnessed. We are able to speak to so many aspects of the inquiry's terms of reference and we are more than happy to answer any questions or go in any direction you wish. But for us the most important thing to discuss with you today is the pain and suffering inflicted upon these gentle, loyal, family-orientated beings by Australia's commercial kangaroo industry.

Data collected during a 10-year study into the likelihood of commercial kangaroo industry harvesters providing instantaneous loss of consciousness to the kangaroos that they target via a single shot to the brain shows a "brain case intact" or "brain case fractured due to secondary trauma" result in 32 to 42 per cent of cases. That is around four out of every 10 kangaroos targeted by the commercial kangaroo harvester who are conscious and aware, in blinding pain and terror, after being shot—40 out of 100 who try to stand up and flee or who beg for their lives, clicking and grunting as the harvester approaches to bludgeon them to death or cut their throats.

Working with our vets, we have noted that these miss-shot kangaroos often have to die slowly with their injuries for up to two weeks as they slowly starve to death or as their organs shut down. This level of animal cruelty is unacceptable in Australia and internationally. It is virtually impossible for even Olympian-calibre shooters to hit a five-centimetre target from 100-plus metres with the consistency required to provide the so-called humane outcome for kangaroos claimed by the Australian commercial kangaroo industry. These guys, the professional shooters whose work forms part of our study, are the best in their field. They have done their training and they have passed their tests, apparently. They have been scrutinised by RSPCA and the environment department and everything has been given the all clear. What we witness and have over the past decade is benchmark harvesting at its finest and still the best they can do is strike the brain of a kangaroo, at our estimate, 60 per cent of the time.

What we can tell you is there no monitoring at the point of kill, so until we began gathering evidence there was nothing to dispute the information on shooter accuracy that you would have been given. Even we believed the shooters when they told us initially that they achieved an instantaneous death for the animal—until we started watching. What we need you to know is that kangaroos who are shot, even close to their brain, can still stand up and run with their injuries. Kangaroos with bullet wounds to their faces, eye sockets, jaws, shoulders and necks can survive for hours, days and even weeks. Analysis of our data shows that around 10 per cent of kangaroos shot by the commercial harvesters are miss-shot and abandoned or left in the field for other reasons. Jaw-shot female kangaroos flee the shooter but cannot eat or drink so starve to death or succumb to infection or maggot infestation. They continue to produce milk so their in-pouch joey survives, only to drown in their own urine and faeces within the pouch because the mother cannot clean her baby or her pouch. We have rescued many kangaroos in just this situation.

Our experience in regional New South Wales is that there is no monitoring and no protection for the kangaroo out there in the dark. Nobody is watching. Over the past decade we have made hundreds of reports to the authorities, to the agencies, and all of this evidence is included in a correspondence file supplied to the Committee. The only time this evidence contributed to a successful outcome was when a harvester got a small fine for killing 61 kangaroos without the correct licence and on the wrong property. I have made some very big statements there, but we are happy to answer any questions on this. Our evidence today totally contradicts any assurances that you have been given from government and industry about welfare, accuracy and compliance.

The CHAIR: Thank you very much, Mr Keightley, and thank you both for your submissions to this inquiry and for being here today.

The Hon. MARK PEARSON: Thank you very much for your submission and the evidence so far. Will you just clarify something for me? You said that a shooter who did not have a licence to kill 61 kangaroos and who shot them on the wrong property was actually fined. How much was he or she fined?

Ms SMITH: Six thousand five hundred dollars.

Mr KEIGHTLEY: Yes, \$6,500.

The Hon. MARK PEARSON: No prosecution at all for cruelty or anything like that?

Ms SMITH: No.

Mr KEIGHTLEY: No.

Ms SMITH: In the hearing notes they specifically said there was no cruelty involved.

The Hon. MARK PEARSON: Did he have a licence to kill the kangaroos and was just on the wrong property?

Mr KEIGHTLEY: He had a licence to kill kangaroos but he was swapping his tags from other properties, because he had shot them out on other properties over a period of years and so he was looking for new properties to shoot on illegally.

The Hon. MARK PEARSON: Have you ever seen an inspector go to a property while shooting is occurring or just after shooting has occurred without being triggered to do so by a complaint?

Ms SMITH: No.

Mr KEIGHTLEY: No.

The Hon. MARK PEARSON: And you have been observing properties adjacent to your property for how many years?

Mr KEIGHTLEY: Since 2007.

Ms SMITH: Yes, so almost 15 years.

The Hon. MARK PEARSON: As far as you are aware, has the RSPCA ever actually done an inspection of a property and the animals on the property after a shooting?

Ms SMITH: The RSPCA came to our situation one time and helped us remove an intact male kangaroo who had been shot in his abdomen and died over 36 hours. That was the only time they actually did a property inspection directly related to commercial shooting.

The Hon. MARK PEARSON: Sorry, that was a kangaroo that was shot in the abdomen and died over—

Ms SMITH: Thirty-six hours.

The Hon. MARK PEARSON: When they removed the body, it was dead.

Ms SMITH: Yes. They would not come when it was still alive, no. We rang several times but no-one could attend.

The Hon. MARK PEARSON: Because of the distance, or another reason?

Ms SMITH: I do not know.

The Hon. MARK PEARSON: Okay. Had the inspector who moved that body been informed of who shot it?

Ms SMITH: We just told them it was a commercial kangaroo harvester because we did not have the identity of the shooter.

The Hon. MARK PEARSON: But is it your understanding that if there was a commercial shooter on the property, it would be quite easy to find the name because the landowner has to give permission to X person to do that?

Ms SMITH: Yes.

The Hon. MARK PEARSON: So it could easily be found.

Ms SMITH: And there were property-specific licences back then too, so the person actually had to have signed—they had to have supplied their name to obtain a licence for that property.

The Hon. MARK PEARSON: What was the attitude of the RSPCA inspector to you, or both of you?

Ms SMITH: That inspector was okay. He was fine. He was actually quite helpful but, on the whole, RSPCA inspectors have been dismissive of us and generally show a lack of concern for kangaroos—even contempt. Would you say that too?

Mr KEIGHTLEY: Yes.

The Hon. MARK PEARSON: How many heads have you collected over this long period of time?

Ms SMITH: Two hundred and five.

The Hon. MARK PEARSON: Is it your evidence that 60 per cent, according to the veterinarians who have examined the skull of the head, have not received—sorry, only 60 per cent have received a clean brain shot?

Ms SMITH: That is correct.

The Hon. MARK PEARSON: Therefore, for 40 per cent of those heads, it is quite clear to the veterinarian that they did not receive a clean brain shot.

Ms SMITH: Yes.

The Hon. MARK PEARSON: Was there any work done on the percentage of jaw shots?

Ms SMITH: We are in a stage of the study where those sort of analyses are coming, but we have not actually had the opportunity to look closely at shot locations yet.

The Hon. MARK PEARSON: Have you contacted the relevant regulatory authorities and the Department of Planning, Industry and Environment [DPIE], or RSPCA, or the police in relation to these 205 heads?

Ms SMITH: Over the years we have spoken to them and told them we have evidence that brain shots do not actually occur 60 per cent of the time, but once again it is just dismissed, you know.

The Hon. MARK PEARSON: How many of those heads did you collect in the last 12 months, would you say?

Ms SMITH: That is a good question; maybe 30.

Mr KEIGHTLEY: That is in your report.

The Hon. MARK PEARSON: Yes. We can look at that for the detail.

The CHAIR: I might just jump in with a couple of questions. In your submission, you detail the difference between commercial and non-commercial killing of kangaroos. Am I right in thinking that, because you are wanting a phase-out of the commercial cull, but then you want, potentially, a non-commercial cull if necessary, but regulated differently? Is that correct?

Ms SMITH: No. I think we should stop killing kangaroos completely.

The CHAIR: The non-commercial killing of kangaroos, you write in your submission about—I think, particularly, from 2016 to 2017 you said it got horrendous, and then the situation changed in 2018; it was still horrendous but because of the drought—do you want to talk a little bit for the Committee about what was happening on and around your property at that time?

Ms SMITH: Well, the commercial kangaroo harvester was coming in probably once every three weeks or so but then once the kangaroo protection laws were watered down the farmer started shooting kangaroos as well. So, on many occasions the farmer, the neighbour, would be shooting kangaroos and an hour later the commercial kangaroo harvester would come in and shoot other kangaroos.

The CHAIR: What was this doing to the numbers? We have heard quite a bit about numbers and estimating numbers of kangaroos in the area. What was this doing, over time? How long have you lived on your property again?

Ms SMITH: Fifteen years.

The CHAIR: Over time, factoring in the drought—because we have had some witnesses say that the numbers decline according to drought—

Ms SMITH: Our property is not affected by the drought.

The CHAIR: Over time, what has the shooting done? Where is it at numbers-wise now, do you think?

Ms SMITH: Well, can I just say our property is not in a drought-affected area.

The CHAIR: Yes.

Ms SMITH: The arguments to kill kangaroos for their own good because of the drought do not apply statewide. They might apply in the desert but they do not apply in the mountains, and so our kangaroos have never been at risk of starving or dying of thirst. There are dams that have always been more than half full. There is a creek running behind our property. It is always running. There is no risk of starvation or dehydration there.

What we have seen over the 15 years as a result of the shooting is a complete decimation of the male population of kangaroos. They reached a point in 2017 where there was not an adult male kangaroo on our property. Once they took out all the males they started on the larger females, so we got down to sort of young female mothers who were about 20 kilograms, and that was it. They just wiped out the whole adult population, which is devastating for us because that is why we are there. The whole reason we moved there was because it had large stable groups of kangaroos that interacted with their environment, as they should.

The CHAIR: Do you have an estimate, I suppose, over those 15 years of what has happened in terms of the numbers? You have talked about the males and the bigger females. Is it possible to talk about what has happened?

Ms SMITH: How many have actually died?

The CHAIR: Yes, or a rough estimate in terms of—

Ms SMITH: Hundreds. Once again, the data is at the point where we are going to get that sort of information readily available, but we would need to go back and look through the shooting events and count how many we have got.

The CHAIR: Do you think that the kangaroo population there is still viable?

Mr KEIGHTLEY: It would be barely viable after—the commercial industry opened zone 49 in that area in 2009 and it has been ferocious ever since. So, by 2016-17, we had lost all the males. So that is really hard for the recovery of a species if all the males are gone. We are still getting commercial harvesting over our three square kilometres and our study area is around six square kilometres of agricultural land on the interface of our bushland. So, yes, it is highly likely that they will not recover, and even the Government's own—I would like to take this document, which is the *2021 Quota Report*. In zone 49 at the south-east zone—it was released on 8 June, so only just before this inquiry commenced. The Government has adjusted the figures of the kangaroo population within our zone where we live—23,000 square kilometres of zone 49 just over the Blue Mountains—and there is a reduction of almost 50 per cent of the population. The figures have just come out on 8 June. Since the last count in 2018, in the last three years, the population has dropped by almost a half.

The CHAIR: That does not sound like a sustainable management policy for kangaroos.

Mr KEIGHTLEY: No. It is pretty ordinary.

The CHAIR: A drop by that much.

Mr KEIGHTLEY: Over that area, yes.

The CHAIR: I have other questions to ask but I look to my colleagues. The Hon. Ben Franklin?

The Hon. BEN FRANKLIN: Firstly, we have had a bit of evidence about the boom and bust of the kangaroo cycle. I was just wondering if you could comment on that particular point with the evidence that you have given today.

Ms SMITH: We have a lived experience of kangaroos so we are not scientists, you know.

The Hon. BEN FRANKLIN: I understand that. That is why I am asking.

Ms SMITH: So, what I can say is that I know female kangaroos who do not breed every year, as they could if they wanted to. They often wait three or four years in between joeys. I know that we have 10-year-old female kangaroos who have never had a joey survive; so they have been taken by predators or run over or they die of natural causes or they get shot, or whatever. So the boom and bust theory just does not seem to work in reality. You know, it is a theory. I think some of the scientists have actually said that kangaroos can only increase their population by 10 per cent per year. What I have seen backs that up.

The CHAIR: I have just got a question in relation to your submission. I was wondering if you could expand on this bit. You said:

The relentless Commercial and Non Commercial massacre continued into 2014 then 2015, all the while we gathered data and evidence, requested information and assistance, transparency and justice. We asked for help from Police, OEH—

which of course is now within DPIE—

RSPCA, Members of Parliament, State Government Ministers, Non Government Legal and Environmental agencies, Solicitors.

Essentially, you did not get that assistance. Would you just like to expand on what you were asking for and whether you wanted to tell this Committee any specific examples of your requests for help just going ignored.

Ms SMITH: We began requesting help because the shooting was so relentless. There was so much kangaroo shooting that it could not possibly be legal and it could not possibly be sustainable. So where is the agency that would want to help with that—the Office of Environment and Heritage [OEH], or DPIE as it is now. They just disregarded us.

The CHAIR: Whereabouts exactly? When you are saying "the shooting"—whereabouts? It is near Lithgow, is it?

Ms SMITH: It is about halfway between Lithgow and Mudgee.

The CHAIR: Okay, got you—that side.

Ms SMITH: Just on the western side of the highway.

The Hon. MARK PEARSON: What caused the increase in male kill over that period of time do you think?

Ms SMITH: I guess it is probably just greed. Because males are generally bigger, they are the first targeted.

The Hon. MARK PEARSON: Are you aware that Macro Meats announced to the world that they were going to do a male kill only for a period of time?

Ms SMITH: Yes.

The Hon. MARK PEARSON: You have obviously seen this extraordinary impact on these mobs of kangaroos. We heard some evidence earlier from Professor Brooks about the emotional and other impact on the mob, including the integrity of the mob. Can you tell us a bit about both those things that maybe you may have observed if you are seeing these kangaroos coming and going through your property? You are observing them, I imagine, in the evenings and then you know what is happening to them—they are being shot around the area. We are getting this picture that not only is it the deaths and the harm from the actual attempt to kill or killing but there seems to be another impact that is occurring on the mob. Can you elucidate on that a little bit?

Ms SMITH: Absolutely. From the male kill perspective, the males play a really large role in the family structure. They take over the parenting of the male joeys at about age two. So when there are no adult males, the male joeys do not get parented properly and the structure just falls apart. What we saw was larger females trying to take over that parenting. Once they were targeted it just all completely fell to pieces. And I've lost it a little bit, sorry.

Mr KEIGHTLEY: If I could add to that, part of our research is looking at stable mobs of kangaroos that have not been fractured by shooting, whether it be non-commercial or commercial. When you see a stable population—a community of kangaroos—they maintain their numbers and they maintain their ability to be sustainable in the landscape. What we saw over the last 10 years with the death of thousands of kangaroos from a combination of different waves of killing is that the actual action of killing the kangaroos and the manner that we kill them—all that does is, on occasion, create a bigger problem. When you see a stable group of kangaroos, you have not got a lot of young ones. You have got a bachelor group, you have got the females and it just seems that that is how it is meant to be, of course. Once we start taking out the large males, once you have lost that population dynamics, they lose that integrity and—

Ms SMITH: Hierarchy.

Mr KEIGHTLEY: —hierarchy, yes. You have a higher mortality in the kangaroos that are left and you have a lot of females trying to reproduce, as we would after losing people in the wars. You are looking at trying to build up but that does not happen because they have not got the structure to maintain that, so it is working against the actual goal of reducing the numbers on occasion.

The Hon. PENNY SHARPE: In your submission—it is only a small part of your submission because I know it is very much about the land that you are on. Someone raised this morning the issue around the impacts on kangaroos in terms of peri-urban environments and what you were seeing there. I just wondered whether you

wanted to comment to the Committee. I assume from your submission that that was sort of the catalyst for you to try to find the sanctuary, but I was just interested in the impact of development on kangaroos on the edges of our cities.

Mr KEIGHTLEY: We did participate for the first six years of caring for wildlife in the rescue of the larger animals in the Sydney Basin, particularly western Sydney. We were very high-volume respondents to those sort of kangaroos and macropods in conflict with development and roads, which is the reason why we went and bought a property to look for better outcomes and to be able to research. It is a real problem and it is continuing. Particularly, there are studies at the moment into the eastern grey kangaroo and how it is just hanging on in western Sydney. There are populations in remnant bushlands. We used to deal with those guys and they were pushed out. We saw developers who fenced off large areas and pushed kangaroos out onto the roads. We had to deal with that.

Then working with Lendlease on large developments like the former Australian defence site of St Marys, I was part of a macrofauna management team there advising Lendlease on how to get better outcomes and that is still continuing today. There are big problems—there is no doubt about it. I am surprised that there are very many macropods left in that area with the flurry of development around that area. They are certainly not given consideration during the development stage whether it be at a local or State government level—very little consideration of the large fauna, which is interesting because it is all the little things that we do not see that perish, like the turtles. We have dealt with, in the Penrith Lakes Scheme, hundreds of turtles trying to get out of large water bodies that have been there for a long time—trying to get out before all the water is gone and the sump pumps pull them with it. It is the things you do not see, but it is the fact that with macrofauna—big fauna—you can see it, particularly on that urban interface on remnant bushland and the development.

The Hon. PENNY SHARPE: Because kangaroos are not considered endangered—this Committee has spent a lot of time looking at koalas, and clearly there are some rules and regulations around clearing where there are populations of koalas. Kangaroos do not have the same protection, do they?

Mr KEIGHTLEY: No, certainly. They seem to be dispensable in the process and they are just pushed out.

The CHAIR: Could you comment a little bit more about your observations in relation to the killing of kangaroos and the impact that that can have on foxes and wild dog populations, which you also talk about in your submission?

Mr KEIGHTLEY: It is an interesting phenomenon. We started looking at this because we saw the cruelty, then we started to observe and then we started to collect evidence over a period of a decade. One of the things that was very obvious was watching the increase in feral animals, even pigs, wild dogs, which are usually uncontrolled—hunting dogs, not dingoes—and foxes around our area. Over six square kilometres where we were monitoring what was happening as harvesters shot on three different properties—and these are large properties of between 200 and 400 hectares—we saw an increase in the foxes in particular and also wedge-tailed eagles, which we were not so worried about, because there were tons of offal left over.

When we were locating butchering sites, a typical butchering site might have 12 heads, 12 viscera—which is like a five-kilogram bag of potatoes, for want of a better analogy—legs and arms. Everything was there and it was scattered over an area. When we started to collect that evidence, we had to get there before the foxes got there because they love to take a kangaroo head back to the den. You would lose the ability to be able to collect evidence so we had to be very quick.

We also saw harvesters that would throw the heads as they cut them at the back of the truck—would throw them to the fox that was travelling behind and a number of foxes on occasions as well, which is just obscene in an environmental sort of way. The obscenity of killing a native animal perhaps for pet food and then to throw its head to a fox so that it takes it back to the den—so, once again, the clean and green label for the commercial kangaroo industry is not so clean and green. There are lots of grubby little secrets like that that we exposed along the way and we were quite surprised.

The Hon. PENNY SHARPE: I want to go back to monitoring and compliance. The commercial area is dealt with in one part of the department. National Parks and Wildlife are responsible for the non-commercial. What is your relationship with those agencies? Obviously you have a lot of experience. I am interested in whether there is any outreach. How does that relationship work?

Mr KEIGHTLEY: It was all a learning curve for us in the beginning. You see from the correspondence file there was a lot of correspondence. We kept a high rigour—

Ms SMITH: At all levels.

Mr KEIGHTLEY: At all levels. We went to ministerial in the early days, between 2007 and 2008. Then we went back down to local level but we found a reluctance. We were interviewed on one of the occasions by two national parks officers, one who said that we had already said too much—we had given that particular national parks office a chance to cover up. This is the level of professionalism in their investigative process. He said, "I'm your contact from now." By the end of the day he made a call and said, "I'm no longer your contact." So we knew—alarm bells rang right from the beginning. It got better for a period of time but we had to do a lot of—we applied for many, many Government Information (Public Access) Act [GIPAA] requests. We were extracting—because we could not believe the ferocity of the shooting or the numbers. There were 850 in that area that we quote in our report. So we were able, through the Office of Environment and Heritage [OEH] privacy avenues, to keep getting non-commercial and commercial data and we could not believe the numbers. We kept asking questions.

The Hon. PENNY SHARPE: Just to be clear, is it part of your observation that the numbers that were reported were disproportionate to the numbers that were being shot as well?

Ms SMITH: Yes. One hundred per cent.

Mr KEIGHTLEY: One hundred per cent. Yes.

Ms SMITH: We would get data saying that 350 kangaroos should have been killed—that would be sort of 8½ truckloads of commercial kangaroo harvest—and in the same period there were 90 commercial kangaroo harvesting events. So 10 times as many kangaroos were being shot but no-one listened. Until now. Thank you.

The CHAIR: We have heard from a number of witnesses and quite a few submissions about the cruelty of the non-commercial and commercial industries. Your submission is full of horrifying images of cruelty, so thank you for having the courage to put these in for us but also for doing what you do. I did want to see if both of you could expand upon that work for us in terms of what that means to you emotionally—what it has meant physically and spiritually for you to have to continue to expose and document this appalling cruelty from the images I have seen. You go out there every day to do it. That must take a significant toll on both of you. Would you care to expand upon that for the Committee?

Mr KEIGHTLEY: It does change you. You are never insulated from the cruelty or from what you see but you cannot not do it once you see it. That is why we went to so much trouble. You can see by the work that we do, which is not normal practice to do what we do—to surround ourselves, to go into butchering sites and to pick up heads and examine them and then carry them out and take them to vets. It is a little bit bizarre. We have not got any friends. Nobody invites us to parties anymore because we talk about kangaroo heads.

Ms SMITH: It is not a normal, everyday occurrence for you to walk out your front door and stand in a shooter's spotlight with a rifle aimed at you. People should not have to do that in order to just get heard or justice. But it is a normal occurrence for me. I hear a shot, I see a spotlight, I am out the door, I have got the camera—I need to get evidence because the Government wanted me to do that in order to help me. And yet I provided this evidence over and over again and nobody helped me. But I am not going to stop until it stops.

The CHAIR: Is it difficult for you to identify who is doing the shooting at any given time?

Ms SMITH: Not generally, no. We can usually tell—we can tell immediately, virtually, the difference between a commercial and a non-commercial shooter. We can normally tell by the shape of the vehicle or the characteristics of the shooter himself who it actually is and we can name him. A lot of the time they cover their registration numbers, so you cannot actually get that unless you happen to be out on the road when they leave. When they are actually in the fields they have generally got their rego plate covered but we recognise them. They are only from here to you away most of the time, so you can see their faces.

The CHAIR: You have reported the threatening behaviour and any—that is what you mean when you say you have gone to the police and others? You have reported that?

Ms SMITH: Yes.

The CHAIR: What has the response been from the local police, the local area command?

Ms SMITH: They just keep saying, "That is not possible. You couldn't have seen that. That couldn't have happened. This just doesn't happen. These shooters are telling us they are 800 metres or a kilometre away from you." They are just completely dismissive.

The Hon. MARK BUTTIGIEG: Looking through this departmental report—this is the DPI *2021 Quota Report*. I suppose this is why the statistics are so important. Leaving aside all the deeper issues associated with it, if you look at it purely superficially—to the extent that they are accurate—a layman or person from the public would look at it and say that it says here that in 1975 the population was 3,365,000. Fast forward to the

current day and it is 10,155,000. There have been peaks and troughs in between. But there has clearly been, according to this estimate, a threefold increase in the kangaroo population. I am just playing devil's advocate here. If you accept that the biological limit is 10 per cent and we have got a cull rate here of what looks like about 15.3 per cent, then there is a 5 per cent decline in the population. The people using these figures and tables are going to say that even if that is the case, we are only reducing the population by 5 per cent a year and it has tripled since 1975 anyway. That is presumably what people are going to say when they look at these tables. What is your response to that?

Mr KEIGHTLEY: There is a high reliance on the integrity of the data that produces those reports, and you have heard some evidence about that on Friday.

The Hon. MARK BUTTIGIEG: Yes. It is probably an unfair question but have you got any idea about how inaccurate those figures might be? Is it possible that the population has actually declined since 1975, for example, as opposed to a triple increase?

Ms SMITH: Some researchers say the population has declined.

Mr KEIGHTLEY: It certainly has in our zone, in zone 49. The Government's own data—because they flew over it again and transect. The population has reduced by 50 per cent over the three years. That is a concern. So the kill quota has been reduced but we may have to wait another three years till there is another population analysis, and then what will that result be? I think we need to be a bit more cautious.

The Hon. MARK BUTTIGIEG: Presumably if you are killing the male kangaroos, specifically, disproportionately more, then there could be a point of no return dive in the population. That is part of the point of all this, isn't it?

Ms SMITH: Yes.

Mr KEIGHTLEY: Yes.

Ms SMITH: Even if you just get one or two males that do come back, what is the biological impact of one or two fathers being father to all the joeys? How does that look in 10 years' time?

The Hon. MARK PEARSON: I just want to move to the issue of exclusion fencing or cluster fencing. I understand, Mr Keightley, that you have been and had a look at cluster fencing or exclusion fencing. With your knowledge of the behaviour et cetera of kangaroos, and if you have received any feedback from people in the community where fencing is being erected who look after kangaroos or who have their interest at heart, can you tell us what you think the impact of exclusion fencing on kangaroos is or will be if it proliferates in New South Wales?

Mr KEIGHTLEY: Luckily, there is a lot of information on the exclusion fencing and the cluster fencing in Queensland. The concern that we had was that it would roll down through New South Wales, which it is. I went to have a look at cluster fencing around New South Wales to see what was happening and also to meet with, for support, some friends who are wildlife carers in rural areas. Finding places like the cluster fencing that is at Gilgunnia in western New South Wales, that is noted in the report—22 properties clustered into one property, so to speak, within an eight-foot fence, that is half-a-million acres in size, so 210 kilometres of continual fencing around the Gilgunnia cluster. It was the first cluster that the—it was government money, I believe Federal money, \$560,000, that came down and was delivered through Local Land Services, western division. So, it is public money being used to erect these fences or to subsidise the erection of these fences.

I spent a few days looking around that particular cluster, around the 210 kilometres, and I drove through what is—it is publicly funded if the property owners legally bind together through a contract to make sure that it is one continual fence. So, it blocks everything. Ancestral lines for kangaroos is the biggest concern. I saw evidence of where kangaroos died from impact because they do not believe the fact that there is an eight-foot fence in front of them: barbed wire, dug into the ground, very heavy-duty, robust, impressive fences. That is a problem, but also the other animals that get caught in those as well. It just fractures the landscape. It is a biodiversity nightmare.

The Hon. MARK PEARSON: But we had evidence on Friday from a person who studied cluster fencing. It is the only study that we have so far. He is claiming that not only do the livestock benefit but kangaroos benefit, both inside and outside. Can you understand that?

Mr KEIGHTLEY: No, I cannot understand that. There are a couple of things that I could offer to that point, to speak to. One is that the Government itself, through the Local Land Services, and if you look at—I have the document here, which I have not tabled: Local Land Services, western division, and it is their recommendations for options for integrated kangaroo management in the western region. The western region

Local Land Services is bigger than a combination of Victoria and Tasmania in size, put together. So, Local Land Services make recommendations on how to manage your kangaroos, and one of those is to put up exclusion fencing and to cluster with your neighbouring properties. If I may read from it, it states:

An integrated management approach—

for managing kangaroos—

1. Harvesting or non-commercial culling work best within a ... exclusion fence perimeter ...

So you can get funding to put up an exclusion fence, and then "harvesting" or "non-commercial". The second recommendation is a water point closure, which "is a supplementary control to reduce impact" of kangaroos. So, they close off the water to the kangaroos and then, to reduce your populations of kangaroos to the "desired levels", deploy the commercial harvesting. That is a recommendation by Local Land Services.

What they are doing is, obviously, to decrease the total grazing pressure, to make the maximum amount of every leaf of grass that is within that half a million acres is to fence them in, exclude them from water, and if they do not die from that, shoot them out. If you look on the shooters' and different media platforms, where farmers and other people communicate, there are lots of anecdotal stories—and I have heard from people myself—of helicopter shoots within these large properties. It happens in Queensland, and it has been documented. This is the worry of the rollout of the cluster fencing in New South Wales: If this happens, it will just be a fracturing. There are 4.5 million hectares of cluster exclusion fencing in Queensland.

The CHAIR: We are officially out of time, but I will go to the Hon. Penny Sharpe for the last question.

The Hon. PENNY SHARPE: We had a lot of discussion about the fencing issue, but just to be clear, the fencing also keeps out other predators. There are other native animals that are within the fence that would derive some benefit from fencing. Do you accept that?

Ms SMITH: Fencing is not a natural thing for a native animal, though, is it? So, I am not sure that it actually would benefit.

The Hon. PENNY SHARPE: If they are no longer being eaten by wild dogs, the smaller mammals and those kinds of things that are protected inside the fence—I understand the point you are making about kangaroos because they are actually being shot and harvested, but I am just trying to understand. From where I sit, there would be some benefit, and I know that some work has been happening in national parks, for example, where they are doing predator-proof fencing exactly to do that—to do rewilding of potteros and a whole bunch of other small mammals. I am just trying to understand because you have actually seen these. I have not seen them, so I am interested in whether you think there are other benefits, perhaps not kangaroo-related but in terms of other native animals.

Mr KEIGHTLEY: No. I saw the introduction of goats within that half a million acres, and I have visited other ones in between Moree and Lightning Ridge where a gentleman put up an eight-foot fence 6.5 kilometres each side of the road, pushed out all the kangaroos onto the highway, which is known for road trains, and now he has goats in there, but all the kangaroos fell foul of the road trains. They were all killed; they were all slaughtered. There were only two women up there, who were wildlife carers, who had to deal with the ramifications of that gentleman's actions: remove the kangaroos, introduce goats because he can get 10 times the amount of money.

The Hon. PENNY SHARPE: Thank you, that is helpful.

The CHAIR: We are out of time. Thank you, Ms Smith and Mr Keightley, for everything you do and for your extensive submissions to this inquiry.

(The witnesses withdrew.)

TARA MEDINA, Director, Discovered Wildfoods, before the Committee via videoconference, affirmed and examined

The CHAIR: Ms Medina, do you have a short opening statement to make to the Committee?

Ms MEDINA: It is very brief, as I am aware that the Committee has already reviewed submissions made. Broadly, I am a director of a company that is focused on bringing more sustainable proteins to market for food service and grocery. We find kangaroo and other Australian wild game meats to be really sustainable sources of protein that also are supporting sustainable business models in regional Australia. If there is a way to talk about animal welfare in that context, we also believe that the commercial harvesting industry is held to a really high standard, and that there is an opportunity in this space to address private culling to bring it to a higher standard to support a way for it to become more economically beneficial to private farmers as well.

The CHAIR: Ms Medina, you said in your opening statement that the commercial industry is held to a high standard. We have heard, including from even the previous witnesses, a reasonable amount of evidence that, in fact, there are quite a number of concerning practices on the ground, kind of across the industry, if you like, including both the commercial and non-commercial culling. Could you just explain for the Committee the way in which you found out that the commercial industry is held to a high ethical standard?

Ms MEDINA: Sure. Our business is actually focused more on harvesting invasive deer particularly in southern New South Wales. We were set up a few years ago through a partnership with one of Australia's oldest game harvesting businesses, Wild Game Resources Australia. Because the regulatory framework around harvesting deer was new, both new to Victoria and new to us as business people, it was a process of education to understand what we needed to do to get our harvesters accredited. A lot of harvesters we were working had previously been kangaroo harvesters. So there was a process of learning from them what was normal in the kangaroo industry, from learning from Wild Game Resources Australia and then also seeing how that had translated to the rules around venison harvesting.

What we came to understand is that there is a really significant investment on the part of harvesters to be in that role. There is a time investment obviously in terms of getting the right training and committing to those accreditations, but there is also significant cost in what they have to do from an equipment perspective and in their time—often working overnight in quite challenging conditions. What I observed was that regardless of the type of person who gets into this work and their personal ethical or philosophical views, after investing that time and money resource into becoming accredited it is in their commercial interest to retain a high standard because it is a space that is audited rather than sort of a blank space of what happens with farmers farming on their own property. What they put at risk by not adhering to the standards is their investment in a vocation. So that is what we do.

The Hon. MARK PEARSON: Ms Medina, have you been out on a shoot of wildlife?

Ms MEDINA: The sound is a little bit cloudy, sorry.

The Hon. MARK PEARSON: Have you been out with a kangaroo shooter harvesting to reassure yourself that the high ethical and welfare standards are in place?

Ms MEDINA: I have not been on a kangaroo shoot but I have been on many deer harvests with shooters who came from the kangaroo industry. The area we work in is more southern New South Wales than Victoria, so I have not had as much exposure to going out on wildlife shoots with harvesters, but I have certainly spoken to quite a few of them.

The Hon. MARK PEARSON: Did you see any young deer with mothers in that shoot?

Ms MEDINA: I did not see young deer shot with mothers in those particular shoots, but we do accept there is a wide range of ages of animal in harvesting.

The Hon. MARK PEARSON: Including young deer?

Ms MEDINA: Yes. The youngest deer that—we would see young deer included, yes.

The Hon. MARK PEARSON: Would it be acceptable to you that whenever a female kangaroo is shot that 50 per cent of the time she will have either a young in the pouch or a young-at-foot, or both, and that the young in the pouch is bludgeoned to death and most of the time the young-at-foot runs away and dies from either predation, starvation or exposure? Are you aware that that is actually a fact?

Ms MEDINA: I think what I would be more concerned with is everything that led up to that moment and all the decisions that were made from, like, a regulatory perspective about what areas we should be harvesting

kangaroo in, what we know about populations, who is doing the harvesting, what they knew at the time, what they could see and what decisions they made, because I am sure in every industry or in life in general we can get outcomes that we are not happy with. So it is about what decisions are made up until that point.

The Hon. MARK PEARSON: So do you think 550,000 young animals dying every year is an acceptable outcome, is an acceptable collateral damage of this industry, which you are sourcing from?

Ms MEDINA: I think that it comes to the bigger question of what we are trying to achieve as a nation. What are all the protocols that we have put in place for population control? If we believe that there are areas in which populations are actually starting to become out of control, then a mechanism has to be put in place to reduce them, and if there is collateral damage then there is an emotional level to which that is confronting, but there is also a scientific reality and the challenge of what we do with those resources.

The Hon. BEN FRANKLIN: Thank you so much for being with us today. To me, your business model actually seems like a win-win in that farmers get a new revenue stream, they get ethical pest control and the consumers get a valuable product. First, can you tell us what the market response has been to the sorts of products that you are putting out there?

Ms MEDINA: It has actually been amazing and thanks for your kind words. What we are trying to do is create a win-win business model for everyone that can support regional employment, make harvesting done to a higher ethical standard and reward farmers for it, instead of making them pay for it off their own dime and off their own time. The responses have largely been good because I think that many Australians are not really aware of the availability of really sustainable, from a carbon perspective, proteins in this nation because of the unique scenario we have with vast numbers of overpopulated invasives and also some overpopulated natives.

The Hon. BEN FRANKLIN: Your submission says that the highest risk to animal welfare and effective population control is the lack of regulation of pest control on private properties. I was wondering if you can explain what your views are there in a bit more detail please.

Ms MEDINA: Sure. I think it is a really challenging space to regulate because on the one hand I fully sympathise with farmers who have been under insane amounts of pressure, particularly with the drought, and are just trying to manage their properties to the best of their ability and resources. The decision that was made a few years ago to remove drop tags and make that possibly easier really makes sense when you tie it to the issue of farmers under pressure. But the reality is that if you are trying to manage a population effectively, especially if it is a native population of kangaroo—unlike deer, we are just trying to reduce numbers as much as possible; with kangaroo you actually have to manage them to a suitable level.

By having regulation around the private space you are flying blind on what population numbers are actually doing and what the standard of ethical treatment in private culling actually is. Unless there is some form of audit or some sort of parallel code of practice between the standards we expect from commercial harvesters and the standards we expect from private culling, then you are never really going to have a holistic management system that addresses every population change in the same way.

The Hon. BEN FRANKLIN: And that gets to the next point. We have heard a bit of evidence from people who suggest that they have seen evidence of both commercial and non-commercial killing of kangaroos to be done outside the framework, outside the regulations, done by cowboys, in effect, in some circumstances. My point is: Are you comfortable that the regulations that are currently in place are appropriate and able to be abided by and should be abided by? Do you think that they need to be strengthened in any way? If they were strengthened, if the logistics for compliance were strengthened—for example, the RSPCA has suggested that body cams may well be an appropriate thing to put on hunters to ensure that they are acting appropriately and within the regulations and the guidelines—are those sorts of things that you would be not opposed to?

Ms MEDINA: When you say increased regulation, do you mean of the commercial space or of the non-commercial space?

The Hon. BEN FRANKLIN: Either. I am happy to answer both if you wish. It is up to you.

Ms MEDINA: I think the commercial space as it stands is already at a really high standard. I am not sure, given the conditions under which they work, bodycams would be sort of extremely effective but I appreciate the intention behind it. However, I would definitely welcome any improvement of standards in the private space. Even if it is only to help track population numbers accurately. If an area or zone is deemed to be at risk by the State then it is down tools for the commercial industry and the tagging property allocation system ensures that that is compliant. But you do not know what is happening on private properties. It just makes sense if what we are trying to look at is population control via zones within New South Wales that there would be a similar prohibition in place. I do support increased regulation in the non-commercial space.

The Hon. MARK BUTTIGIEG: You have made the point in your submission and your answer to my colleague's question that you think the commercial space is okay in terms of the regulatory regime. Do you accept that is only possible in terms of reconciling the degree to which that regulation is complied with if there is appropriate monitoring and enforcement? The evidence that we have heard to date is that the regulations might be in place, the training may be in place but what happens in practice is quite different. Can you give us your view on that?

Ms MEDINA: I appreciate the point. Like, you can have speed limits and seatbelt requirements in place for people who drive cars but if there is no-one checking then you are not really sure that that is happening. What I have experienced personally, mainly with deer harvesting and interactions with commercial harvesters, is that the system is robust enough that were it to be audited or monitored more it should be able to stand up. If it reveals bad practices that are currently in breach of those regulations then it would be right to address that.

The Hon. MARK BUTTIGIEG: You say in your submission that there is zero incentive for these shooters to deviate from that. Can you outline for us why there would be zero incentive? What is stopping them from taking shortcuts I guess is the question?

Ms MEDINA: I think that it comes down to what you mean when you say "taking shortcuts". I am saying that there is zero incentive for them to breach rules for which there are enforcement mechanisms. If they take an animal that does not have a tag, they do not comply with the parks' documentation requirements then they will not be commercially rewarded for that harvest. Where there is a compliance protocol in place there is no incentive for them to break it because it is their vocation.

The Hon. MARK BUTTIGIEG: This is probably a naive example but I imagine if you have a quota that you are trying to fill time is money and if it saves time to not shoot to the brain, for example, and shoot kangaroos that are not tagged, if it is not enforced why would you not do it?

Ms MEDINA: A lot of the time that also comes down to what—not the harvesters but the organisation accepting harvests will enforce as well. I know that there are companies out there that do not accept body shot. We do not accept body shot for deer. In that sense there is again zero incentive because a commercial harvester cannot supply the harvest unless they adhere to those standards.

The Hon. MARK BUTTIGIEG: This is an important point. You actually have a process in place where prior to purchasing you will actually examine the body to see if there are any body shots?

Ms MEDINA: We have our own code of conduct for what standards of animal we accept and what we expect harvesters to comply with. Obviously there is a government standard in place but we believe we should have a code of practice amongst our shooters, and we have one, which includes not body shot. We are selling meat to restaurants for human consumption and it does not make sense to take that risk that there could be fragments throughout the body. We accept head shot only.

The Hon. MARK BUTTIGIEG: Okay, so it is a code of conduct rather than a physical check mechanism?

Ms MEDINA: It is a physical check mechanism in the end because we have our butchers bone out the entire animal. If it is not caught in declaration when they deliver it is going to be realised when we start processing. Because each animal is tagged against the shooter's licence and against the company that it came from it is fully traceable who has made the mistake.

The Hon. MARK PEARSON: Have you ever asked why the head is not on the body of kangaroos when they come to the processing plant?

Ms MEDINA: It is not something I am familiar with, why that is a regulation. I know that it is not usable from a market perspective.

The Hon. MARK PEARSON: You are aware though that a head can be shot in the jaw, in the face, in the eyes, in the upper neck and not the brain. You would never know about it unless the head was attached, would you?

Ms MEDINA: Well, we also find that the most common technology that most of our shooters are using in the field is infrared camera technology. They have been quite proud of showing the standards to which they work. We are confident that is what they comply with.

The CHAIR: I have a question from the Hon. Catherine Cusack who has dialled in on videoconference on behalf of the Government.

The Hon. CATHERINE CUSACK: Can I ask if you could provide us with a copy of the code of conduct that your organisation uses? Madam Chair, we probably also need to access the Government's code of conduct as well.

The CHAIR: Yes.

The Hon. CATHERINE CUSACK: My question is if you are not accepting kangaroos that are body shot is there any market that would accept such a kangaroo?

Ms MEDINA: For our sort of business we work with food service restaurants primarily, so it is a standard that we have in place. I cannot speak for the entire industry receiving kangaroo bodies, by-products, meat et cetera. I am not sure whether knackeries or pet food companies have a standard in place around body shot. But, for us, we do.

The Hon. CATHERINE CUSACK: I guess I am just worried about what happens to the kangaroos that do have body shot if they are not able to be—anyway, we will make those inquiries of the people who do the shooting. Thank you very much for your answers.

The Hon. PENNY SHARPE: Just as a follow-up to that. You have spoken a lot about the shooters that you use; they are clearly at the high end in terms of training. What do you require for your shooters to become one of the shooters that you will take product from?

Ms MEDINA: So, when we supply—sort of, after this conversation—our code of conduct, there will be a list and the requirements for registration.

The Hon. PENNY SHARPE: That is fine. Just following on from the Hon. Catherine Cusack's questions, I think that looking at what the Government requires and what you are actually requiring would be very useful.

Ms MEDINA: It is broadly the documents which they need to prove that they are a commercial harvester to be eligible for the activity and a trained sharpshooter et cetera. But then also that they complete our code of conduct and that they have enough references.

The Hon. PENNY SHARPE: Terrific.

The CHAIR: Ms Medina, thank you very much for agreeing to appear today.

Ms MEDINA: Thank you.

(The witness withdrew.)

DOUGLAS JOBSON, Chief Executive Officer, Macro Meats Group, and Kangaroo Industry Association Australia Operations Committee member, sworn and examined

DENNIS KING, Executive Officer, Kangaroo Industry Association Australia, sworn and examined

The CHAIR: Does either of you or do both of you have a short opening statement?

Mr KING: Yes, Chair. I have a statement on behalf of the industry.

The CHAIR: Thank you.

Mr KING: The Kangaroo Industry Association Australia [KIAA] represents about 90 per cent of the commercial kangaroo industry. We welcome the inquiry into the health and wellbeing of kangaroos and other macropods in New South Wales and appreciate the opportunity to appear before this inquiry. The industry is confident in the New South Wales Government's ability to responsibly manage the four species subject to commercial harvesting under the relevant legislation and to develop plans that adapt to changing circumstances and natural disasters. However, we also recognise the need to address concerns in the public domain and clearly distinguish between threatened and non-threatened species, as well as the commercial harvesting, the non-commercial culling and the illegal slaughter of kangaroos.

It is hoped that a fair exploration of scientific evidence and expertise will set the story straight on the need for population management of the abundant species for conservation purposes and the sustainable and responsible role that the commercial industry can play. It is also the view of the industry that, based on scientific research and expert advice, the commercial harvesting does happen on a humane basis. This does not preclude improvements in practices informed through science and expert advice, and the industry is committed to continuous improvement. There are two main issues that the industry wishes to bring to the attention of Committee: First, the KIAA has been long calling for stricter oversight and standards for the non-commercial culling, as well as tighter policing of illegal operations. To this end we would like to see a single code of practice for both commercial and non-commercial. The code should set nationwide requirements around shooter competency, licensing and mandatory tagging and reporting that already exists for the commercial industry.

The reintroduction of drop tags for the culling under a damage mitigation permit and greater policing should be part of the full review of the 2018 changes to non-commercial culling. This could include the exploration of whether there should be an onus on landholders to use the commercial industry first to control kangaroo numbers to ensure the highest animal welfare standards and greater transparency operationally. Associated with this, we also recommend the authority for rangers to enter a property to inspect carcasses that are left. Similar to fishing inspectors, rangers should be able to inspect carcasses and take appropriate action for animals found without tags. There is a need for there to be more rigour in checking into illegal activity and the setting up of a framework that puts more conditions around non-commercial culling.

The second area in which we have made a recommendation is in terms of the use of exclusion fencing. We believe this is of concern to all native species and requires further urgent investigation. A comprehensive study needs to be done into the full impact of fencing on all species, including the migratory patterns. To assist the panel, we have prepared a short pack on the issue of importance to industry for your information. To conclude, thank you again for the opportunity to address this inquiry. We look forward to the deliberations of the inquiry.

The CHAIR: Thank you very much. We will now move to questions from members.

The Hon. MARK PEARSON: Often when it has been questioned as to why shooters are not actually reaching the quotas that are given after there has been a survey to define the numbers that are allowed to be killed, it has been stated that there are not enough shooters and that is why they are not reaching the quota. But, Mr King, you have said to the media that you have abundant shooters. Can you clarify which is actually the case?

Mr KING: I do not recall saying we have abundant shooters, Mr Pearson, I am sorry. When was that?

The Hon. MARK PEARSON: I do not have the detail right in front of me but that was a quote to the media, when asked about this specific question as to why quotas are not being met. But is there another explanation as to why quotas are not being met, if that is not it?

Mr KING: I would suggest—Mr Jobson?

Mr JOBSON: Mr Deputy Chair, we have seen an increase in the number of field harvesters in New South Wales and in the other jurisdictions since the easing of the drought. The reason that the quotas are not being taken is not a simple question to answer. There is a whole range of things that are impacting on the activity on the commercial kangaroo harvest and some of those things may be the effect of drought in areas, the effect of adverse seasonal conditions that have impacted all those things; also the—

The Hon. MARK PEARSON: Excuse me. When you say "impacted", do you mean caused the reduction in the number of the kangaroos?

Mr JOBSON: No, it impacted on the activity that happens. Some of the people who traditionally worked in areas have had to move out to seek other employment and do other things. The other thing that we have seen is the demand or the price that we were paying for the kangaroos does have an impact on the amount of activity that happens in the harvest. Therefore, if we have lower pricing at the gate or at the chiller, that will determine the activity that happens. Conversely, if we have higher pricing, we will have more commercial activity.

The Hon. MARK PEARSON: Is it my understanding that Macro Meats' processing plant closed for two days recently?

Mr JOBSON: No, that is not correct.

The Hon. MARK PEARSON: Reasonably recently? In the last six months?

Mr JOBSON: I am not sure what the question is. We have had, earlier this year, some severe weather conditions in New South Wales and in South Australia, and we are very much like the rangeland stock industry: If we cannot get trucks in, if we cannot get vehicles in, if roads close, that does affect. So we may have lost a day or two because of weather conditions but we certainly are seeing and enjoying good numbers currently. That has happened since we have had more favourable weather conditions and certainly an increased demand for our products.

The Hon. MARK PEARSON: If you are satisfied with the number of kangaroos that are available for the industry, why has there been an application to reduce the minimum weight?

Mr JOBSON: I have not made an application to reduce the minimum weight.

The Hon. MARK PEARSON: My understanding is that the industry has made that application and in budget estimates that was confirmed by the environment department—that there has been an application to reduce the minimum weight, which is questionable. If there is a claim that we have enough kangaroos for the industry to run, why would we want to decrease the minimum weight when you participated in the setting of that weight to keep it as high a weight as possible for a whole series of reasons?

Mr JOBSON: I may be able to put in an idea as to why that did happen or has happened because I am aware that something similar happened in Queensland. The reason for that in Queensland was to encourage the commercial cull, which is seen as the most humane way of reducing the numbers of kangaroos where they need to be reduced. It was seen if they lowered the weight, that would help allow more landowners to move away from non-commercial means to control the numbers. So I would suggest—and I am not aware of all things that happen in New South Wales—that is probably a logical reason why that application was made. We do know that we can take down to a certain weight in New South Wales. After that, the only means to control those numbers to the landowners is by non-commercial means. Given that the commercial industry is seen as the best option and given that the department encourages landowners in the first case, if they have an issue with kangaroos, to look at a commercial option, it probably makes good sense.

The Hon. BEN FRANKLIN: Picking up from that, why would the commercial option be the first option—the best option? If you are thinking of broader animal welfare, for example, why do you suggest that commercial options are better than non-commercial options?

Mr JOBSON: There are a number of reasons as to why the commercial take is seen as being the best option. Firstly, we believe that farmers and landowners and graziers do really have care and affinity for the kangaroos on their property. We also believe that if they did not have to cull or reduce numbers, they would not. They are not doing it for fun. They are doing it because they have to do it for their business and to maintain the requirements under their leases or other things as far as maintaining the flora on their property. They know that the commercial industry is tightly controlled and that we have a group of trained professional harvesters that have to check a number of boxes. In the case of reducing kangaroo numbers where they need to be reduced, there are some benefits. If kangaroos are shot non-commercially and left, it increases the risk of predation. If the kangaroos are left on the ground, it is a shocking waste of a valuable resource and probably shows some disrespect towards the animal itself.

The Hon. BEN FRANKLIN: And what about the environmental conservation? For environmental reasons, is commercial culling helpful there and, if so, can you speak to them?

Mr JOBSON: Certainly we only harvest the four prolific species. Out of the 50 or 60 species of kangaroo, we only harvest the four prolific species. When you have an overabundance of these species, according to the reading that we have done and the science that is out there, it puts pressure on the rangeland of the less

dominant species. There is a real risk of encouraging further loss of species if those four major species are not controlled. The other thing is that we know kangaroo populations fluctuate and, from what we understand, they fluctuate mainly because of rainfall and drought—feed and lack of feed. We know that when kangaroo populations blow up or go to an extreme amount as we have seen prior to last drought in New South Wales, you have, as Mr Pearson said earlier, large numbers of kangaroos that die. There was some evidence given about the population drop by 50 per cent in one of the regions. The reason for that is uncontrolled kangaroo populations. A strong commercial industry will help keep populations at a level so we will not get into a situation where we have an explosion when we have rainfall conditions or other things.

The Hon. BEN FRANKLIN: Thank you. One of the significant, main discussion topics of this entire inquiry has been clearly that there are people—individuals and organisations—who are concerned that people who are harvesting kangaroos, whether for commercial or non-commercial reasons, are acting outside the guidelines, outside the laws and outside the appropriate regulations. From my perspective, it appears that people are more concerned about the non-commercial harvesting than the commercial in terms of people acting outside the regulations and rules and requirements. But there has certainly been some concern about the commercial side in terms of that behaviour, too. I am wondering if you have comments about the rigour with which the rules and regulations are followed from your industry? Is there anything either of you think can be effectively done to increase comfort that those rules are being followed and that as an industry you would be amenable to implementing?

Mr JOBSON: I think to start with, we can all improve. The one thing we find both here and internationally when we speak to groups is that there is a real confusion about kangaroo harvesting. There is a general belief that there is killing kangaroos in Australia. They do not understand that we have a commercial industry that is well managed and well regulated. We have a non-commercial industry that has regulation and then we have illegal activity that has no regulation at all. We see that there needs to be a tightening of the bottom end or the high-risk component and we can also look at the commercial industry on how we can improve. We have heard about the dispatch of joeys and blunt force trauma from the Deputy Chair. We have done research in the past—funded research as an industry through AgriFutures, or formerly Rural Industries Research and Development Corporation [RIRDC]—on better ways to handle dependent young. So there are areas of improvement.

We are currently scoping out a project to use some later research that has been done on captive bolt and if there is a way to improve the current method. There is also a lot of talk and discussion, and we have been having discussions in the industry, about how we can better audit what happens in the field. With technology changing—you were talking about body cameras. They are used more widely now. We have been looking at opportunities to do audits on lights—the lights on the dressing. So, I think, yes, we can improve on the system. The opportunities to improve on the system will be aided by improvements in technology. We are seeing now that on farm there are a lot of things happening using the proliferation of satellites and other technology that is out there. Certainly, I see in the future that the field aspect will be audited via remote opportunity. We can always improve.

Mr King may have a view on a couple of other points, but we have a very strong and rigorous system now. Yes, there is a lot of debate about different aspects, and people have different views on the methods used to calculate populations and trigger points and how we put in factors to mitigate errors or margins. As an industry, we are away from that. That is done by the scientists and the ecologists. We fully support good transparency and improvement in technologies that will give us a better animal welfare outcome and ensure that the industry and, more than the industry, the kangaroo population is maintained and conserved.

The Hon. BEN FRANKLIN: Mr King, did you want to add anything? This is part of the nub of why we are here.

Mr KING: Just in relation to the use of technology, there is some work being done at the moment on an electronic means of tagging and geolocation of where the harvesting is done. I made a suggestion at a meeting just recently of the Kangaroo Management Taskforce of the potential to also use that in place of the drop tags that were stopped in 2018 from being used to actually record the geolocation of any of the damage mitigation permits that were being utilised. That would give further insight instantly on databases as to the number of animals that are being harvested. If the idea of body cameras was put forward—

The Hon. BEN FRANKLIN: Can you just go back? How does the sort of technology you are talking about work?

Mr KING: If it is from the commercial industry, the app will actually record the property, the geolocation where the animal was harvested, who the harvester was, the sex, the approximate weight of the animal. The details are already recorded on a government tag, which eventually makes its way back to the Government, but this would instantly have that information that can assist to provide—if rangers or people were looking to go

and do an audit of a harvester, it would be much easier for them to see the areas where they were working at the time and be in those areas. So, we have no problem with that. We are quite transparent in how good we believe our harvesters are. Sure, there will always be a mis-shot. No-one is perfect; we know that. But the commercial harvesters have a duty of care to go and dispatch that animal immediately. Again, they do not wish to lose their licence by not following through. There is no commercial incentive for them not to do it because that is their business. That is how they make their living.

The other thing is the body cams. I would suggest that industry would consider that. Obviously, there is some money involved, again, in doing all of that, and there would need to be some considerations on how that will work if it becomes mandatory regulation. They have already got a significant investment in their equipment, in their tyres, in their trucks and all the things it takes to go and harvest these animals. There is work being done with the industry to try to also have discussions in the pastoral area to get farmers involved in this whole process of becoming part of the whole industry and getting some recompense as well. There are a number of issues that are being explored continuously, and we are looking forward to further work, as Mr Jobson indicated, in relation to having the—what was the work we are just getting done at the moment?

Mr JOBSON: Captive bolt.

Mr KING: Captive bolt, sorry—a captive bolt treated. We have approached AgriFutures to look at that for the next R and D project that we are going to do. It is not an insignificant investment in that industry. Captive bolt has been looked at previously but with a much different type of a device. This is a similar device that is used on small animals in abattoirs. Again, it is a big investment by the harvesters. It is probably \$700 or \$800 to buy one of those units. But if the science proves that that will give a much better outcome—a more humane outcome for the dispatch of joeys—then that is what we would endorse.

The Hon. MARK PEARSON: Is it your evidence that the commercial harvesters would be completely supportive of wearing a body camera or a camera on the rifle or both?

Mr KING: At this point in time we have not gone round our harvesters. This is all new. This is starting to come around. As an industry, we are keen to look at whatever things that are happening that will improve the outcome. But if it is going to happen for commercial, we just need—again, we are only involved in the commercial industry. I cannot talk for what goes on in the non-commercial side of it.

The Hon. MARK PEARSON: Just on that, actually, when commercial harvesters have gone onto properties, have they reported to either of your organisations their concern about the percentage of brain shot to non-commercially killed kangaroos?

Mr JOBSON: I may speak on that. We have had, since the change of legislation in New South Wales in 2018, a number of people make reports to us, which we have passed on to the department for investigation.

The Hon. PENNY SHARPE: I think I understand this, but I had better check. I apologise if this is an obvious question. The quotas that are provided are set by the Government; is that correct?

Mr JOBSON: That is correct.

The Hon. PENNY SHARPE: And in drought times and those kinds of things, they change. Is that right?

Mr JOBSON: The quotas are based on a number of factors, but the total adult population that they observe during surveys is one of the main drivers of the quota. They have developed the algorithms, which are far beyond my knowledge, that have been tested over time.

The Hon. PENNY SHARPE: One of the things that happens—if we just think about water take from the rivers, which is a highly controversial issue as well. But there are times when the Government basically steps in and says, "Yes, you have this allocation in your licence but, given the current conditions, you are not allowed to take it." Does that happen with yours?

Mr JOBSON: Yes, certainly there are and have been since last year and this year some zones that are either on reduced quotas or the quota has been closed. The Tibooburra zone was closed because of the population counts and other factors. The normal take is 17 per cent for eastern greys, western greys and red kangaroos and 15 per cent for wallaroos if they are allowed to be harvested. The first threshold they will go back to is 10 per cent, and depending on how many standard deviations it falls, if it falls two the take is stopped. That is done by the department.

The Hon. PENNY SHARPE: There are sort of some time triggers? I notice that this is actually in your submission. I have read your submission. How does that happen?

Mr JOBSON: It happens by them closing the zone.

The Hon. PENNY SHARPE: So you just get a notice basically and then you have to tell all your people—

Mr JOBSON: We will be told. Normally it happens from 1 January on a calendar year basis if a zone has been closed. There have been, many years ago, cases where zones have been closed because the numbers have been reached and the zone was closed in, say, November and never—

The Hon. PENNY SHARPE: Given bushfires and those kind of things, has there been intervention in an area? Obviously in Western Division it is slightly different; they were not all closed there.

Mr JOBSON: Yes. Certainly in 2019-20 when we had the terrible fires there was a lot of work done by the department looking at the impact of the fires on all native species but particularly the harvest. The fires happened predominantly along the east coast where there was very little commercial activity.

The Hon. PENNY SHARPE: And that remains the case. Most of the commercial activity is not on the eastern side.

Mr JOBSON: That is right. But what they did do, in answer to your question, was that we were advised that they were stringently monitoring the tags that were issued and the take in those areas that were affected by the fires.

The Hon. PENNY SHARPE: I have one more question. Obviously it is in the industry's interest to keep a healthy population of kangaroos so that you can continue to harvest. You may not be able to answer this, but is there capacity for a greater take, in your view?

Mr JOBSON: Firstly, I think, yes, it is in the industry's interest, but I think it is in Australia's interest to maintain a healthy population of kangaroos.

The Hon. PENNY SHARPE: Sure. I was not being rude about it.

Mr JOBSON: But when I look at the commercial take—and we know the commercial take is correct because there is rigorous and stringent reporting about that—we have a real opportunity to transfer from the non-commercial take to the commercial take. The kangaroo industry employs some 3,000 people. It employs a lot of people in rural and regional towns. We have all types of people work within our industry, including Indigenous Australians. We have people who are helped to stay on properties and on the land because they can supplement their income; it helps people stay in regional areas. We see there is a real opportunity if we manage it properly to grow the commercial industry, which will benefit not only the economy of New South Wales but the animal welfare outcome for the kangaroos, and it has got to be a win-win.

The Hon. PENNY SHARPE: Just to be clear: You see most of that growth would be transferring the culling operations on farm from unlicensed to licensed commercials. That is where you see the greatest growth?

Mr JOBSON: I see that as the major growth area.

The Hon. PENNY SHARPE: I am sure it is probably in all of the papers we have got—we have had over 400 submissions, I am sure this is in here somewhere—and if you do not know this it is okay; it is not a test, it is literally I just think you might know the answer: commercial is what percentage of the kill of kangaroos compared with non-commercial? Do you have any sense of that?

Mr JOBSON: I cannot say. We are not given the non-commercial numbers. We are given the commercial take but we are not given the non-commercial numbers, nor do we know what the illegal take is.

The Hon. PENNY SHARPE: No, I accept all of that. Thank you.

The Hon. MARK BUTTIGIEG: I have just a couple of questions. One is a follow-up to my colleague Mr Franklin's question regarding the technology. I just want to get it clear how that app situation would work. How does the input data get transferred to the Government? Where does the input data come from?

Mr KING: This app operates on an ordinary cell phone. When it is back in action it will have a communication protocol, which will download the data back to the department.

The Hon. MARK BUTTIGIEG: But where does the data originate from?

Mr KING: The harvester at each shot will enter the data.

The Hon. MARK BUTTIGIEG: I see. You have got to manually enter it.

Mr KING: His basic data will be in there, the tag number will be allocated against the next tag that is available because that data is all pre-entered into the app before you start. This has not been developed yet, but this is—

The Hon. MARK BUTTIGIEG: Is it being trialled?

Mr KING: There is work in progress in Queensland, in Longreach. The company up there has got an app being developed at the moment in conjunction with the traceability grant that they were able to get hold of from the Federal Government.

The Hon. MARK BUTTIGIEG: I just want to ask one more question about some of these quota figures. I have a document here that was tabled previously from the Department of Planning, Industry and Environment, the 2021 quota report, and it gives you stats on the total population, quota, percentage of population, which is quite helpful, on the red and grey kangaroo annual population estimates. Then in your document that you tabled, the Kangaroo Industry Association Australia facts, it says the industry has not negatively impacted populations. Then you have got a graph with population estimates, harvest quotas and takes, which is a similar sort of portrayal to the table in the DPIE document, and it actually says it is for harvested species. So whereas the DPIE document covers what looks like two—that is, the red and grey—your document covers four. So obviously you get higher figures in your document, and in fact they are much higher. Just to give you an example, in 1981 your graph says the population was about 20 million; in the DPIE document it says the population was roughly 14 million, but that is obviously going to be less because there are only two species as opposed to four. Is there any reason why you have chosen to—

Mr KING: Those figures are national figures. We compiled it across the whole of the industry in Australia. So those figures have been taken nationally.

The Hon. MARK BUTTIGIEG: So you got that from the environment website, the Feds' website.

Mr KING: Correct.

The Hon. MARK BUTTIGIEG: Which covers four species across the whole nation as opposed to the DPIE one, which is two species for the State. Is that right?

Mr KING: The State is actually three. There are eastern greys, western greys and the reds. There has not been any wallaroo harvest in most recent times.

The Hon. MARK BUTTIGIEG: Okay. All right. Thanks.

The CHAIR: I just wanted to delve into that a little bit more in terms of those numbers, just to understand. The quota document that my colleague was just referring to, the quota report, the 1975 numbers which you quoted before, you are aware of them, and then there is the 2021 numbers, which are some degree higher than 1975—what is the reason for that?

Mr KING: In our submission I believe that we have that similar graph.

The CHAIR: Your submission, not the document you just presented?

Mr KING: Yes, in our submission. So 1975, and then you are saying the following year it went up, which it did.

The CHAIR: I think it was the year—I am just going by what Mr Buttigieg said—which went up to 10 million or something.

The Hon. MARK BUTTIGIEG: The DPIE document has the base population as 3,365,300—that is 1975—and then if you go right through to the current time—well, last year—it is saying it is 10,155,000.

Mr KING: Yes. Ten million, correct.

The CHAIR: Thank you. I could not find that quickly, those exact figures. But what is your view, Mr King, in terms of that increase in numbers then?

Mr KING: Thanks, Chair. This is based, of course, across a long period of drought and wet seasons. If we look at the graph, you will notice that every time there is in the blue colouring a significant increase in the numbers, or even where it is grey, where it is standard conditions, you will get an ongoing increase. Where it returns to orange, which is the average dry, you will see a quite significant drop in the numbers.

The CHAIR: Are you saying that is this kind of boom and bust thing we are hearing in terms of the conditions of rain and drought?

Mr KING: Correct.

The CHAIR: Sorry to interrupt you; the time is quite short. Does it have anything to do with the fact that in 1975 the numbers reported were just the western zones?

Mr KING: No, I do not believe so because again that is one of our main harvest areas.

The CHAIR: Would it have nothing to do with the fact that Northern Tablelands was added as well in 1991? I have information in front of me of different times at which different zones were added. The 1975 figures were just the western zone, right?

Mr KING: Yes, the western zone, which is arguably one of the biggest areas, of course.

The CHAIR: But if you could just confirm that this is the case, that Central Tablelands, for example, was added in 2008?

Mr KING: I do not have that actual fact in front of me.

The CHAIR: This is what we are needing to examine though today.

Mr JOBSON: Can we take that on notice?

The CHAIR: That would be very helpful. I have in front of me, and can you just confirm, that in fact Northern Tablelands was added in 1991, south-east New South Wales was added in 2004, and the Central Tablelands was added in 2008? It is important, is it not, to be clear in terms of what we are dealing with. That might not just represent the sustainability of kangaroos if we are adding all these additional areas all the time.

Mr KING: A valid point.

The CHAIR: If I could just turn to a statement that the former president of the Kangaroo Industry Association of Australia, John Kelly, made in 2017. He made this statement:

The general volume of exports increases at least 10 per cent per annum. That's a pretty significant ... healthy growth.

Ray Borda, the CEO of Macro Meats—is he still the CEO of Macro Meats?

Mr JOBSON: Yes, he is. Sorry, he is not the CEO. I am the CEO. Ray is the managing director of the Macro Group.

The Hon. PENNY SHARPE: And you are the general manager?

Mr JOBSON: I am the CEO and I have just got demoted, thanks.

The CHAIR: We do not mean to use this inquiry to do anything of the sort, Mr Jobson.

Mr JOBSON: No, good. Thank you.

The CHAIR: In 2017 Ray Borda said that over the last 10 years consumption of kangaroo meat domestically has grown about 500 per cent. After commenting in 2011 that they cannot get enough product to supply their existing market he said the demand is there, it is high but the industry cannot keep up with the demand for manufacturing meat. Is that still the case?

Mr JOBSON: Sorry, the question is in 2011 he made—

The CHAIR: The question is can you keep up with the demand that is out there for kangaroo meat at the moment with the number of kangaroos that your commercial harvesters are killing?

Mr JOBSON: We would like more kangaroos and more meat.

The CHAIR: You are not able to meet the demand that is out there now in the consumer kangaroo eating world, is that correct?

Mr JOBSON: We could handle—

The CHAIR: The industry—you, could sell more kangaroo than you are harvesting?

Mr JOBSON: That is correct.

The CHAIR: Was a decision made recently to move from just killing male kangaroos to female kangaroos as well? Was that because of the demand that the industry cannot meet?

Mr JOBSON: Absolutely not, absolutely not.

The CHAIR: What was it for then?

Mr JOBSON: That is a good question. The Deputy Chair would be aware that we had a male-only policy. We met and discussed it. The reason for that was on a couple of levels. One was the old code was fairly clear that you should avoid female kangaroos with obvious dependent young. In 2012 we took a move to move away from a balanced cull to a male-only cull. In 2017 there was a review of the code of practice for humane

slaughter of commercial kangaroos that was started. At the initial meeting we were—I was—strongly attacked by a number of people who felt that we would be far better moving to a balanced kill because by our decision not to take female kangaroos we were then leaving the female kangaroos to be slaughtered by people who may not have had the training or understanding to do that. We had a very strong representation from a couple of groups and after about six months we took the view that we would adopt the Trudy Sharp methods that were going to be put in the new code and the standard operating procedures and we would then ensure that anyone who harvested female kangaroos was aware of the requirements and actually had to complete a questionnaire to show that they had the understanding and the ability to implement the SOPs.

The CHAIR: Okay.

The Hon. MARK BUTTIGIEG: I have a question related to the previous answer. The demand for meat is outstripping supply is what we have heard. Do you have any idea of the proportion of the export market vis-a-vis the total market percentage? What percentage of that excess demand is made up of exports?

Mr JOBSON: I could not answer that. I can take it on notice and look at it. As you would be aware, as everyone here is aware, we are still fighting our way out of the pandemic and we are still struggling with freight and other issues.

The Hon. MARK BUTTIGIEG: International relations, yes.

The CHAIR: Just to be clear, from what you have just said, Mr Jobson, the reason that the code was changed, as I understand in the Kangaroo Management Advisory Panel [KMAP] minutes No. 31, the new code in 2020 to allow commercial shooters to shoot female kangaroos was that non-commercial shooters are too cruel, do not shoot them properly and leave the joeys?

Mr JOBSON: No, I did not say that. I explained to you and I can go back to the start. In 2017 there was a meeting where we discussed the code. In 2017, in December, we were in the middle of an extreme drought. As a result of that drought there was the need, real or perceived, to reduce the numbers of kangaroos in agricultural areas. They were having a severe impact. It was put to us that the commercial industry, by not taking female kangaroos, was adding to the suffering and having an adverse effect on the female kangaroos and the dependent young. It had nothing to do with KMAP.

The CHAIR: I understand there are skin shooters and meat shooters, is that right, within your industry?

Mr JOBSON: No, that is not right. There are no skin shooters in New South Wales.

The CHAIR: So there are no shooters that are only skin shooters in New South Wales?

Mr JOBSON: That is correct.

The Hon. MARK PEARSON: Is it not the case the female kill was ceased because of international pressure regarding what is called the Achilles heel of the industry, and that is the joey? Is that not the main reason the industry stopped killing females—to avert that criticism and concern internationally?

Mr JOBSON: At the same time in 2012 there were a number of things that were happening. Yes, there were international markets that were opened and closed, as we recall, but we were also in the situation where there were reviews happening into the best way to deal with dependent young, and that was including studies of captive bolts and other things. So again, there was no one event; there were a number of events.

The Hon. MARK PEARSON: Did the farmers say to you, "Look, when I engage a shooter, a harvester, to come onto my property, I am not engaging one that just kills males. They've got to kill the lot or I'll do it myself"? Was that the concern?

Mr JOBSON: No, they certainly never said it to me. I cannot say if they have said it to any of the people who harvest for us.

The CHAIR: We do have submissions to that effect.

Mr JOBSON: Well, that is right; you may have submissions, but I can only tell you the truth—that no farmers have said that to me.

The CHAIR: I am afraid we are out of time. Thank you very much for appearing today.

(The witnesses withdrew.)

(Short adjournment)

RICHARD KINGSWOOD, Director, Conservation Branch, National Parks and Wildlife Service, Environment, Energy and Science, Department of Planning, Industry and Environment, affirmed and examined

ROBERT QUIRK, Executive Director, Park Programs, National Parks and Wildlife Service, Environment, Energy and Science, Department of Planning, Industry and Environment, affirmed and examined

SHARON MOLLOY, Executive Director, Biodiversity and Conservation Division, Environment, Energy and Science, Department of Planning, Industry and Environment, affirmed and examined

SONYA ERRINGTON, Acting Director, Environmental Solutions, Environment Protection Authority, Department of Planning, Industry and Environment, affirmed and examined

TERRY BRILL, Senior Team Leader, Kangaroo Management, Environment, Energy and Science, Department of Planning, Industry and Environment, affirmed and examined

The CHAIR: I welcome our government witnesses. Do you have an opening statement to make to the Committee?

Ms MOLLOY: Yes, I do, and I will do that on behalf of the Environment, Energy and Science group. I will ask my colleagues from the National Parks and Wildlife Service to add anything that I may miss. Is that okay?

The CHAIR: Of course.

Ms MOLLOY: Thank you very much to the Committee for inviting us to give evidence this afternoon. As the New South Wales Government, we have a statutory obligation under the Biodiversity Conservation Act, the BC Act, to ensure ecologically viable populations of kangaroos in New South Wales and works to maintain ecologically viable populations through the commercial kangaroo management program and management of non-commercial culling licences. We do that in a number of different ways and I will outline some of that and a lot of it may get sort of discussed this afternoon. We work under a very tight legislative framework, not only under the BC Act but under the Environment Protection and Biodiversity Conservation [EPBC] Act which is the Federal legislation in terms of development of a wildlife trade plan, also the Prevention of Cruelty to Animals Act and the Firearms Act. There is a lot of interaction with different pieces of legislation that goes towards helping us to manage commercial and non-commercial.

We also have a number of codes, plans and guidelines and there is a national code of practice for humane shooting. There are annual surveys. There is a harvest plan that sits from 2017 to 2021 and that is under the process of being redone at the moment. We have annual quota reports and we have annual reports on what we have done, and most of that should be on our website, once it gets approved by the relevant internal approval processes. We also consider that we have good governance around the program. We have the Kangaroo Management Advisory Panel. There is also a task force. We have internal governance as well within Environment, Energy and Science [EES] and the wider DPIE in terms of approving various documents and guidelines with a stringent assessment of what we do as a program.

We also work very closely and collaboratively with the other relevant agencies: the police, the Local Land Services, the Food Authority, the RSPCA and the Department of Primary Industries. In terms of licensing and conditions, we have lots of those—tags, rules, things have to be returned. There is a considerable amount of data that we have collected over the last 45 years. We have a really robust system for collecting all that data and issuing tags in a wildlife management system and, as I have said, we have regular reporting. We try to get as much of that up on the website as possible.

We also have a risk-based compliance approach to how we do both our administrative compliance but also our operational compliance out in the field—compliance policy, prosecution guidelines and then a range of compliance and actions and things that we have at our disposal for people who breach legislation, such as advisory warning letters and penalty infringement notices. Obviously a big part of what we do in the compliance space is around education. In the Saving our Species space, where we do have macropods that are listed as threatened—obviously that is a separate program. A good example of that would be brush-tailed rock-wallabies. In conclusion, we operate a program that has been around for decades. It is continuous improvement. We base our decisions on the best available science and data. We are lucky that we have got as much data as we have. I might leave it there and invite Mr Quirk if I have missed anything there or if he would like to add anything.

Mr QUIRK: I have nothing to add. I think that was thorough. I am happy to take questions.

The Hon. MARK PEARSON: Thank you all for coming in and for the one summary speech at the beginning. From reading your submission, I conclude that you do not foresee that there is any threat at all to

macropods, even though you mention drought, climate change, urban development, commercial industry and non-commercial industry. You conclude that not only are there no threats posed by these, but in fact that kangaroos benefit from the aforementioned issues. Is that correct? That is in your submission.

Ms MOLLOY: I think—

The Hon. MARK PEARSON: It is quite remarkable, so that is why I needed it confirmed.

Ms MOLLOY: As I described in my opening statement, there is a lot that goes into how we manage the commercial and the non-commercial kangaroo management programs. One of the things that I think is pivotal to how we manage the program is the surveying that we do to make sure that the population remains ecologically viable. There are annual surveys in the western zones and triannual surveys on the tablelands.

The Hon. MARK PEARSON: Before you get to that detail, are you willing to confirm that statement that there is nothing to worry about?

Ms ERRINGTON: May I take that, Mr Pearson? There certainly are identified threats to species—climate change, fire, flood, drought being many of them. What we do is we manage the populations for ecological sustainability. We rely on surveys to determine to make sure that the welfare of the kangaroos is sustainable across the State. We use the best available information to help us do the quota settings, which can be adjusted and has been adjusted to recognise and acknowledge the impacts of drought, for example.

The Hon. MARK PEARSON: When you say "best available" in terms of the methodology used to calculate the populations for broadscale wildlife, how could you call it the best available when the methodology used and recommended by the University of Adelaide—it is used in South Africa, the United States and other countries—is actually the use of drones? That is now considered to be—and we have had evidence given to point to that as well. It makes sense: Drones can fly as low as 10 metres above the ground and can have highly sophisticated vision and calculating capacity. Why haven't we deployed drones in these calculations?

Mr QUIRK: If I can just pass one comment, I have been watching the conversation with drones closely. We do not use them for kangaroos that I am aware of but my only reflection I could offer is that we are using them for deer and for horses in Kosciuszko at the moment—experimenting with them. The biggest gap I would see in terms of a population scale survey for the size of New South Wales is scale. Most of the drones that are flown commercially are limited by line of sight. They are very good at small-scale, intense surveys, but in terms of the scale of the surveys that are done in western New South Wales there would be no drone that could do it in any sort of time frame that was achievable. They are much slower and you are limited by visibility about how far you can fly them, particularly over private property and farmland, and particularly at the heights you are talking about. I do not think—

The Hon. MARK PEARSON: South Africa and the United States are not small countries and do not have small national parks or grazing lands. Why would they be choosing drone technology over planes or helicopters?

Mr QUIRK: I cannot comment on what they are doing in other States. I just know in the work that we are currently doing, not around kangaroos but with other species, I have not been offered a technology that would work at that scale.

Ms MOLLOY: The best available expert, scientifically based advice that we have is the use of fixed-wing aircraft in the western zones and helicopters in the tablelands. That is not to say as part of—I made a comment around continuous improvement in terms of what we might do in the future. We are constantly looking at new technology and what might be available to us in the future but at the moment the best available advice to us, and the robustness of what we do over that large an area, is what we currently do to collect that information.

The Hon. MARK PEARSON: With the methodology that is being used—I am just looking at the report that we were given to us recently. The *2021 Quota Report*. In table 17 in relation to Tibooburra, at 2020 the population is estimated at 6,859. That is last year. The density is 0.1 per cent. Then there is a percentage change—I imagine that is the correctional factor—of minus 86 per cent, therefore giving a quota of 6,782, leaving 77 kangaroos. Is that acceptable as a quota? To lose—

Ms MOLLOY: My colleague Mr Brill may be able to comment on that.

Mr BRILL: Thanks for your question, Mr Pearson. You are actually misinterpreting the table. The quota of 6,782 is based on the 2019 population of 48,502.

The Hon. MARK PEARSON: So who counted the 2020 number of—

Mr BRILL: The year 2020 was counted in June-July 2020 and will be the basis for the 2021 quota, which should be inserted in there. It is zero because the population is low. So it is inserted in there. It is actually zero.

The Hon. MARK PEARSON: Whereabouts?

Mr BRILL: It is zero. The quota for 2021 is zero.

The CHAIR: How was the population in Tibooburra—how did it get to the figure of 6,859 by 2020 if it was 450,000 in 2016?

Mr BRILL: Drought. Long-term drought.

The CHAIR: Why was there a quota given then if it was drought and if you knew, for example, by 2020 that there was only going to be 6,859 kangaroos as a result of drought? We knew that we were in drought in 2018. We knew that we were in drought in 2019. Why were kangaroo quotas given when you knew that the population was going to plummet and eventually reach almost zero as a result of that drought? How do you take drought into consideration?

Mr BRILL: Clearly no-one knew that the drought was going to be as severe as it was. The way the quota setting works is that we look at the long-term mean and then we look at the variation away from the mean. If it is a large variation away from the mean, then the quota is set at zero. In statistical terms it is two standard deviations. If it is between 1.5 and two standard deviations from the mean, the proportional quota is reduced to 10 per cent of the population. So the proportional quota system reacts to the falling quota but it does not pre-empt it.

The CHAIR: It looks like you are reacting a bit too late to that falling quota though, doesn't it? I mean, you are down at zero at the moment. It does look like you are reacting way too late to everything kind of screaming at you that kangaroo numbers are falling very quickly.

Mr BRILL: I believe the proportional population quota setting method works really well. I think the history is in the—

The CHAIR: Is this a demonstration of that then—the Tibooburra graph? Is that the demonstration that it is working really well?

Mr BRILL: That is grey kangaroos in Tibooburra?

The CHAIR: That is right.

Mr BRILL: Yes, that is right.

The CHAIR: So for the grey kangaroos in Tibooburra how is it working? Not very well? They are zero.

Mr BRILL: No, the quota is zero.

Ms MOLLOY: The quota is zero because of the impact that the drought has had on the population.

Mr BRILL: The population is not zero.

Ms MOLLOY: The population is not zero.

The CHAIR: Is it not? The population in 2020 was 600,859 and the quota was 600,782. Am I reading that incorrectly?

Mr BRILL: The quota in 2020 is based on the 2019 population.

The CHAIR: What do you think the population in 2021 is going to be then? Why is there not a figure there? Is it because we have not counted it yet?

Mr BRILL: It is because we count them in June-July each year.

The CHAIR: Do you think it is going to be higher?

Mr BRILL: I cannot speculate on what it is going to be.

Ms MOLLOY: We will know shortly.

The CHAIR: That is a worry though, is it not? That is a worry that you cannot—

Mr BRILL: I am not going to speculate in this forum what that will be.

The CHAIR: I think the graph speaks for itself.

The Hon. BEN FRANKLIN: We have got some time this afternoon, so I have a few agenda-setting questions. Could you start by explaining to us what we have learnt about the impact of drought, fires, floods and so on on kangaroo populations in the recent months and years?

Ms MOLLOY: I can certainly talk a little bit about the impacts of the drought and one of my opening comments around the fact that we have got data over 45 years. There has been quite a few periods where you can see that boom and bust following drought and floods with kangaroos over the years. It is a great asset to us to have that information so we can know what the population is doing. Immediately following a drought there is a period of boom and there is a period of bust obviously with drought, and that is what kangaroos have gotten used to over millions of years. They have a great ability to a lesser or greater extent, depending on the species, to cope with that drought and they are able to move around the landscape. One of the things that we are very conscious of, which goes to the previous question, is the importance of—particularly out in the western areas—those annual surveys and being able to put a quota on a population and keep monitoring that on a yearly basis, but also to suspend harvesting if the population drops below certain thresholds. We have got that ability to do that as well.

In terms of the fires, the fires predominantly—as everyone knows—were along the eastern seaboard and in the tablelands area and did not impact as much in the commercial kangaroo zones. In terms of how we deal with fire—I will pass on to my colleague in parks in a moment. Immediately following those bushfires there was a lot of activity and the immediate bushfire recovery plan that we put out. It was all hands on deck, particularly to try and protect our threatened species but also more broadly. We also recently, about a month ago, released our medium-term recovery plan. We are on a constant watch, if you like, over our native species and our threatened species around recovering from fire, but also seeing the impacts of the drought that has broken knowing that potentially we could have another drought in another couple of years. We are constantly keeping up to speed with the science in that area and also the data and the intel on the ground from our stakeholders. Mr Quirk, I do not know if you want to add any more in terms of fire.

Mr QUIRK: There are two things to the Committee I could respond with. One is—again, it is always dangerous to answer questions you are not being directly asked. The survey does not survey parks. So when they do the kangaroo surveys, it is surveying farmland. But Sturt National Park is over 100,000 hectares and Richard Kingsford at the University of New South Wales has got the Desert Ark project running up in the park. They have been keeping a very close eye on kangaroo numbers in that park. Richard made the comment that the numbers in the park where there is no shooting and no culling dropped 98 per cent in that last tail end of 2019-20. We did face the worst drought and, more so than drought, it really is what led to the fires. We had the greatest moisture deficit in terms of soil moisture and vegetation change that Australia has seen in its post-contact history. We have only got a very short window in understanding the Australian landscape, but the moisture deficit caught everybody out.

The Tibooburra numbers do not surprise me because Richard Kingsford was talking to us about what was happening on park. We went from about 200 kangaroos per hectare to two in that last six-month period. That was moisture stress. It was all about stress. That is really what led to our significant fire event. The issue for us around fire is we are doing an inordinate amount of survey work—probably the best—and it is sad that it took a tragedy to do it, but there is more effort going into post-fire monitoring after this fire event than I have seen in my 30 years in the parks service. One of the things that is being looked at is particularly the density of macropods and what numbers are occurring. We have had brushtails and some of our rarer species do quite well. I have got no published data, but some of the preliminary data suggests that some of the larger macropod numbers do seem to be down. That is something we are looking at very closely.

We have looked in those areas where we issue—the commercial side of the business is handled by the Biodiversity Conservation Investment Strategy [BCIS]. National Parks and Wildlife Service manages the economic harm component, which is really a non-commercial component. We have taken a very cautious approach about any non-commercial permit requests in the Eastern Division in those areas where fires occurred and they are all being subject to site inspections and checking. Interestingly, we are not getting a lot of applications. In response to fire, we are looking very closely at any issuing of licences for non-commercial harvesting in the Eastern Division in those areas around burnt landscapes because we are still coming to terms with what has happened. But my understanding is our numbers of requests are not that high at this stage.

The Hon. BEN FRANKLIN: Could I move back to the drought just for a moment. In your submission it notes that kangaroos can actually accelerate the onset of drought. My question is: Is there evidence that actually happened in the most recent drought and, if so, what management strategies were put in place and/or should be put in place to manage this impact?

Ms MOLLOY: I might ask one of my colleagues to comment on that if they can.

Mr BRILL: Certainly the grazier colleagues, or grazier stakeholders, that we deal with have reported that. We do not monitor pasture and we do not declare drought, so you would really have to refer that to DPI who do that.

The Hon. MARK PEARSON: Did they tell you how the kangaroos contribute to the drought and what they actually do that contributes to the drought?

Mr BRILL: No, what I was referring to was that they said that they believed that kangaroos accelerated the onset of drought. I guess it is from their perspective.

The Hon. BEN FRANKLIN: Finally in this round, can I go to a perennial issue throughout this inquiry which has been the suggestion that kangaroo populations can only increase physiologically by 10 per cent per year. Is that the case and, if so, how does it work from here? If you are saying we have only got 2 per cent left in Sturt National Park, what happens with the populations into the future? Or do you disagree with the premise that 10 per cent is the number?

Mr BRILL: I disagree with the premise that that is a maximum reproduction rate. I would like to see the calculations and figures around that so that I can better understand the claims that are being made. But I disagree with that as a maximum rate.

The Hon. PENNY SHARPE: Just to stop there, we have had a couple of examples in the submissions. Could we provide them to you for you to come back to us on notice in relation to that?

Mr BRILL: Happy to do that.

Ms MOLLOY: Happy to do that.

The Hon. BEN FRANKLIN: What do you think the maximum rate is?

Mr BRILL: I do not know what the maximum rate is. I would not speculate.

The Hon. PENNY SHARPE: I just wanted to ask a quick question. Ms Molloy, you said in your opening statement—and I noticed it is in the submission as well—about moving away from the description of "ecologically sustainable populations" to "ecologically viable populations". Why has there been a change?

Mr BRILL: The concept of sustainability is a concept that should be used around a use of something—you have a sustainable use of something. Whereas we are managing to an ecological viability of the population independent of the use. You might think it is semantics—

The Hon. PENNY SHARPE: No, I know that these things are chosen very carefully, which is why I am interested because I have not seen the change before.

Mr BRILL: It was chosen very carefully and it is really around the fact that "sustainable" is really a term that is used associated with the use of something.

The Hon. PENNY SHARPE: So, for example, sustainable you think is more, if we are talking about commercial harvesting, that there is a sustainable population for that as opposed to actually just a viable population that ensures that these species survive. Am I understanding that right?

Mr BRILL: I would express it as a sustainable harvest or an ecological viable population.

The Hon. PENNY SHARPE: Obviously, it is very clear how many kangaroos are killed for commercial harvest. Do you have the figures for non-commercial culling? Obviously, it is the responsibility of the National Parks and Wildlife Service. There are licences given and particularly now that tags are not required—I suppose my question is what percentage of the killing of kangaroos is non-commercial? Can you provide those numbers to the Committee? I apologise if they are somewhere in our material, but I have not been able to find them.

Mr KINGSWOOD: It is probably not in the material because it fluctuates. It depends on the species and it depends on the zone that we are looking at.

The Hon. PENNY SHARPE: Could you give species/zone figures perhaps for the past five years on notice? Not now, obviously.

Mr KINGSWOOD: On notice we could, yes.

The Hon. PENNY SHARPE: We are trying to get a handle on how much is commercial and how much is not, because obviously for this Committee one of the big issues that people are concerned about is the welfare of animals and humane killing of them. Someone suggested that they cannot be humanely killed. But, generally, we are just trying to get a handle on that. We are obviously interested also in the industry. We have just had

evidence from the industry this afternoon that they believe the industry could be grown, but they actually see the biggest growth from those already being killed. But we just do not have a sense of how big that number is.

Mr KINGSWOOD: We can provide that for the last couple of years for you.

The Hon. PENNY SHARPE: That would be great.

Mr KINGSWOOD: It will also depend on the time of year and the year in relation to things like drought and impacts as well. So it becomes a very complex picture, but we can provide the figures.

The Hon. PENNY SHARPE: Yes, I know. The point, I suppose, is that it is clear that there are very clear pathways and requirements for the commercial activity. The concerns around animal welfare—and they have been expressed in numerous different ways over the course of these hearings—are that the non-commercial killing is being done by people who are not professionals and who are not necessarily actually required to reach the same standards in terms of animal welfare. They are doing their best to control animals on their properties. I am not trying to cast aspersions on farmers trying to do their job and manage their land, but we are just trying to get a grip on that so that we can look at it from the animal welfare aspect.

Mr QUIRK: We can take that on notice and get that data back to you. In the commercial zone we often recommend to farmers a range of options, but one of the options we suggest to them is that they use commercial harvesters for that very reason.

The Hon. PENNY SHARPE: Are you able to provide the Committee with the number that take you up on that?

Mr QUIRK: I do not think we would have that data, but I will take it on notice and see if we do.

The Hon. PENNY SHARPE: How many monitoring and compliance officers do you have to oversee the commercial and the non-commercial killing of kangaroos? That is probably a question for each of Mr Brill and Mr Quirk, I think. Or maybe Ms Molloy?

Ms MOLLOY: Yes, I can answer from the commercial end of the business, but there are also crossovers. We have got approximately 40 staff in our regional compliance teams and they, as you know—

The Hon. PENNY SHARPE: Is that just for kangaroos?

Ms MOLLOY: No, they deal with all the compliance that we do across the number of pieces of legislation. But they are all authorised officers, so they can do work in any of those areas. I do not know off the top of my head, if I had to pick a number, how many specifically do kangaroo compliance work. We also work closely with our parks colleagues, if they need assistance. There is also, for the more sort of egregious cases or bigger cases, the specialist investigation unit people as well.

The Hon. PENNY SHARPE: Yes, I am familiar with that.

Ms MOLLOY: Yes, so that would be extra numbers. Can I work out a number? I probably could. I could probably take that on notice, yes.

The Hon. PENNY SHARPE: If you could just take that on notice and if you could also actually give us the figures for the number of complaints and the number of actual actions that have been taken as a result. The serious end, I think, is quite obvious.

Ms MOLLOY: Yes.

The Hon. PENNY SHARPE: We have had lots of very distressed wildlife carers who believe that they have made reports both to the commercial and non-commercial—I am coming to you too, Mr Quirk, on the National Parks and Wildlife Service—but there is just no action taken as a result of what appears to be quite significant deviations from the rules and regulations under which they are supposed to be operating.

Ms MOLLOY: Okay. If we get any calls in through the Environment Line or to any of our officers they are certainly acted upon and put into our database and acted on.

The Hon. PENNY SHARPE: Could you give us perhaps the last five years' numbers on that?

Ms MOLLOY: Yes, and I think—correct me if I am wrong, Mr Brill, but I think in our annual reports we do have some data around compliance.

Ms ERRINGTON: The outputs.

Ms MOLLOY: The outputs.

The Hon. PENNY SHARPE: But specifically I am just after the kangaroos one.

Ms ERRINGTON: The kangaroo annual report.

Ms MOLLOY: Yes, I am talking about the kangaroo annual report. We do have some outputs—not specifics, obviously. But if that is not enough information we can try and get you some more.

The Hon. PENNY SHARPE: Mr Quirk, can you provide that for us for the non-commercial? Do you track the number of complaints and the activities of your officers?

Mr QUIRK: No, I am not confident that we can, but I will take that on notice. The question around compliance officers is a bit like the BCS. All our ranger staff are compliance staff. They are all authorised officers and they work across all of our regulatory activities, including kangaroo work. We also have access to four dedicated specialist field investigators that work with us across all of our business as well. So, yes, I can get you that number of rangers currently. It goes up and down. Currently it is in—I will not try and estimate it. I have a figure, but I will not quote it because I will be wrong. It is a larger group, but they work across everything that we do.

The Hon. PENNY SHARPE: Could you give us some specific data—I do not know what you have got—in relation to kangaroo-specific complaints around non-commercial culling?

Mr QUIRK: Yes. We have been involved in conversations. We do not have the same database, I will be honest, that BCS use and we should. It is something that is being worked on at the moment but—

The Hon. PENNY SHARPE: I can feel a recommendation coming on, Mr Quirk.

Mr QUIRK: I can feel a recommendation coming on.

The CHAIR: Sorry, BCS?

Ms MOLLOY: Biodiversity, Conservation and Science Directorate—that is my area.

Mr QUIRK: We all work as one team, but we do have different law enforcement systems. But, yes, I will get you that information both on numbers and complaints.

The CHAIR: Do you have a law enforcement system for non-commercial culling? Is there one?

Mr QUIRK: A system?

The CHAIR: When you say you have different systems, what is there in place at the moment?

Mr QUIRK: Most of the complaints that come in in a law enforcement matter about wildlife are dealt with by the area staff where the complaints are raised.

The Hon. MARK PEARSON: And what is being dealt with? What happens? When a complaint is being dealt with, what is the action?

Mr QUIRK: It will depend on the nature of the complaint and the investigation. We really deal with three issues. One is breach of licence, which is a matter for our staff. Often they are firearms-related offences, which we pass to New South Wales police. If they are welfare-related matters we pass them on to the RSPCA and the Animal Welfare League. There are bits of legislation we do not have jurisdiction under, which includes firearms and welfare. But we deal with offences against our Act, so we work with other agencies.

The Hon. PENNY SHARPE: So the only thing you are really tracking is if say you have given them a licence to kill 100 kangaroos and they have killed 150 and there is a complaint, then you can take action?

Mr QUIRK: Yes. We will often go out and meet complainants on the ground and actually try and work out what the complaint is. So if it becomes clear during that matter that it is a welfare issue we will pass that on to the RSPCA. If it becomes clear it is a firearms issue—many of the complaints we get—

The Hon. PENNY SHARPE: Let us not assume that people are actually doing the wrong thing, but say someone has got kangaroos on their property, they are very concerned about it and you have given them a licence to kill 100 kangaroos. They have gone out and killed 100 kangaroos but it is clear that the animals have suffered greatly because they have not had the skills. The kangaroo has not been shot in the head. They are just lying around in a bad way. You have got wildlife rescuers who have rung the bell on this and said, "Look, we are really worried. This is very problematic." Is it a welfare issue?

Mr QUIRK: That is an animal welfare issue.

The Hon. PENNY SHARPE: So they would complain to you and you would just put them straight onto the RSPCA?

Mr QUIRK: Yes, we would pass the matter to the RSPCA.

The Hon. PENNY SHARPE: You have absolutely no responsibility for the animal welfare part of the killing of the kangaroos that you licence?

Mr QUIRK: It is a licence condition. The licence condition is to comply with the code and the code outlines guidelines for the humane killing of kangaroos. So it is a breach of the licence, but it is much more fundamentally a breach of the animal welfare provisions in New South Wales.

The Hon. PENNY SHARPE: So you flick it to the RSPCA but there is really no consequence for the person who has got the licence that you take? There is nothing that you actually do to change their behaviour or to investigate or deal with that issue. You send it to the RSPCA and then it is—is that how it is dealt with?

Mr QUIRK: We would generally take their advice on welfare matters, yes, that is right.

The Hon. PENNY SHARPE: Can you provide, on notice, the number of times you have taken action for a breach of the code under the licence that had been given? Can you provide that to us for the last 10 years?

Mr QUIRK: I will take that on notice.

The Hon. CATHERINE CUSACK: Just to follow up, when was the last complaint made to the RSPCA about a breach?

Mr QUIRK: I would have to take that on notice, I am sorry. We do not have that information with us.

The Hon. CATHERINE CUSACK: I am trying to understand. You have emphasised to us the importance of compliance, so does anybody there know about this area of compliance and even whether any complaints have been made to the RSPCA or if any RSPCA officers are even out there to investigate?

Ms MOLLOY: Ms Cusack, we have a lot of information in our compliance database. I do not have that immediately to hand here but we can certainly find that out for you and get back to the Committee.

The CHAIR: Is that in relation to non-commercial killing as well?

Ms MOLLOY: I can comment on commercial.

The Hon. CATHERINE CUSACK: I will go back to the counting because obviously from this Committee's point of view there is so much conflicting evidence about what the population numbers are. Why have you not considered using drones that use thermal imagery in order to count? I heard earlier in the evidence that line of sight is not great for a drone, I understand that. The thermal imaging is what is being utilised for other species for counting, so why is that not being considered?

Mr BRILL: Do you mean thermal imaging under an aeroplane or a helicopter?

The Hon. CATHERINE CUSACK: Drones that do thermal imaging on the ground. They go around and you get a map basically using thermal imaging of where all the animals are. It is a highly accurate way of population count. I am just disputing your earlier statement that drones are ineffective because of line of sight. My question relates to drone technology utilising thermal imaging, which would be particularly effective in winter at night time. Are you confident that you are using the best technology and count methods, including consideration of these methodologies?

Ms MOLLOY: I might answer that. We are confident that we are using the best available data and science and methods available to us across a State the size of New South Wales to do what we need to do both in the western zones and also on the tablelands. Yes, we are confident that at the moment we are using the correct technology and systems. However, as I said earlier we are always open to new technologies, new cost-effective technologies, that may be used in the future. That may be thermal drones but I am not a drone expert; I am not a thermal imagery expert either.

The Hon. CATHERINE CUSACK: I am not talking about a technology of the future; this is a current technology.

Ms MOLLOY: Yes.

The Hon. CATHERINE CUSACK: It must have been discarded for a reason. If you are confident you are using the best methodology, clearly this one must have been considered and discarded for a reason. Maybe you need to take that on notice why that is not being utilised. In terms of the reproduction rate you were asked earlier to respond to the scientific evidence that we have received that 10 per cent population growth is a maximum. What is the actual figure that you are using in the calculations you are doing for the cull? This question is slightly different to the one that you have already been asked. What is the figure that is utilised in that calculation?

Mr BRILL: The quotas are based on 15 per cent of the previous year's population estimate for grey kangaroos and 17 per cent for red kangaroos, except where they depart from the mean, as I described earlier, and then they can be reduced to 10 per cent.

The Hon. CATHERINE CUSACK: When you calculate that 17 per cent—I thought you said 10 per cent earlier but it is 15, is it, for the greys?

Mr BRILL: The standard figure, if you like, for both eastern greys and western greys and common wallaroos is 15 per cent. The standard figure for red kangaroos is 17 per cent. When the population falls to 1.5 standard deviations below the mean, then it drops to 10 per cent. Then if it is two standard deviations below it is zero.

The Hon. CATHERINE CUSACK: Given that we have been told that just to maintain the population that 10 per cent is the annual rate, you have culling figures that are higher than that. You must be using a reproduction figure surely when you arrive at those percentages that are committed to be culled?

Mr BRILL: No, we do not.

The Hon. CATHERINE CUSACK: No, you are not interested in that?

Mr BRILL: We are interested. We are always interested in better models. But the current model uses last year's population estimate, which is surveyed in June-July. We are about to start broadscale surveys across the western plains of New South Wales next week. Those surveys and calculations will form the basis of the 2022 quota and that will be calculated in normal population terms at 15 per cent for greys and 17 per cent for reds. We do not actually use—

The Hon. CATHERINE CUSACK: Why 15 per cent? Let us just stick with the greys. How did we get that 15 per cent figure? How is that worked out?

Mr BRILL: The science tells us. There has been historical science done that calculates that the sustainable harvest rate can be around about 15 per cent and that is how that is set, based on the best available science.

The Hon. CATHERINE CUSACK: Does that science include or not include reproduction and gestation periods and things like that?

Mr BRILL: I would have to get back to you. I do not know the full detail of what is included in that, I am sorry.

The Hon. CATHERINE CUSACK: Could you provide us with that science and the sources for that science that will give a fixed 15 per cent figure irrespective? Secondly, your submission refers to thresholds where culling can be suspended. Can you tell us—

The CHAIR: Catherine, have you hit mute accidentally?

The Hon. CATHERINE CUSACK: Apologies. I am asking about the thresholds where culling is suspended. How are those thresholds calculated?

Mr BRILL: That is what I was talking about before. Based on the 45 years of population data for that zone and that species we calculate the mean. We also calculate the variation. Standard deviation is a measure of the variation.

The CHAIR: Catherine, would you mute when you are not talking?

Mr BRILL: The standard deviation—

The CHAIR: Catherine, can you mute? It is not done. I will text her.

Mr BRILL: Like most people I dislike my voice enough without hearing it coming back at me. I think we might be right now, are we?

The CHAIR: Yes.

Mr BRILL: So, Ms Cusack, we calculate the mean, the long-term mean, based on all of the monitoring that we have for that zone and that species. We calculate the variation and then a measure of the variation is this thing called standard deviation. When you are two standard deviations away from the mean or below the mean then quota is suspended or there is zero quota set. When you are 1.5 to two standard deviations below the mean then the quota is set at 10 per cent of the population.

The CHAIR: We might just interrupt. I am sorry but the Hon. Catherine Cusack has lost audio.

The Hon. CATHERINE CUSACK: I am back. I can hear.

The CHAIR: We just need to keep moving because we actually are running out of time. Mr Brill, if could finish answering this question and then we will go to the Hon. Mark Buttigieg.

Mr BRILL: Yes, happy to.

The Hon. CATHERINE CUSACK: Thank you.

Mr BRILL: Ms Cusack, are you happy with the explanation, or did you hear it, more importantly?

The Hon. CATHERINE CUSACK: I will put some more questions on notice, if that is okay.

The Hon. MARK BUTTIGIEG: Some of what I have to ask follows on from my colleague Ms Cusack's line of questioning. What I am picking up is that the estimated or assumed population growth is based on historical survey data as opposed to, for want of a better term without trying to sound pejorative, a biological approach or reproductive rate approach. Does it not make sense to actually listen to some of the hard science—the biological science—behind the limits to reproductive growth to feed into or to truth-check that historical survey data or are you not sure whether or not the biological data is being used in your estimates?

Mr BRILL: The biological data is a component, I am quite sure, of the sustainable harvest levels, but the second point I would make is that there is no evidence in the long-term history that commercial harvest has, in fact, regulated populations to any great extent. It is climate conditions, drought if you like, that make populations fall.

The Hon. MARK BUTTIGIEG: I am looking at your graph on the DPIE document, figure 3 from the *NSW Kangaroo Management Program 2021 Quota Report*. It talks about the combined red and grey kangaroo population estimates, authorised quotas and actual takes. When you say "combined red and grey kangaroo," does that cover the majority of species or is it only restricted to two species? I am not quite sure when you say "red and grey kangaroos". Is that the majority of the population of kangaroos in New South Wales?

Mr BRILL: Yes. I am not exactly sure which figure you are referring to.

The Hon. MARK BUTTIGIEG: It is the one where you start off with 1982 of a population of about—

Mr BRILL: In the submission?

The Hon. MARK BUTTIGIEG: It is the document entitled *2021 Quota Report*.

Mr BRILL: That is a bit different.

The Hon. MARK BUTTIGIEG: This is what you are basing your culls off, I imagine.

Ms ERRINGTON: We do annual surveys. Every year we do surveys in the Western Division. It is a spot count along a transect within a zone of how many animals there are, and then we use the model to extrapolate that to a population count and a quota. The reds and greys—eastern greys and western greys—do make up the bulk of the population from the commercial harvest, and then the fourth species that we manage is wallaroos more in the tablelands area.

The Hon. MARK BUTTIGIEG: I am following up from a line of questioning from my colleague Cate Faehrmann. She pointed out that what looks like has happened in that series from 1982 to present is that progressively there has been areas that have been added in. When you compare the population in '82 to now, you may not actually be getting an accurate picture because you have lumped in different areas as the years go by. It appears as though there is population growth on average when there may not have been. If you look at the '82 figure, it is around about 10 million red and greys and then in 2020 it is a bit above 10 million, which indicates that the long-term mean has stayed averaged. But when you add in those areas, you have actually lost a lot more because you have added clumps into the survey data. Am I right or not?

Mr BRILL: Yes, you are. There have been zone expansions, additional zones added—Central Tablelands, for example, has been added to the commercial cull; in fact, all of the tablelands since 1982. In terms of red and greys—greys include western and eastern greys basically in that graph.

The Hon. MARK BUTTIGIEG: We are making some assumptions here, but if you listen to some of the evidence we had on record over the past couple of days, particularly from those people who appear to have quite good qualifications in that reproductive biological sphere, if we assume that their 10 per cent figure is correct and we have a cull rate of 17 per cent and the population is artificially expanded as a result of adding those areas in, if we are sitting roughly the same as we were back in 1982, then it is possible that we are actually reducing the population quite dramatically with harvesting because 17 per cent as opposed to 10 per cent. If you just cannot physically grow the population beyond 10 per cent, then you are reducing by 7 per cent year on year. In the long

run, once these figures are corrected for those extra areas added in, we could actually be reducing the population quite significantly in theory.

Ms ERRINGTON: I think we can affirm that by just having a look at the data and getting back to you on that one, Mr Buttigieg. We will take that one on notice, thanks.

The CHAIR: Why does the correction factor change over time? You would have heard the evidence that we heard on Friday and some today and I am sure in the submissions. You know that is one contention. People are concerned about the estimates that the department provides. There is something called a correction factor, which we heard about on Friday. Why does it keep increasing?

Mr BRILL: It does not.

The CHAIR: It does not change?

Mr BRILL: No. There is only one species and one survey situation we use a correction factor for. That is the common wallaroo with helicopter surveys on the tablelands. It is a correction factor of 1.85, and it is used because of the relatively low detection rate for wallaroos from helicopter surveys. That is the best available science. Clancy and his studies in Queensland established the 1.85 correction factor.

The Hon. MARK PEARSON: What is a variation factor?

Mr BRILL: A variation factor?

The Hon. MARK PEARSON: When there was discussion about calculating the number of kangaroos to be shot, part of that equation—I think you walked us through these steps. One of them was a variation factor. What is that?

Mr BRILL: One is talking about correcting individual counts. The correction factor, developed by Clancy in Queensland, is applied to individual counts to calculate a population estimate. The other is looking at a whole population and its variation around the long-term mean. Forty-five years of data—let's say the mean is 10 for argument's sake. There will be a variation. Each year will be over and above that, and statistics can calculate a variation in those populations. That gives us a good basis to work out when the population is low enough that we should be reducing quotas. The variation is nothing to do with surveys, nothing to do with calculating the population, but rather a method that is used to set the proportional quotas.

The CHAIR: Back to these incredible numbers around Tibooburra, which is the grey kangaroo temporal variation. The percentage change from 2014 to 2015 was actually 426 per cent. It changed from 44,000 to 234,000. How can you explain that change?

Mr BRILL: I would have to take that on notice, I am sorry.

The CHAIR: There are other large jumps. This is an inquiry that is looking at kangaroo numbers and with respect, Mr Brill, I would have thought that the team would realise the questions that were posed to us and the evidence that we heard on Friday. Some of that evidence was around these factors. We talked about the numbers. We talked about the numbers from 450,000. Were you aware of and have you briefed yourself on the evidence that we heard on Friday?

Mr BRILL: Some of it, yes.

The CHAIR: Did you hear that we heard evidence about 450,000 in Tibooburra in Friday?

Mr BRILL: Not specifically, no.

The CHAIR: Would anybody else care to respond or know about that jump? I am the Chair and people can call me to order, but this is really the crux of the matter, is it not? We are here today with government witnesses. We have had ecologists present, really worried about the data and how the Government is determining the numbers. I am here asking the experts, the last witnesses for this inquiry—or maybe we will have another hearing, actually. At this stage, you are the last witnesses. This was a key point of discussion. So you cannot say how—all you can do is take it on notice. You cannot fathom a guess how those numbers are determined, how you get a 426 per cent increase. Can I say in the last year there was a minus 86 per cent increase. That seems to indicate either the numbers are plucked out of thin air to justify take or it seems to indicate a gross mismanagement of kangaroos under this Government in terms of the commercial killing. Which one is it? Is it either of those?

Ms MOLLOY: I will make a comment on that. As I said earlier, we collect information on an annual basis. We use processes to collect that information that are scientifically robust. We have got 45 years' worth of data. If we cannot comment on one specific figure today, we will get back to you on that. But we stand behind

what we do out in the field in terms of collecting that data and then subsequently analysing that data, the sophisticated models and statisticians that we use to advise us on the numbers.

The Hon. MARK PEARSON: Do you understand, because of the evidence that we have received from very credible scientists and witnesses, that your methodology is seriously in question?

Ms MOLLOY: We dispute that because we have got scientists and experts and statisticians that advise us on our scientifically robust way of collecting that data, interpreting that data and also analysing that data. Let us not forget—I have said it a few times now—it is very rare to have 45 years of data that you can analyse and try and predict and model what is going to happen around populations and it is annual surveys. We can see the population fluctuating, as my colleague Mr Brill said.

The Hon. MARK PEARSON: The question is the methodology. You might have your graphs and you might have your tables, but what is now seriously in question is the methodology—the instrument, the logarithm, the formula—that gets you those graphs and tables. We have received a great deal of very credible, robust scientific analyses of these figures and they are seriously in question. I need to point out to you—I do not know if you are actually aware of the absolute importance of getting these figures correct, because these animals are protected under three legislations in Australia, as I pointed out to you in the last budget estimates.

Ms MOLLOY: Yes.

The Hon. MARK PEARSON: If you have not got these figures correct, your department is authorising the killing of animals in a breach of possibly three legislations. So you have to have it absolutely right or we have people going out there killing animals which are actually protected as wild animals under three legislations. Do you understand the absolute seriousness of this?

Ms MOLLOY: Absolutely, and we take what we do very seriously and we are confident that our figures are correct. We can see how the population has fluctuated over the decades in relation to the boom and bust of drought and rain following drought and migration of kangaroos as well. We have got all that information and we use scientifically robust methods to collect it but also to analyse it and then interpret it. The other things that I mentioned in my opening statement make sure that we check and audit and double-check and make sure that there is compliance with all of the things that we do to manage kangaroos.

The CHAIR: With the 450 per cent increase that I referred to before, you are not suggesting that that is a boom period, are you, Ms Molloy, from the year before? Four hundred and fifty thousand.

Ms MOLLOY: It may be or it may be movement of—it may be. I do not know the specific number.

The CHAIR: Mr Brill, are you a kangaroo expert?

Mr BRILL: No.

The CHAIR: Is anybody on the panel an expert in kangaroo biology?

Mr BRILL: No.

Ms MOLLOY: No, but we have got them in our team—in Mr Brill's team.

The CHAIR: The 450 per cent increase in a population—does that seem feasible to anybody on the panel or do you not have the expertise to answer that question? You have just said boom, Ms Molloy.

Ms MOLLOY: Potentially, yes. I would have to look at the figures in the area and movement.

The CHAIR: We have heard this a lot to justify—and I suppose as a committee, we are really trying to get to the facts and not this boom and bust we keep hearing about. With the boom of 450 per cent, I would suggest that is not a boom. Mr Brill, would you suggest that is a boom?

Mr BRILL: I am not going to put a tag on it like that. It is important to remember this is not a closed population, so it is possible there is movement of kangaroos in and out of the area. That is why I took the question on notice because it is not as simple as just a number on a page.

The Hon. MARK BUTTIGIEG: Fundamentally, just as a matter of arithmetic honesty—perhaps that is the wrong phraseology. As a matter of analytical rigour, it strikes me that if you are going to present a bar graph that goes from '82 to 2021 and then lump in large swathes of population along the way, surely you have a control factor for that so that you are comparing like for like, but there has been no attempt to do that. It portrays the falsity that the population is exploding when it actually may not be. Can you see the issue here?

Mr BRILL: I can see that issue, yes.

The Hon. MARK BUTTIGIEG: Can I ask you just one follow-up. Has there been any attempt at estimating a baseline sustainable population of kangaroos—not based on, "Here's what we've got here and here's what we think it's doing," but actually an ecologically sustainable number of kangaroos per area based on science, or is it just, "Here's what we've got. Here's what we think it's growing at. Let's estimate a cull rate"? I am just trying to ascertain whether or not there has been any attempt at estimating what a good baseline population is. For example, in '82 it was 10 million. Has there been any attempt to say whether that is too much or too little?

Mr BRILL: I am not aware of any science to that effect.

Ms ERRINGTON: Are you talking about environmental loads, the amount the environment could sustain by hosting a certain population of kangaroos?

The Hon. MARK BUTTIGIEG: Presumably—not just the natural environment but the agricultural man-made environment as well, I guess.

Ms ERRINGTON: Certainly there is a lot of contributing factors there. That is not something we do, which is why we do the aerial surveys to do the population counts and look at sustainable population levels, which is the vibrancy of the population within a zone. That is why we set the quotas, but we can certainly look at research data. Just going back to the point earlier about the variation in the population increase, we do go back and look at the raw data that was collated for that particular region, the zone and the year and have a look and see what the contributing factors may or may not have been at that time. That is why we are happy to take that on notice, because we do not have the raw data available.

Ms MOLLOY: We can get you some information on that specific figure. We can go back to the raw data. We just do not have it here.

The Hon. BEN FRANKLIN: Let us just pull back then, one level up. Could you describe, please, what you do to ensure that kangaroos are harvested at sustainable levels? We have had a lot of discussion about what the definition of sustainability is and what the numbers are and so on. If you can just lay out for us what you do to make sure that when kangaroos are harvested they are harvested at sustainable levels, that would be helpful.

Ms MOLLOY: I talked a little bit about it earlier, but the team can go into a little bit more detail. The surveys are done, there is an annual quota, and harvesters have to have a licence and licence conditions. They will be handed out tags based on the species and the zone, depending on the quota. There is a lot of compliance that we do and chiller inspections and checking licences, et cetera. There is a whole range of different things that we do to manage from the start of the year when we hand out the quota to handing out the tags to following up. There are regular returns. I know I am not talking about all of it here, Mr Brill and Ms Errington, but there are lots of things that we do to manage it from the start of handing out the quota to the end of the year where we do an annual report. We talk about what happened that year as part of the commercial kangaroo management program. Then we start the process again and also with the surveys as well. So, Mr Brill, I may have missed a few things.

Mr BRILL: Would you like more detail?

The Hon. BEN FRANKLIN: Sure, I would. Penny, did you want to follow up quickly?

The Hon. PENNY SHARPE: I have a specific question about method. You can come back to this. In one of the submissions, it says the following in relation to changing of your methodology for counting. It says that essentially the population survey methodologies have changed over time, which you would expect because there are different arrangements. One of the submissions said, "The long-term western district survey methodology in New South Wales, which abandoned the 2016 surveys in western New South Wales ..." Is that true?

Mr BRILL: No.

The Hon. PENNY SHARPE: That is good to know. And then we have also changed the transects in which the surveys are done. Is that true?

Mr BRILL: That is true.

The Hon. PENNY SHARPE: What impact has that had and have you had a look at the impact on the changing of the transects, which I think happened in 2018?

Mr BRILL: I can outline what happened just so that we are all clear of that. Two changes occurred over the last five years or so and they happened at different times. That was quite deliberate. Historically, the surveys were flown east-west transects right across the State and they used a method called strip counting—originally 200-metre strips then 100-metre strips. I cannot remember the date of that change. In 2016 they moved to MRDS, which is marked recapture distance sampling. Do not let anyone tell you it means anything else.

The Hon. PENNY SHARPE: What does it mean? I have no idea.

Mr BRILL: It means marked recapture distance sampling.

The Hon. PENNY SHARPE: Can you explain that to the Committee? I have no idea what that means. The strip stuff made sense to me. This does not.

Mr BRILL: I can and will. Just go with me for a moment. I will explain the higher levels, then I will explain the detail of MRDS.

The Hon. PENNY SHARPE: Thank you. I appreciate it.

Mr BRILL: In 2016 they moved to MRDS. In 2017 they also used MRDS. In 2018 they changed the transects to zigzags in blocks—160-kilometre transects in 56 different blocks across the western plains. Something like 8,900-something kilometres of transects. That uses the much more sophisticated distance sampling method for analysis. Let me explain MRDS. In the fixed-wing aircraft we have the luxury of having at least six seats. We have a pilot and we have a safety person in the front, then in the two seats immediately behind we have four counters, two on the left and right. Those counters on the right or the left observe the same areas and they record what they see using an Xbox controller—so what your kids have been doing all these years might not be wasted.

The Hon. PENNY SHARPE: Good to know, Mr Brill.

Mr BRILL: That is recorded directly into a data logging computer. What we get basically is what—another term for marked recapture is double count. Two people count the same kangaroos in this case. They know because of the location and the timing of the recording that it is the same kangaroos. Sometimes one will miss those kangaroos. Sometimes the other one will miss those kangaroos. From that, the science and the statistics can calculate the detection function. One of the things they also record which is important in distance sampling is the distance from the centre-line. As you move away from the centre-line your ability to detect the animals declines and, in fact, declines quite sharply. So the detection function for each individual observer is really important in how that population is calculated.

The Hon. PENNY SHARPE: Can I just stop you there. Essentially you are arguing that, yes, they have changed. You believe that the MRDS methodology is more accurate. Has there been any comparison between the old transects and the new transects to see that there has not been some sort of massive change in the numbers as they appear under those two different methods?

Mr BRILL: As far as I know there was no parallel surveying—surveying the same populations by two different methods at the same time.

The Hon. PENNY SHARPE: No, that is right.

Mr BRILL: Although I believe science has done that in the development of the distance sampling method quite some time ago now. If you wanted, we could try to find that science.

The Hon. PENNY SHARPE: No. Your methodology has been challenged very heavily by the people who have come before the Committee. There is no accusation in the questions that I am asking you. I am just simply trying to understand that you have chosen particular scientific methods. Clearly it is in the public's interest that as public servants you believe these to be the best. I am just trying to unpack the concerns that others have raised in relation to this. That is why I am asking. There is no trick here. If I understand correctly, you believe that the new method since 2016 to 2018 and now ongoing is basically better, and you do not have any concerns about some sort of perhaps underestimate of counting. In fact, if anything, it would sound to me like you are probably getting a more accurate count. Is that a fair summary of your—

Mr BRILL: We certainly believe marked recapture distance sampling will give us a more accurate count. The peer reviewed science will tell us that that is the best available science at this time for calculating broadscale populations. That is why we adopt it.

The CHAIR: In relation to that, we heard from a statistician on Friday. She has been involved in conducting wildlife surveys in South Africa, Kenya and other places and suggests that 4.8 per cent, I think, of the zone—DPI states that 4.8 per cent of the zone may be surveyed. Is that correct?

Mr BRILL: No.

The CHAIR: No? Is there a percentage of a zone that is surveyed?

Mr BRILL: I think the western plains is around about 1 per cent. I would have to get back to you to confirm if you want a confirmation of an exact figure.

The CHAIR: Yes. That would be good. She suggests, in fact, that drought and climate change is not taken into consideration when looking at these variables. Is that correct as well?

Mr BRILL: The surveys survey the population there at the time. They do not need to take into account drought—the presence or absence. They are counting what is there at the time. There may have been drought leading up to what population is there at the time or there may be drought affecting what is there three months later but we count, in the surveys, what is observed on that minute that those counters fly past.

The Hon. MARK BUTTIGIEG: You talk about these strips of land. Let us call this room a strip. Does that mean every kangaroo in that area is counted or is it extrapolated that based on the density there is probably going to be this amount in that area? I was not clear on that how that worked.

Mr BRILL: The aeroplane, if we think of the western plains surveys, is fitted with rods that delineate distances on the ground. There are five what we call "bins" or "distance categories", if you like. They go from zero to 300 and it is split up. I think—do not quote me—it is zero to 20, 20 to 50 and so on and they get bigger as you go further out. The counters place the observed kangaroo or mob of kangaroos into one of those bins and, as I explained before, the closer it is to zero, the more likely they are to see it. The closer it is to 300, the more likely they are to miss it. I am not saying they are more likely to miss it. I am saying that the detection rate decreases as it goes further out. You cannot assume that they will all be seen. That is why we cannot just do a simple mathematical extraction for the amount seen multiplied by the area.

The Hon. MARK BUTTIGIEG: That question by my colleague, Ms Faehrmann, regarding the percentage, does that mean that methodology is only used for 1 per cent of a particular geographical area?

Mr BRILL: The surveys cover—I am pretty sure it is 1 per cent.

Ms ERRINGTON: Yes.

Mr BRILL: There you go. Ms Errington has confirmed that in the Western Division 1 per cent of the landmass occurs under that 300-metre band.

The Hon. MARK BUTTIGIEG: I see. But the actual quantum that you cover is the whole 100 per cent? You cover the whole area?

Mr BRILL: We randomly place blocks in each zone. There are five to seven blocks or something like that in each zone. There are 56 blocks across the entire western plains surveys and each of those are 160 kilometres in length—or the transect is because it is zigzagged. It is actually a 50-kilometre by 20-kilometre block and it has got 160 kilometres of zigzagged transect in it. So 160 kilometres multiplied by 600 metres—I did the maths the other day and it comes out to 0.96 per cent, so it is pretty close to 1 per cent.

The Hon. MARK PEARSON: Can I just ask a couple of clarification questions. When the observers are observing, is there any magnification used for them to look through?

Mr BRILL: No.

The Hon. MARK PEARSON: You are saying that when these blocks are observed and counted, whatever form they might take be it zigzag or whatever, that essentially would count or constitute—what they are counting is approximately 1 per cent of a zone? Is that correct?

Mr BRILL: I would say yes, but Ms Errington has started a seed of doubt in my head.

Ms ERRINGTON: Each block that we have 50 by 20 kilometres—9.6 per cent of each block is accurately surveyed.

The Hon. MARK PEARSON: So the block is surveyed. What percentage is that of a zone?

Mr BRILL: The total 56 blocks make up 1 per cent of the entire western plains surveys.

Ms ERRINGTON: Nine zones.

The Hon. MARK PEARSON: A person observing, could they tell the difference between a grey goat and a kangaroo from that height?

Mr BRILL: Absolutely.

Ms ERRINGTON: Yes.

The Hon. PENNY SHARPE: Have you seen them do it, Mr Pearson? Have you seen Richard Kingsford do the birds? Sorry.

The CHAIR: Order! We have got 10 minutes.

The Hon. PENNY SHARPE: It is amazing.

The Hon. MARK PEARSON: This block—is it taken into account that during drought or various times and conditions that there would be more kangaroos in an area where there are water sources than not? Is it taken into account that you are going to see more in some areas because of environmental changes or climactic changes to the zone?

Mr BRILL: The blocks in the western plains surveys are randomly placed and, other than a few tweaks after 2018 for safety reasons, we plan to stick with those. Certainly this year the same blocks will be surveyed. As was last year.

The CHAIR: Other concerns have been raised in a few submissions in relation to the wallaroo count in the Northern Tablelands, which increased by 269 per cent, I think, during drought conditions. Is there a reason for that?

Mr BRILL: I am not sure which table you are referring to.

The CHAIR: I think it is just the data, really. The table is what various people have told us has happened. Whether that is the situation—I do not have the reports in front of me. I have the data from some of the people who have gone through your reports.

Ms ERRINGTON: We spoke to Dr Cairns regarding that variation and he suggests that it is within an acceptable variation limit between years. Wallaroos predominantly can hide in the forested areas and at times they come into the open plains where then you may—lower down on the slopes where you pick up the count. But if they are in the trees, you will not see them as much. There can be variability within that count.

The CHAIR: Dr Cairns provided that in writing, did he? I wonder if you could take that on notice and provide if he has said that was all okay.

Ms ERRINGTON: We can take that on notice, yes.

The CHAIR: Mr Brill, has the Government agreed to import Bennett's wallabies from Tasmania to process here in New South Wales? Does that ring a bell?

Mr BRILL: The Government does not import kangaroos for processing at all.

The CHAIR: Have you approved the importation of Bennett's wallabies though from Tasmania to process by, I think, the Staughton Group?

Mr BRILL: Importation of Bennett's wallabies is quite legal, yes.

The CHAIR: So that has been agreed even though we do not have that species within the New South Wales commercial harvest management plan.

Mr BRILL: We have the species in New South Wales. It is not in the commercial harvest program. Correct.

The CHAIR: That is all above board according to our Biodiversity Conservation Act, is it, for us to be able to approve the importation of Bennett's wallabies from Tasmania to process here?

Mr BRILL: Yes.

The CHAIR: You gave that permission this year.

Mr BRILL: I did not need to give that permission. The licences were actually amended to make sure that was legal. There was never any—

The Hon. PENNY SHARPE: Who amended the licences?

Mr BRILL: I did.

The Hon. PENNY SHARPE: So there is an approval process, essentially, that you signed off on.

Ms ERRINGTON: It is allowed under the Biodiversity Conservation Act.

The Hon. PENNY SHARPE: Sure, but there had to be a decision made to allow this to occur.

Mr BRILL: There was a decision made to make sure that it was legal under their licences, yes.

The CHAIR: Has the department undertaken any kind of internal audit in relation to the kangaroo management program and whether compliance is—just an internal audit as to the systems and processes?

Ms ERRINGTON: We regularly review our systems and processes in terms of making continuous improvements around the administration. We have adopted a new wildlife licensing system over the last couple of years, which now provides better data and online licensing to move away from paper-based mechanisms to improve regulation and oversight of the program. We do look at how we can continuously improve our administration and regulation of the kangaroo program for that way. We do look at regular inspections from the broader compliance program around kangaroos as well as the other media that the compliance and regulation officers manage as well. There are a range of things that we do look at.

The Hon. PENNY SHARPE: Mr Quirk, does kangaroo culling occur in any national parks?

Mr QUIRK: That is a good question. It has been discussed a lot, but no, not that I am aware of. Other than there have been—in the feral-proof fenced areas it was raised as a possibility.

The Hon. PENNY SHARPE: That is like in Sturt National Park and those areas.

Mr QUIRK: Yes, Sturt. Those fenced areas where we have got exclusion fencing where we are trying to remove feral animals, there was a concern raised that large macropods can be problematic within the fences. There was talk of permitting culling but, as I understand it, in the end none have been culled. The animals have been moved out of the fences without the need to do so. It is an ongoing process in the small numbers in Sturt with one-way fences and letting the animals remove themselves.

The Hon. PENNY SHARPE: Have they been culled anywhere else?

Mr QUIRK: Not that I am aware of. We have discussed it. There has been a lot of conservation conversations around the role of kangaroos in grassland habitats in particular and whether their population densities are too high. It is a very contested conversation. I live in Canberra and the current cull is going on in Canberra at the moment. I have watched the changes in the woodland areas associated with kangaroos, but in New South Wales we have not done it. It is being pushed by a number of scientists as a live debate. You would have seen some of the papers published recently by Letnic and others maybe, but we have not taken it on. It is a debate that has probably run for 20 years in the Warrumbungles and elsewhere, but it has not been pursued in New South Wales.

The Hon. PENNY SHARPE: To date it has not actually occurred in New South Wales?

Mr QUIRK: No, it has not. The only reason I am cautious is I am trying to work out if there has ever been a problematic kangaroo. So, you know, if someone really pushes, I might find that there has been issues with individuals.

The Hon. PENNY SHARPE: Like an aggressive kangaroo in a picnic area or something?

Mr QUIRK: An aggressive kangaroo in a picnic area, yes.

Mr KINGSWOOD: Or euthanasia after an animal may have been hit by a car or something similar in a park.

The Hon. PENNY SHARPE: Obviously that is less of a concern.

Mr QUIRK: But as an ecological tool or a population tool, we have not used it. Other States have. We are one of the few States that has not.

The Hon. PENNY SHARPE: The kangaroo management program, how is that funded within the department?

Mr BRILL: The commercial kangaroo management program unit is essentially almost entirely—not entirely, but almost entirely—funded from licence fees and tag sales.

The CHAIR: I wanted to ask, in the couple of minutes I think we have left, about the industry itself. There has to be returns. Is that correct? How are they monitored? What is that system?

Mr BRILL: Harvesters have to submit monthly returns for each of their batches of tags that they order or purchase—so they are monthly returns. Chillers have to report weekly returns and processors report quarterly. That quarterly is for, essentially, export from New South Wales and internationally.

The CHAIR: Have there been any issues with those returns? Are they all done in a timely manner?

Mr BRILL: It depends a little bit on whose standards. They are very good, but I would like them to be better. I started this job in July last year and that is one thing I am working very hard to improve. But they are very good, like, they are high nineties. The harvest returns is high 90s per cent for last year. It is only 1.5 per cent or something that was not submitted at the end of last year. But I want 100. I want it as close to 100 as I can get.

Ms MOLLOY: Yes and that is part of our continual improvement process of some of our reporting and monitoring of what is going on and just trying to make sure everything is done to 100 per cent if possible.

The Hon. BEN FRANKLIN: I have just one question to put on notice.

The CHAIR: I think we will all have questions on notice.

The Hon. BEN FRANKLIN: We had a contention from a previous witness that we could in fact deal with this whole issue by providing approximately \$10 million a year to ensure that (a) crop damage was dealt with, which was about \$4 million a year, and (b) fences were fixed, which was about \$5 million to \$5.6 million a year throughout the State, and that would mean that we would not need to do any culling of kangaroos at all. Could you, on notice, respond to that and whether those figures are reasonable?

The Hon. MARK PEARSON: I have two very quick questions on notice.

The CHAIR: No.

The Hon. MARK PEARSON: I will write them to you.

The CHAIR: We will have more questions to provide you when we get the transcript back. You did take some on notice as well. The secretariat will be in touch with you with those questions on notice. Thank you for appearing today.

(The witnesses withdrew.)

The Committee adjourned at 17:00.