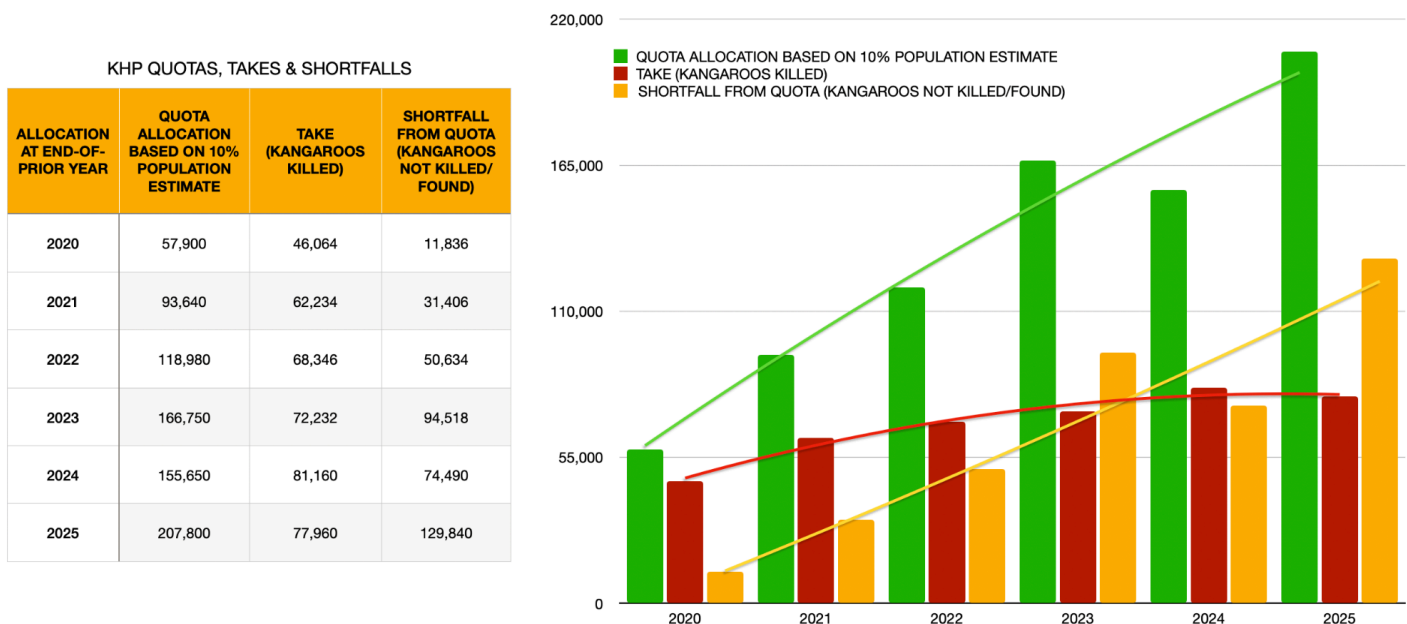


What's wrong with the Kangaroo Harvesting Program (KHP)?

1. Isn't the KHP sustainable?

With the release of the Victorian government's Kangaroo Harvesting Program (KHP) 2025 Annual Report, the latest data continues to confirm the trends of previous years showing that, under the KHP, 'harvesters' (licensed shooters) are not able to find the number of kangaroos they are authorised to kill under the government's quota system, despite having a financial incentive to do so.

In fact, the data shows that the numbers they find continue to fall year-on-year—contradicting the Government's ecologists' assurances of consistent and “sustainable” population growth. Confirming this trend is the increasing difference between the quota and the numbers killed (called ‘take’). (see Figure 1)



Given that harvesters are paid per carcass (and counted by the use of registered tags), and that they can't even attain the quota allocated to them, the government's ecologists, who designed the system, should be sounding the alarm bells.

But instead, they ignore their own evidence and have blamed harvesters, stating that they “*did not use the full quota available to them.*”¹ Despite this, the quotas continue to rise, and the combined average commercial and non-commercial quotas are now more than triple what they were prior to commercialisation.

¹ Kangaroo Harvest Program annual statistics; *Summary of harvesting activity in 2023*, <https://www.wildlife.vic.gov.au/our-wildlife/kangaroo-harvesting-program/kangaroo-harvesting-program-annual-statistics>; accessed 1 December 2024

It has been stated that “The only really accurate way to count them, it seems, is to shoot them,”² and this indicator, against the paradoxical growing estimate and quota, shows that their numbers are, in fact, falling.

2. Is the kangaroo population survey design sound?

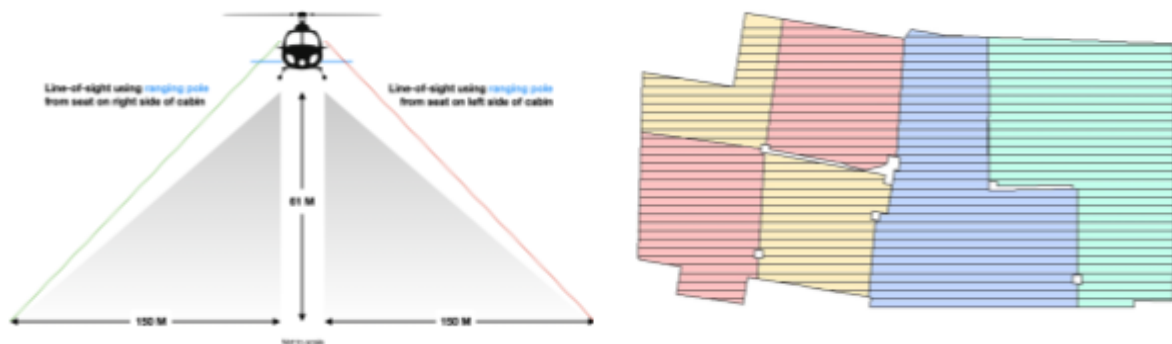
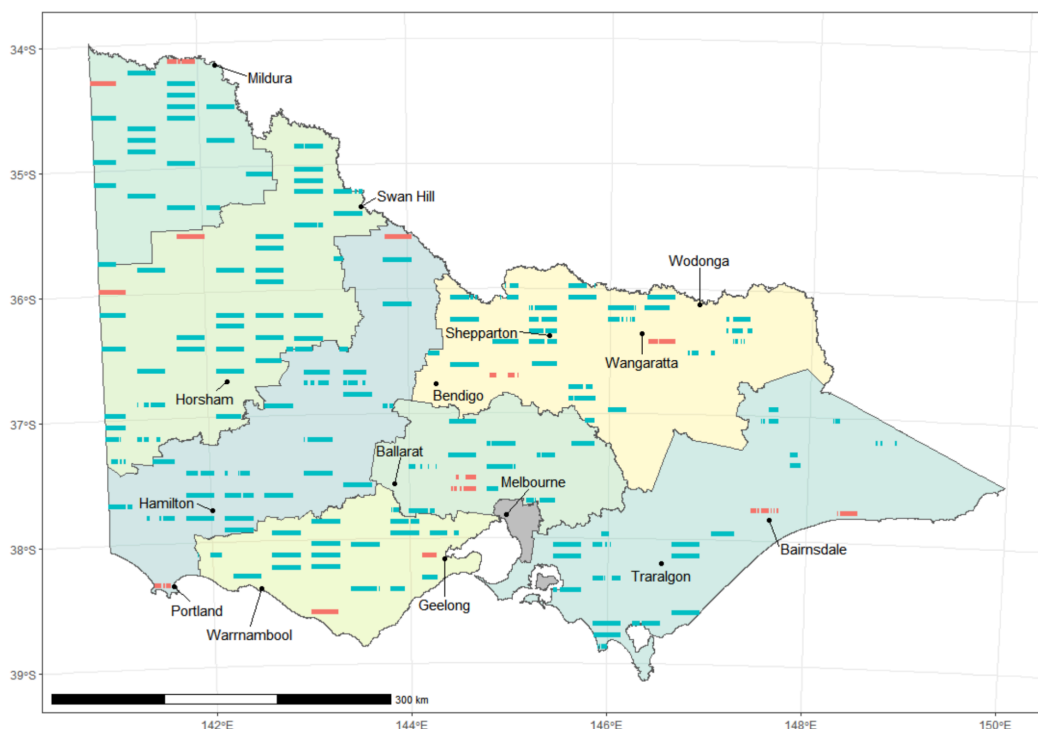


Figure 2: How a helicopter is used to detect animals on the ground; a transect layout showing contiguous flight paths.

Credible aerial survey designs demonstrate that optimum precision in detecting a target species is obtained by flying helicopters over either 100% or 50% of an area. Similar to mowing a lawn, these helicopter ‘transects’ should be contiguous or at least adjacent to each other.³ (See Figure 2)

Victorian government kangaroo surveys, however, are conducted by helicopter on only **0.5%** of the State’s potential and accessible habitat (the ‘harvest zones’). That's right: the population estimate for the entire State is only based on a survey of **half of one percent of it**. Apart from the grandiose scale of the design (not a property, nor national park, but a whole State): 150 transects, 300 metres wide, 20 kms long (average), are spread irregularly, some hundreds of kilometres apart, with no connection or relationship to each other. (See Figure 3)



² Mjadwesch R (2011) Nomination to List the Large Macropods as Threatened Species under the NSW Threatened Species Conservation Act 1995 MESS Bathurst; *counting kangaroos 3.1 Problems with counting kangaroos*

³ Montalvo, A., L. A. Brennan, M. L. Morrison, E. D. Grahmann, and A. N. Tri. (2022) Distance sampling survey effort to improve density estimates of northern bobwhite. Wildlife Society Bulletin 46:e1303. <https://doi.org/10.1002/wsb.1303>

Figure 3: Transect map from 'Statewide abundance of kangaroos in Victoria, 2022 Results from the 2022 aerial survey.' Note that the wide drawn transects on this map are not to scale and only denote location. Being 300m wide in real operation, they would not be visible if shown in actual size.

The numbers of kangaroos detected in that 0.5% area are then extrapolated to proclaim an “estimate” of the population for the remaining unsurveyed 99.5%. (See Figure 4)

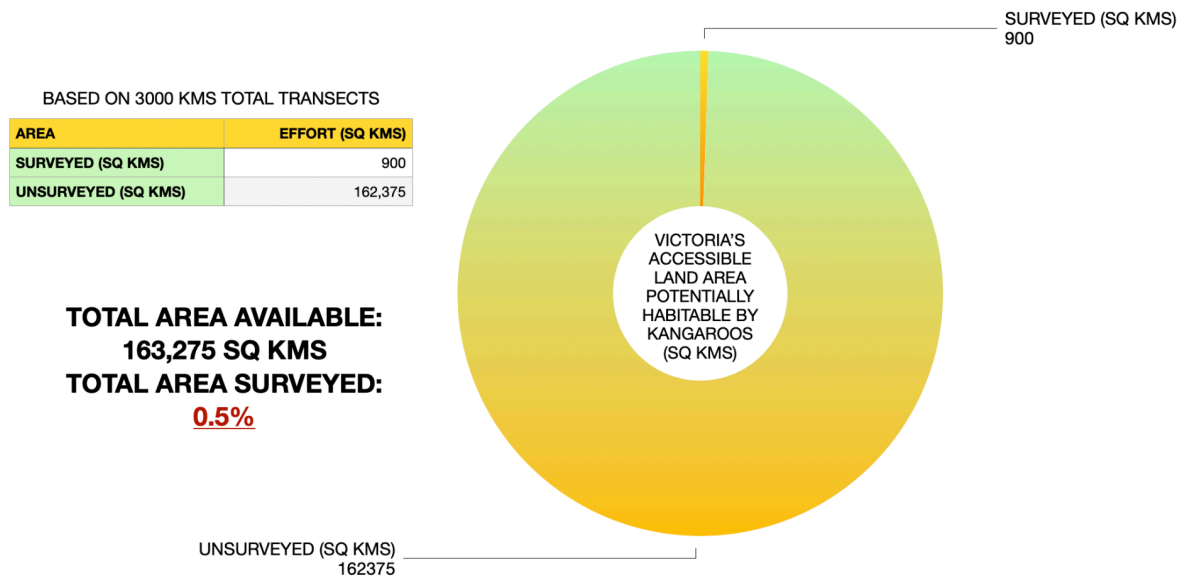


Figure 4: What 0.5% of the State's surveyed area looks like against the remaining potential habitat.

This, then, is the scientific basis which enables the broadscale slaughter of a normally protected native species in its natural habitat, in the belief (or perhaps hope) that a 10% quota is conservative and will not adversely impact the overall kangaroo population.⁴ *This is the scientific equivalence of crossing ones' fingers and hoping for the best.*

But the KHP surveys ignore that kangaroos live in mobs,—one of its authors even admitting that mob groupings result in low precision⁵—that they are mobile within a home range, and assumes that they are evenly distributed across the State. On this point, raw data from helicopter operation from 2018 even revealed 36 transects across all 7 harvest zones **failed to detect any kangaroos**⁶ contradicting the assumption of even distribution. And yet this finding is not considered in the final estimate.

Despite the statistical inconvenience of kangaroo groupings/aggregations/mobs, the correct methodology, according to experts in distance sampling surveys, is to count them as one unit or cluster.⁷ In Victoria, however, groupings are enumerated individually in the

⁴ Scroggie, M.P., Moloney, P.D. and Ramsey, D.S.L. (2017). Design of an aerial survey to estimate the abundance of kangaroos in Victoria. Arthur Rylah Institute for Environmental Research Technical Report No. 280. Department of Environment, Land, Water and Planning, Heidelberg, Victoria. 2.2 Study Area and Stratification, "The presence of additional kangaroos in the unsurveyed portion of the state will add an additional margin of safety to the sustainability of any future population control operations." p5

⁵ Moloney PD, Ramsay DSL, Scroggie MP. 2023. Statewide abundance of kangaroos in Victoria, 2022 Results from the 2022 aerial survey; "Although high levels of kangaroo aggregation in some zones continue to hamper the precise estimation of density and abundance for individual harvest zones, the level of overall precision can be considered adequate for the setting of sustainable harvest quotas. Alternatively, given the high level of kangaroo aggregation observed during the aerial surveys, consideration could be given to using a model-based distance sampling approach," p12
<https://www.parliament.vic.gov.au/49e2e8/globalassets/tables-paper-documents/tables-paper-8308/document-823.pdf>

⁶ <https://www.parliament.vic.gov.au/49e2f1/globalassets/tables-paper-documents/tables-paper-8308/document-85.pdf>

⁷ Thomas L., Buckland ST., Rextad EA., Laake JL., Strindberg S., Hedley SL., Bishop JRB., Marques TA., Burnham KP. 2010. Distance software: design and analysis of distance sampling surveys for estimating population size. Journal of Applied Ecology, British Ecological Society. p6 <https://doi.org/10.1111/j.1365-2664.2009.01737.x> accessed online 1 December 2024

raw data, against best practice. This is yet another point of error which contributes to distortion of the results.

Not surprisingly, as the design is also indifferent to the random movement of mobs within home ranges, it is not difficult to see how this enumeration would provide a false positive result for population growth. (See Figure 5)

Experts also emphasise the need to first validate the assumptions underpinning novel survey designs before relying on them as a monitoring program.⁸ The government survey design documents show that this validation has never been performed relying wholly on desktop analysis.

And worst of all, it demonstrates how some scientists refuse to change their views, even when confronted with new evidence that indicates they should, while remaining willing, it seems, to provide flawed information to their Minister.

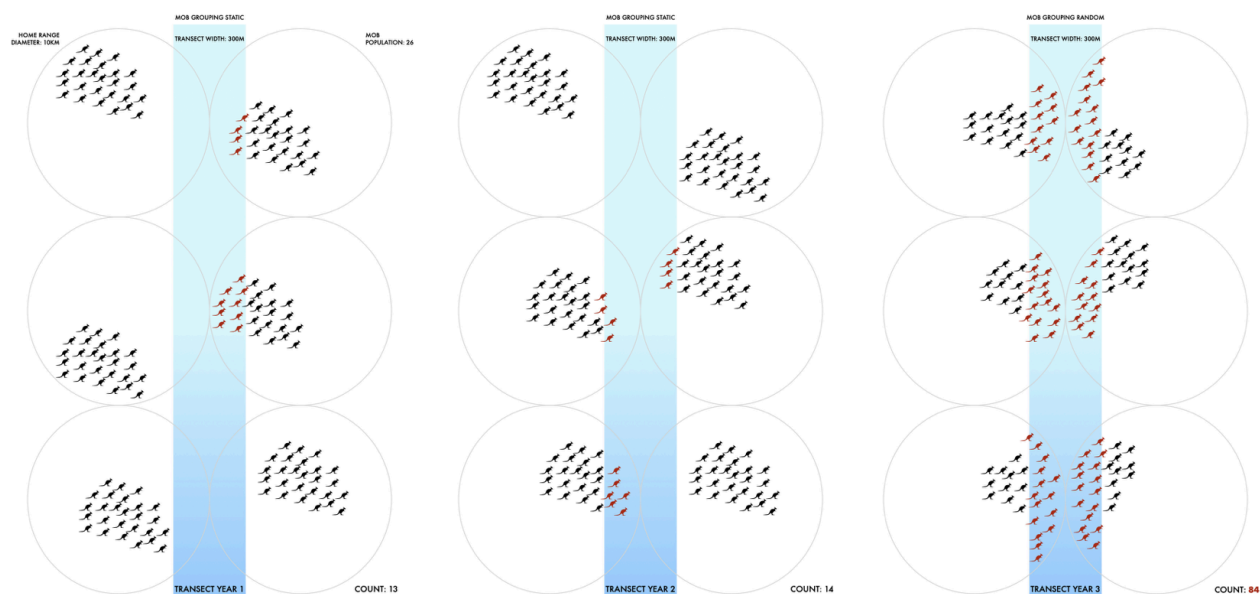


Figure 5: In each of these simulations, the actual population of kangaroos in each circular home range has not changed over three years. But by relying on an isolated aerial transect, one can see that in Year 3 the mobs have moved closer to the survey area, and more have been detected. This will be interpreted under the current calculations as a "population explosion."

2. How much does it cost, and does it provide the Victorian taxpayer with any benefit?

Not only is this bad science but it is a hugely expensive exercise subsidised by the Victorian taxpayer, to 2024, costing **\$5,409,750** (See Figure 6)⁹, for the benefit of a

⁸ Thompson WL, White GC, Gowan C, (1998) Monitoring Vertebrate Populations, Academic Press, California. pp 76-77 3.2

Incomplete Counts

"Incomplete or partial counts mean that not all individuals are counted on the sampling unit or, possibly, over the sampling frame, (e.g. aerial survey)...Ad hoc methods are an improvisation based on properties of empirical data; there are no known statistical theories underlying these methods so they can't be rigorously assessed for statistical validity.

The key in this latter case is the biological validity of underlying assumptions. That is, methods known to have statistical properties, still will produce invalid abundance estimates if the assumptions underlying these methods are not biologically realistic. Thus, assumptions underlying any method of population enumeration must be tested for validity before the method is used as part of a monitoring program."

⁹<https://www.parliament.vic.gov.au/4aa4c9/globalassets/tables-paper-documents/tables-paper-8399/document-2.21--khp---costing-overview.pdf>

private, profit-driven industry. It might be argued that issuing tags to harvesters was intended to be a means of cost recovery, however there has been no reporting on this from available documents to ascertain any income generated. Where has it gone?

Realising the tax offsets that will be legitimately claimed by Industry and its harvesters, it can be seen that there is little or no economic benefit to the State. Quite simply, Victorian taxpayers are unwittingly subsidising and enabling wildlife slaughter.

	2019	2020	2021	2022	2023	2024
ESTABLISHMENT OCT 2019	\$533,750					
PROGRAM GMA + SLA p.a.	\$190,625	\$571,875	\$762,500	\$762,500	\$762,500	\$762,500
DESIGN		\$50,000				
STAFF		\$65,000				
SURVEYS (HELICOPTER ETC) p.a.	\$37,500	\$112,500	\$225,000	\$225,000		\$225,000
STAFF p.a.		\$19,500	\$26,000	\$26,000	\$26,000	\$26,000
SUBTOTALS	\$761,875	\$818,875	\$1,013,500	\$1,013,500	\$788,500	\$1,013,500
CUMULATIVE TOTAL	\$761,875	\$1,580,750	\$2,594,250	\$3,607,750	\$4,396,250	\$5,409,750

Figure 6: Conservative costings based on the 2019 declarations. CPI increases and increasing costs of helicopter operations over the 5 year span (passed on by different providers) have not been factored into these expenses.

Add to this, evidence suggests that Industry participants threatened the Government with damages claims when it halted the program during the Victorian 2019/2020 bushfires due to environmental concerns.¹⁰

What pre-existing circumstances would embolden an Industry with such arrogance while simultaneously being the indirect beneficiary of substantial Government largesse?

What is the taxpayer to make of being regarded with such ungrateful contempt?

3. Is there any truth to the stories that we hear that there are too many kangaroos?

Despite evidence to the contrary, many farmers continue to insist that kangaroos are “in plague proportions” or their “populations are exploding,”¹¹ not based on any novel or credible surveying technique, but just on the limited vantage point of their property boundaries or from the windows of their cars while driving. Ergo, “If I see more, there are more.”

As these claims have persisted over generations, the ‘kangaroo plague’ appears supernaturally long given the short life cycle of past mice and locust plagues.

The one thing that *is* in abundance is the paucity of evidence. No one, it seems, is prepared to provide credible video images of the “plagues” that they say they witness

¹⁰ Briefing for Minister of Agriculture (23 January 2020) 4(a), 4(b), p4, <https://www.parliament.vic.gov.au/4a3329/globalassets/taled-paper-documents/taled-paper-8399/document-2.07-bmin-2-20-2275---signed1-2.pdf>

¹¹ Hunt P. 2024. ‘Not making a dent’: Roo numbers explode in Victoria. Weekly Times. <https://www.weeklytimesnow.com.au/news/not-making-a-dent-kangaroo-numbers-explode-in-victoria/news-story/92a2f72f90c00a644247098b714e490e>

on a regular basis. Nor are they prepared to take up the invitation for professional film-makers to attend their location to document the populations that they claim are decimating Australia, and instead defer to the “they’ve all since dispersed” excuse.

Claiming impossible reproduction rates that defy well-understood kangaroo biology, they demand that a vigorous program of shooting these “pests” continues unabated— mostly stopping short of calling for their extinction—in order to reduce a perceived competition for food and water with the sheep and cattle they rear. This enduring fallacy persists, despite having been dismissed by industry apologists after being measured and proven to be exceedingly low.^{12,13,14}

Other prominent commentators, however, have been less circumspect about their desire to see kangaroos wiped off the face of this country.¹⁵

History reveals that farmers used this same tactic—demonising the Tasmanian Tiger as a pest and threat—to drive it to extinction in 1936, taking only 100 years to achieve through a similar government-sponsored bounty system. The mistake was eventually discovered and protection granted, only six months before the population disappeared.

Ironically, even granting the government's wildly exaggerated estimation, kangaroos still only account for a fraction of the precisely known abundance of other species that *have* aggressively changed the Victorian landscape, requiring cleared habitat: 15.4 million sheep, 3.6 million cattle and 6.7 million humans.¹⁶

4. Is anyone else checking the numbers?

In 2021 a ground survey, co-ordinated by local ecologists who recruited citizen scientists using freely available wildlife observation software, conducted a count of the Mornington Peninsula’s Eastern Grey Kangaroos (EGK).¹⁷

Against DEECA’s desktop estimate of 7000 (based on survey data extrapolated across the whole of Gippsland) they revealed the reality of a population of 2200—**almost 60% less than the ‘official’ survey**. DEECA remained silent against this discovery.

Curiously, DEECA scientists do call on citizen scientists to assist its survey efforts with other species,¹⁸ a collaboration which provides insight into the reliability of its survey designs against the greater precision of on-the-ground counting.

But this openness does not extend to kangaroos. By avoiding the opportunity to confirm or disprove the KHP survey’s reliability suggests a ‘sunk cost’ bias in scientists and an unwillingness to change their minds in the presence of new evidence—an opportunity any reputable scientist should embrace.

¹² Grigg GC. 2002. Conservation Benefit from harvesting kangaroos; status report at the start of a new millennium, a paper to stimulate discussion and research in Lunney D, Dickman C (Eds) A Zoological Revolution - Using native fauna to assist in its own survival

¹³ Munn AJ. Dawson TJ. McLeod SR. Croft DB. Thompson MB. Dickman CR. 2009. Field metabolic rate and water turnover of red kangaroos and sheep in an arid rangeland: an empirically derived dry-sheep-equivalent for kangaroos. *Australian Journal of Zoology* 57, 23-28. <https://doi.org/10.1071/ZO08063>

¹⁴ <https://kangaroomanagementtaskforce.com.au/kangaroo-facts/grazing-pressure-from-kangaroos/>

¹⁵ “The kangaroo’s a wonderful, fuzzy, natural part of our environment; they’re delightful, they’re ‘Dot and the kangaroo,’ they’re maternal, caring for their joeys, and *they’re also a pest that should be eliminated wholesale.*”

—Dr Peter Chen, Snr Lecturer in Public Policy and Australian Politics, University of Sydney. Excerpt from Kangaroo: A love-hate story @4:18

¹⁶ Meat & Livestock Australia 2022 data, Australian Bureau of Statistics census 2022 data

¹⁷ Carter V, Holland G, Mooney M. 2021. Results from the Peninsula Count Your Mob Project; locally published report

¹⁸ <https://www.wildlife.vic.gov.au/media-releases/calling-citizen-scientists-to-help-critically-endangered-bird>

This localised, real world study reinforces the poor scientific methods and assumptions being utilised by DEECA when no justification exists to support the slaughter of a native animal that, along with its evolutionary common ancestors, has adapted and thrived in this landscape for 20 million years.

5. Is the KHP actually humane?

Since the KHP's implementation in 2019, Wildlife Victoria reports a 55% increase in the number of callouts to kangaroos that have been wounded by licensed 'expert' shooters, often found with open facial fractures and avulsions but were able to flee the scene, ultimately requiring sedation and euthanasia by rescuers. In the same timeframe, they have recorded a 478% increase in orphaned joey cases.

According to forensic evidence presented to NSW Parliament in 2021 regarding a similar program in that State, non-fatal wounding is happening up to 40% of the time.¹⁹

Dependent joeys that remain at the scene are killed by decapitation or by bludgeoning, which is permitted by a Code of Practice and deemed humane. (cite global declaration)

That Victorians pay for a program to prop up an Industry from which they derive no benefit is bad enough.

But to be unknowingly supporting widespread animal cruelty, dishonestly sanitized by the Code of Practice as 'humane euthanasia,'²⁰ with lofty ideals that cannot be enforced, is something which would disgust and enrage most caring and reasonable Victorians.

Multiple domestic and international animal welfare organisations have acknowledged the community's repugnance of this cruelty in a global declaration.²¹

Animal suffering is part-and-parcel of the KHP but is exempt from legal sanctions under the Wildlife Act 1975 due to a loophole provided by the Governor-in-Council. *Shoot a kangaroo **without a permit** and you'll be vilified as a monster and incur a substantial penalty. Shoot a kangaroo **with a permit** and you can call yourself a responsible conservationist, make some money and avoid any likelihood of conviction.*

6. Don't "Extraordinary claims require extraordinary evidence"?

Such is the test for establishing the truth in any grandiose claim. DEECA's main claim in advancing the program's bona fides is essentially this: *Victoria can afford to support kangaroo shooting because there are enough kangaroos around for the Industry to be sustainable over time.* It is a bounty system that believes it can maintain a background population—a claim which has never been verified.

¹⁹ NSW State Government (2021), Health and wellbeing of kangaroos and other macropods in New South Wales, <https://www.parliament.nsw.gov.au/lcdocs/inquiries/2707/Report%20No%2011%20-%20PC7%20-%20Health%20and%20wellbeing%20of%20kangaroos%20and%20other%20macropods%20in%20NSW.pdf>

²⁰ National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes AgriFutures Australia Publication No. 20-126, p15

²¹ 'Kangaroos Alive (2024) - A Global Declaration of the Kangaroo Welfare Crisis. Available on <https://www.kangaroosalive.org/declaration>'

In its documents DEECA implies from its initial design document that there is no way to count all kangaroos with any certainty but settles on sampling to what is revealed as 0.5% of Victoria's suitable habitat, which also is accessible to shooters, as a way it can be confident of this sustainability through the use of mathematical modelling and predictions.

Its "conservative" 10% kill quota of the estimated statewide population is fundamentally flawed in the presence of disinterest in the fall in 'take' despite the 'sunk cost' belief that populations are growing.

DEECA's claim is both extraordinary and unvalidated but, despite the appearance of a systematic approach to surveying and its use of complex mathematical extrapolations, it can provide no compelling evidence that populations are sustainable. It relies on conjecture and assumptions and that there are kangaroos present to count.

Its claims exist within a closed departmental 'silo' and are not open to disconfirmation, with the exception of the aforementioned independent ground survey, which demonstrated a huge error despite the previously stated high levels of confidence with its own calculations.

This has been ignored by department scientists and we should be less-than-impressed by their commitment to academic rigour and self-reflection.

Victorians should remain critical of the assumptions underpinning this program, which are being used to secure government legislative support for the benefit of private industry.

Perhaps we can take guidance from a quote of the late Christopher Hitchens, "That which is asserted without evidence, can be dismissed without evidence."

The kangaroo harvesting program deserves nothing less than the harsh judgement of the Victorian community as a deceptive and misguided policy founded on scientifically unsupported claims, and should be ceased immediately.