Statutory Review of the Eastern Grey Kangaroo Controlled Native Species Management Plan

Preliminary comments by Frankie Seymour on behalf of the Animal Protectors Alliance

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Matters to be covered by the review

In a recent press release about the proposed review, Rebecca Vassarotti mentioned, *inter alia*, the following matters to be reviewed:

- the effectiveness of the conservation culling program in achieving target population densities and grass structure;
- the 2017 Plan; and
- the culling calculator instrument (which includes three components).

This paper, prepared for a preliminary stakeholder meeting with Dr Sarah Legge, examines the science underlying these three matters.

Our full submission, when Dr Legge's review is completed and released for stakeholder comment, will cover many other issues besides these.

Measuring biodiversity

It is telling that the Minister considers "achieving target population densities and grass structure" to be a desirable outcome, and therefore worthy of review, but does not appear to consider the effectiveness of the conservation "culling" program in achieving good conservation outcomes to be of any interest at all.

Achieving target population densities and grass structure is a disingenuous and invalid indicator of the effectiveness of the killing program, for two reasons, as follows:

(1) "Achieving target population densities (of kangaroos) and grass structure" implies that some arbitrary range of grass height is indicative of a "grass structure" that is in turn indicative of high biodiversity.

This is too convoluted a series of purported correlations to be taken seriously: that a range of grass height correlates to a certain grass structure; that this grass structure correlates to good habitat for reptiles; that good habitat for reptiles correlates to high biodiversity.

The essential ingredient of biodiversity is diversity. Obviously, the more diverse the range of vegetation types, and the range of heights and densities across all vegetation types, the more habitat options will be available for other organisms.

An arbitrary grass height might (possibly) be good for several species of reptile, but one class of vertebrate animal is not, itself, in any way indicative of high biodiversity. In theory, a high population of various reptiles could, just as easily, be indicative of low biodiversity, just as high biomass is often indicative of low biodiversity. Indeed, a high population of various reptiles might not even indicate that the lizards themselves are doing well if, for example, they have bred up their numbers in response to a good season, eaten out their food supply and are now starving.

(2) "Achieving target population densities (of kangaroos) and grass structure" implies that a negative correlation between kangaroo numbers and reptile numbers at a certain range of grass height in certain ACT reserves, somehow means the kangaroos were adversely impacting on the reptiles.

No study showing a correlation between populations of only one class of one phylum of animal species even begins to suggest a cause-and-effect relationship with another species. All other variables, including populations of all other animals and all other plants in the ecosystem must also be counted.

Even if all species were counted, the results would remain inconclusive unless the impacts of other variables such as the legacy of grazing by introduced farm animals, climatic changes, hydrological changes, proximity of busy roads, pollution impacts, fire regimes, flooding regimes, and encroaching urban development (to name a few) are also accounted for.

In the reptile studies cited in the Kangaroo Management Plan (KMP), for example, Howland et al 2014, the land where the study took place was already irreparably damaged by overgrazing by domestic livestock. The government started slaughtering the kangaroos on the Canberra Nature Park (CNP) in 2009 without any baseline data from before they started the killing on the correlation in the populations of kangaroos and reptiles. For all we know, the correlation between kangaroos and reptiles, before the ham-fisted intervention of a killing program, might well have been consistently positive. Ecological outcomes are rarely linear.

Even if all current variables were somehow accounted for, relationships between species are dynamic, changing as other environmental conditions change. Time series data (using consistent methodologies) would be needed over decades, covering the full range of environmental conditions and species present, before any (even tentative) conclusions could be drawn. Such time series data could easily reveal that the health of the reptile population actually requires a negative correlation with the kangaroos at certain times, under certain conditions.

Ecosystems, by definition, are about relationships between species (and their landscapes). Therefore, any methodology for measuring biodiversity is going to measure only a correlation, not of a cause-and-effect relationship. However, some measurements that demonstrate a correlation are more likely to be indicative of a cause-and effect relationship than others.

Kangaroo exclusions zones, for example, have been mooted as a way of measuring the impact of kangaroo grazing on biodiversity generally, by comparing the resulting range and richness of species inside and outside the zone. This approach could conceivably yield useful results, but only if three conditions are met:

(1) that the exclusion does not reduce the grazing range available for the excluded kangaroos, because a reduction in range could be expected to result in heavier grazing outside the exclusion zone than would otherwise have occurred, thus skewing results;

(2) that every species of plant and animal (and as far as possible, every individual plant and animal) both inside the exclusion zone and across a similar area outside the exclusion zone, is counted; and

(3) that the study is conducted over a couple of decades so that the long-term impacts of excluding a keystone species from the exclusion zone have time to emerge.

The next best thing to a longitudinal (time) study of correlations between kangaroos and other species inside and outside exclusion zones is a shorter term study of the correlation between kangaroos and quality of habitat (as indicated by vegetative richness and diversity) across a range of differing but essentially contiguous kangaroo habitats, such as the reserves of the CNP.

Fortunately, we do have such a study: the CSIRO Plant Industries Report of 2014 (Vivian L and Godfrey R, 2014). It showed, on the basis of the Directorate's own data that, where kangaroos at densities of one to three kangaroos per hectare are present, with no apparent difference between one, two or three per hectare, the richness and diversity of vegetation on Canberra reserves is greater than where kangaroos are absent. It further revealed that few of the reserves studied had more than three kangaroos present, too few for useful analysis.

Since it is richness and diversity of vegetation that creates the habitat for rich and diverse animal life, it seems clear from this study that the relationship between kangaroos and their ecosystems in the CNP is a positive one, not the negative one implied by the multiply flawed reptile studies.

The Directorate might claim the only reason the number of kangaroos per hectare on the reserves was no more than three per hectare was because of its annual killing program. This argument is invalid. The ACT is not an island. It is surrounded by rural NSW. The CNP

reserves are also not islands. They are (notwithstanding the deadly roads that bisect them) a single contiguous habitat.

While NSW is well on its way to finishing off the extermination of its own kangaroo populations, until that total extermination is completed, there will always be a steady, inward trickle of young kangaroos, males sometimes accompanied by females, dispersing from their native mobs into the depopulated grazing land of ACT reserves.

Additionally, the kangaroos already present in the reserves are never confined to one reserve (except under experimental conditions like Mulligans Flat). Even though moving between reserves often results in collisions with motor vehicles, these daily movements are routine and observable.

There is no reason, based on current data, to assume that there ever were, or ever will be more than an average of three kangaroos per hectare present across the CNP. There is also no reason to assume that the richness and diversity of vegetation of the CNP reserves would, necessarily, begin to decline even when the number per reserve exceeds three per hectare, since we have insufficient data to consult on this matter.

The Kangaroo Management Plan

The Minister notes that the review will include a review the 2017 KMP. We would urge the Reviewer to carefully evaluate the KMP's assertions that kangaroos need to be managed at all (let alone killed) against the references provided in the Plan's own extensive Bibliography.

We have examined this Bibliography at length and find in it no convincing evidence that supports the Plan's assertion that kangaroos are having any deleterious impact on the ecosystems of the CNP, or on any individual species of the CNP. Some of the references in the bibliography are from the Directorate's own "spin" documents, which are not themselves referenced to any science whatsoever.

The CSIRO Plan Industries analysis of the Directorate's own data (Vivian, L & Godfree, R 2014), which is the closest thing currently available to a study that actually shows a relationship between kangaroos and biodiversity in the ACT, was available to the authors of the 2017 KMP in 2014. It is not even referenced in the KMP's bibliography, presumably because it did not support the KMP's pro-kill narrative.

The KMP and the Directorate's PR often refers to a selection of "eight papers" , referenced in the Bibliography, including the reptile study mentioned above (Howland et al, 2014). All these papers either share the flaws of the reptile study, or are highly ambivalent in their conclusions, not actually supporting the KMP's conclusions at all.

The superiority of the CSIRO Plant Industries analysis over the "eight papers" claimed by the KMP to support a kangaroo management program is twofold.

1. The CSIRO paper correlates kangaroo densities against a highly credible indicator of biological diversity (vegetative diversity and richness) rather than a misleading indicator such as mass or height of vegetation, or (the latest) a range of vegetative height purported to correlate to a vegetative structure which, in turn, is purported to correlate positively with the density of a single class of animal species which is not, itself, a plausible indicator of biological diversity.

2. The CSIRO paper covered all the reserves where data were collected, rather than just one or two reserves which might be not be typical or indicative across all the reserves of the KMP.

Even if these papers did unambiguously support the Directorate's and the KMP's position, the field of researchers represented by these eight papers (incidentally by only five authors and their various multiple-shared co-authors) is too narrow to be recognised as providing, collectively, a rigorous body of independent evidence.

As noted by Dr David Brooks (*Roogate*, in *The District Bulletin*, May 2016), the close association of the authors and co-authors, not only with each other, but also with the Directorate itself, raises serious doubts that any of these paper, individually, could be regarded as truly independent research.

Furthermore, the association of most of these authors with the ANU Fenner School suggests that these authors are actually "applied ecologists", not real ecologists at all. Applied ecology is a discipline that sits more properly in the field of agricultural science rather than ecology. Perhaps because of its anthropocentric roots in human food production, the Fenner School has a long and well-demonstrated history of advocating and developing techniques for killing sentient beings. It is a culture that regards animals as things to be disposed of at human convenience, rather than recognising them as both sentient individuals and contributing members of ecosystems.

Aside from urging that the relationship between KMP 2017's assertions and its bibliography be critical examined by the Reviewer, our overarching recommendation regarding the Kangaroo (Controlled Native Animal) Management Plan - which is a legislated instrument - is that it must, urgently, be repealed. Being law, this document currently mandates the cruel and unnecessary killing of sentient beings, and does so on the basis of unsupported assertions purporting to be science.

The culling calculator instrument

This is another legislated document, known to independent environmentalists as *Robokill*. It also needs to be abolished and repealed in its entirety, because it locks into law violent actions against sentient beings on the basis of three false assumptions. The kill numbers produced by these assumptions may be modified by "professional judgment based on observations and current research" but it seems unlikely that they could be modified sufficiently to compensate for the fact that all three legislated assumptions are simply wrong.

The false assumptions relate to:

- an estimated density of kangaroos per hectare (one per hectare in grassland, one per two hectares in woodland etc), that is considered to maintain the desired "conservation" environment under varying pasture growth;
- the estimated current population;
- a target number of kangaroos to remain after slaughter, based on a maximum population growth rate between slaughters that could be as high as 30%;

Robokill's first assumption, that approximately one kangaroo per hectare is desirable in any reserve, has been debunked by the CSIRO analysis of the Directorate's own data which showed that one to three kangaroos per hectare, on all the CNP reserves where data were collected, seems to be beneficial to biodiversity generally.

In addition to that, we have the ACT government ecologist's statement at ACAT in 2013 that "one per hectare" was "a guess" and "wrong". There is no reference in KMP 2017's bibliography that supports the Plan's assertion that "one per hectare" has somehow been promoted to "current knowledge".

In regard to *Robokill's* second assumption regarding the estimated population of kangaroos on the reserves, the Directorate's estimates of these numbers are generally based on sampling methods such as a walked line transect. The accuracy of these estimates has been disputed by comprehensively and scientifically recorded direct counts across entire reserves, undertaken by citizen scientists.

Robokill's third assumption is that, in a reserve where a large proportion of the kangaroo population has been slaughtered, the population growth rate could be as high as 30% per year. This is, in fact, biologically impossible.

Kangaroos are slow breeding animals. They bear only one joey a year, and those joeys remain dependent on their mothers for 18 months. This means female kangaroos often have both a pouch joey and an at-foot joey (a year older) in their care at the same time.

Kangaroos do not conceive, or form sperm, unless green feed is available. If feed becomes scarce after a joey is conceived, diapause (suspension of the development of the new joey) is

triggered until environmental conditions improve. Female kangaroos are not mature enough to produce healthy young of their own until they are two years old (Dawson, T, 1973-2012).

Where any animal species is routinely slaughtered in large numbers on an annual basis, the average age of the survivors will obviously be considerably younger than in a natural population. With animals that breed litters and/or breed more than once a year, this kind of sustained lethal control will (counterproductively) maintain in perpetuity a higher population. However, with kangaroos, relatively few of the survivors will be both female and of safe breeding age.

On top of this, there is the high infant mortality rate. Numerous studies have shown that most Eastern Grey Kangaroo joeys are taken by foxes. Canberra, as we all know, certainly has foxes. Furthermore, many juvenile kangaroos are killed by fast-moving vehicles on the deadly multilane highways that separate the reserves.

At ACAT 2013, when the Directorate was called out for assertions of impossible kangaroo population growth rates, the government ecologist claimed the growth was due to inward migration. This was sophistry at its worst. Repopulation of a depopulated reserve by kangaroos from other reserves, or from non-reserve land, or from rural NSW, cannot in any logic be classed as population growth since it still represents an overall depletion in the number of kangaroos remaining in the local region.

The sophistry of the government ecologist's assertion is further underlined by the fact that he used the exact opposite assertion to support the killing of kangaroos four years earlier at ACAT 2009. Dr Dan Ramp had argued that killing 5000 kangaroos on the Majura Defence Force land would be ineffective in fairly short order because the vast kangaroo habitat adjoining the Defence Force land would supply ongoing migration into the emptied Defence Force land. On that occasion, the same government ecologist responded that kangaroos are sedentary and rarely leave their home range.

The three fundamental errors in the assumptions built into the ACT Kangaroo Kill Calculator can only result in a devastating impact on kangaroos numbers across the ACT. There is a distinct risk that, coupled with the NSW's Governments' withdrawal of all regulation of kangaroo killing licences in NSW, this will ultimately lead to the extinction of the Eastern Grey Kangaroo species across the region. Extinction could occur either directly from the sheer scale of the annual shooting, or more slowly from the impoverishment of the regional gene pool which will be the inevitable outcome of the scale of the shooting.

Independence and expertise of the reviewers and their advisers

We are deeply concerned that the Reviewer will judge that recommending an end to the killing of kangaroos in the CNP is beyond her brief, despite the overwhelming science supporting its ending, and the remarkable absence of science that justifies the killing.

We are also concerned that the Reviewer might call upon alleged experts to advise her, and that these "experts" might be the same individuals whose erroneous advice has misinformed assumptions about kangaroos in the ACT (and other jurisdictions) over the last 20 to 30 years. We strongly urge the Reviewer to seek advice from a wide pool of genuinely independent ecologists, avoiding the ANU clique, and those who are beholden to the ACT government, and those who are immersed in the killing culture of the Fenner School.

We note that the last time the ACT government claimed to have conducted an independent peer review of its kangaroo slaughter program, they engaged a commercial pest extermination firm from NZ, a company which not only had a commercial vested interest in the philosophy of killing animals deemed to be "pests" but also absolute zero knowledge, expertise or experience concerning kangaroos.

It is this kind of con job that tends to make well-informed and intelligent people cynical about the ACT government's so-called independent reviews.

My credentials

My academic background is in social and environmental science. My professional experience in environmental science and policy includes developing meaningful and measurable indicators for Australia's Headline Sustainability Indicators, and for Australia's State of the Environment Reporting (SoE). I compiled, analysed, evaluated and critiqued the data and research available to populate meaningful indicators in relation to the SoE themes of: land; oceans; biodiversity; and inland waters. On the strength of my work on SoE, I was engaged to assist the United Nations Regional Office for the Pacific and East Asia in a project to develop coastal environmental indicators for the region.

My interest in the environment grew out of my concern for animals. I began rescuing animals, and advocating for animals as individual sentient beings 60 years ago. Concurrently with my career in social and, later, environmental science and policy, I served ten years on the Animals Australia executive committee, fifteen years on the Animal Liberation ACT Committee, and nearly 18 years on the Animal Welfare Advisory Committee (AWAC) to the ACT Government. Now retired from the Australian Public Service, I am co-founder and environmental adviser to the Animal Protectors Alliance.

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