



Dr Maxine Cooper  
Commissioner for Sustainability and the Environment

Dear Dr Cooper

**Questions sent to Sharon Lane by Pamela Mathie on 7<sup>th</sup>, 8<sup>th</sup> and 12<sup>th</sup> February 2008**

This letter attempts to clarify the position of the Department, in regard to both kangaroo fertility control research, and the Belconnen Naval Transmitter Station (BNTS) and in doing so, respond to your detailed questions. It also addresses the application from the Invasive Animals Co-operative Research Centre (IACRC) to join the project in order to trial the GonaCon® vaccine.

***Fertility Control Research***

Since 1998 the ACT has committed resources to an attempt to develop an effective means of controlling the fertility of free ranging populations of eastern grey kangaroos. To develop effective fertility control is no easy task, and requires a long-term commitment. In Australia, there are four research groups working on kangaroo fertility control, based in four universities and CSIRO. The control of kangaroo populations is important for (a) conservation of threatened grassland and woodlands, (b) for community safety particularly in relation to car collisions with kangaroos, and (c) controlling impacts on rural production.

The ACT has linked itself to those researchers whose fertility control products are intended ultimately for delivery in food. A non-lethal, oral contraceptive (i.e. a food-based delivery method) for controlling kangaroo densities is highly desirable because (a) the main kangaroo control method used at present, shooting, is unsafe in many urban areas, (b) non-lethal solutions are more socially acceptable, (c) oral delivery will be the most cost-effective method, and (d) oral delivery is likely to be the only feasible method for controlling population growth of wild, free-ranging kangaroos. Fertility control products which require each kangaroo to be darted (eg implants) are unlikely to be cost-effective for controlling free-ranging populations. The delivery of effective fertility control in food is the ultimate goal.

For the future benefit of the ACT, I am keen that the most promising of fertility control products currently available should be trialled in eastern grey kangaroos, including, but not limited to, the Zona Pellucida (ZP) vaccine currently on trial at BNTS. The most promising product appears to us to be the GonaCon® GnRH vaccine which has recently been allowed into Australia from the USA for research by the IACRC. To trial that product, and also continue the current research on ZP vaccines, I advise you that an additional 40 female kangaroos would be required.

In your email on the 7<sup>th</sup> you refer to discussion with Ms Lane of three phases of the current fertility control research project in which Parks, Conservation and Lands (PCL) is engaged. These conceptual phases are not formally documented but were explained as follows to enable you to understand the nature of the work being conducted and planned:

- Phase 1: developing and trialling a successful fertility control substance such as that currently being applied at BNTS, or a more robust version now undergoing laboratory trials;
- Phase 2: research into feeding preferences of kangaroos to design a bait for delivering a vaccine in food; and
- Phase 3: testing the population level effect of the vaccine in food.

Phase one has been underway since 1998 and is continuing. Phase two has commenced. Both phase one and two are active at BNTS.

***The Importance of BNTS for Kangaroo Research***

In order to facilitate research on eastern grey kangaroos, including research on fertility control, access to a site such as BNTS is invaluable to the ACT. The BNTS site is exceptional for fertility control research because of its convenient size, open grassland vegetation, 'people-proof' security fence, and urban location. A site like this is essential for the first 'real' deployment of fertility control vaccine in food, when it is developed. For example, the quarantine approval of one of the vaccines, at this pre-registration stage, requires a securely fenced site. Research institutions which the ACT may partner in the quest for effective fertility control products and methods, such as the Marsupial Research Laboratory at the University of Newcastle, and the Invasive Animals CRC (IACRC), do not have ready access to extensive tracts of land, and depend on agencies such as ours and Defence, to facilitate access to kangaroo populations and sites such as BNTS.

If BNTS is transferred to the ACT Government, it is expected that the 100 hectares of Natural Temperate Grassland will be reserved for nature conservation. In accordance with legislation, all of the ACT's conservation areas are available for research purposes (as well as conservation, education and recreation) and I expect that the Department will continue to conduct kangaroo and grassland research on the site.

***Research Animals at BNTS***

At BNTS, PCL currently has three treatment groups, each of twenty females (all ear-tagged) as well as seven males, comprising 67 kangaroos tagged. The tagged males are relevant only to the pellet feeding experiments and can be disregarded for purposes of the following explanation. Additional untagged male kangaroos 'participate' in the project by mating with the tagged females. The tagged animals and the unknown number of males are part of a collaborative research project by the University of Newcastle, Defence, a private biotechnology company in New Zealand, and Parks Conservation and Lands (PCL). The current agreement with the University expires at the end of this year. However, the University is in the process of sourcing additional funding to continue the research.

Previous advice provided by Ms Sharon Lane suggested that a minimum number of 56 kangaroos would be required to continue the fertility control project with the Marsupial Research Laboratory, plus 30 more to add the two GonaCon treatments, which would be highly desirable from an ACT Government perspective. These numbers had been estimated at short notice by Dr Fletcher. However, further consideration and consultation has resulted in some modification to that advice, as follows.

Discussion with Dr Lyn Hinds, one of the leading fertility control researchers, has caused PCL to reconsider. Dr Fletcher had based his calculation on an estimated 'absolute

minimum' number of 15 females in each treatment group but Dr Hinds argued persuasively that to start with this number is accepting too high a level of risk, and that the size of each treatment group should continue to be twenty. In either case, the number of males should be at least 20% of the number of females. Therefore the number of kangaroos needed, is the number of experimental treatments (5) (including an experimental 'control' or untreated group), plus 20% males i.e. 20 males. Five treatments x 20 plus 20% = 120.

The minimum number of kangaroos per treatment depends on the likelihood of animals being lost from the experiment, which depends on site characteristics such as the quality of fencing, vegetation type, fox abundance, and level of public interference. Dr Fletcher's estimate was that 15 females per treatment was acceptable, based on his experience at BNTS in 2005-2007 where few losses have been experienced. (He also assumed a lower number of males, 16 rather than 20, assuming they were hand picked, and replaced at intervals.) However, Dr Fletcher acknowledges that there have been higher losses from the enclosures at Tidbinbilla (due to escapes etc), and that a higher rate of loss appears to be typical of this type of research. Dr Hinds would prefer to see research of this type of research start with groups of twenty females as a buffer against losses.

Therefore, to allow the current research program to continue and to support the very promising IACRC work (which I believe to be extremely valuable), our current advice is that all of the tagged females at BNTS (60) should be retained to successfully continue the current project, plus an additional forty females to test the GonaCon vaccine, plus twenty males, i.e 120 kangaroos on the site. All of these kangaroos would presumably be captured as a by-product of the population reduction operation (which involves capture-darting).

*Uni Newcastle/ PCL/ Defence project*

- 20 untreated experimental 'control' females (already tagged)
- 20 females that have had an initial vaccination by injection (already tagged)
- 20 females that have had an initial vaccination by mouth (already tagged)
- 12 males (7 already tagged)

*IACRC/PCL project*

- 20 females (to be given one injection of GonaCon vaccine)
- 20 females (to be given one injection and a subsequent injection of GonaCon vaccine)
- Additional 8 males

The IACRC project would use the same 20 untreated experimental 'control' females as the University of Newcastle project.

Both projects would continue for three years. The duration of infertility is an extremely important determinant of effectiveness and is expected to be about three years for both vaccines, but this has never been assessed.

***Stocking Rates for Kangaroos at BNTS***

I understand that your independent panel has advised that all of the kangaroos should be taken off the site for two years.

I have obtained advice from applied ecologists in my department who have been recognised for their expertise in grassland ecology, (Dr Don Fletcher, expert in dynamics of eastern grey kangaroo populations and their food supplies, and Ms Sarah Sharp, expert in conservation of native temperate grasslands and woodlands). Both scientists frequently interact with managers, and are accustomed to the need to accommodate multiple objectives. They have advised me that a significant reduction in kangaroo density is essential to prevent severe damage to the pasture predicted in future, and to allow the grassland vegetation to recover from the damage incurred to date from the drought and over-grazing by kangaroos. Dr Fletcher and Ms Sharp agree that the reduction in grazing pressure that will be brought about by reducing the kangaroo density from the current level of approximately five kangaroos per hectare, to approximately one kangaroo per hectare, will have clear benefits for the grassland, and is likely to provide an acceptable management regime with which to move forward. They recommend for the long term an adaptive management approach in which the number of kangaroos is adjusted up or down based on measurements in the herbage mass and vegetation condition. Both scientists acknowledge the importance of reducing the number of kangaroos below the number required for fertility control research, if that is proved necessary, but the value of the fertility control research is high, and it should be protected if possible.

Previous correspondence to your office provided by Ms Sharon Lane (31 January), commented that the recommendation to totally destock the site is contrary to our understanding of current scientific knowledge. Dr Graeme Coulson (2001) has concluded that about 1 kangaroo per ha is a sustainable level. An independently derived empirical model by Dr Fletcher supports Dr Coulson's conclusion. Clearly, the current population of approximately 590 kangaroos far exceeds the recommended carrying capacity of the site (which at approximately 1 per ha is approximately 116 kangaroos). There will be a great improvement if the population is reduced to the estimated sustainable population level.

In relation to any growth in the kangaroo population on the site, over and above the number of animals being used for research, the population would be controlled by the removal and euthanasia of pouch young as is standard practice for the management of research animals. This will be undertaken by capture darting and euthanasia.

#### ***Fencing Proposal***

You requested information on the cost of fencing to enclose a number of kangaroos as an alternative to the current site. The existing fence at BNTS would be expensive to replace, and not surprisingly, the cost estimate we provided for a smaller alternative was in the hundreds of thousands of dollars.

Your response (in the email of 7 February) was to suggest that the research kangaroos could be moved to a much smaller area where they were confined at the same density as currently applies at BNTS. Our previous advice was that about one kangaroo per hectare is an acceptable stocking rate. Anything well above this stocking rate would change the nature of research from trials on a free-ranging population to trials on penned animals fed on pellets. We have not costed the management of the 'small pen' alternative in which the kangaroos were confined at high density and fed artificially.

Research on a new fertility control needs to demonstrate that any effect is from the medication. Either translocation or close confinement have the potential to disrupt breeding

and are therefore a threat to the research, or a source of delay. Continuing the research on the existing site as it is currently set up, would result in the best outcome for the research projects and allow the research to continue without delays or interruption.

Additionally, any research undertaken in a penned environment requires the cost of the food (standard macropod pellets) and staffing to be added, which would be likely to offset the cost of fencing the larger area.

In regard to your supplementary email of 12 January, asking how quickly a fence could be built at BNTS around kangaroo research enclosures of 11 ha and 56 ha, if the enclosures were inside the BNTS fence there would need to be consideration of the impact on the grassland of supporting a high density of kangaroos in the enclosure for a sustained period, by artificial feeding. Also in that case, the Department of Defence should be approached for information about the time required for their approval and budgeting processes. If the enclosures were outside the BNTS fence, we might need approval from the ACT Planning Authority, and our experience is that this could take some time. Fencing contractors indicate that when the time came, the fence could be built in a matter of weeks, depending on details of its specification, materials, alignment, etc.

#### ***Kangaroos Outside the BNTS Enclosure***

In your email of the 8<sup>th</sup> January you enquired about the management of kangaroos outside of the BNTS enclosure. The area outside the enclosure does not contain an endangered ecological community and therefore the long-term ramification of grazing pressures is not an ecological issue of concern. The fate of these animals when suburban development proceeds will be similar to kangaroos in other areas of Canberra (such as Gungahlin) where suburban development has been extensive, ie. the constant disturbance of people and machinery will cause the kangaroos to disperse into other areas.

Currently, Parks Conservation and Lands are preparing an ACT Kangaroo Management Plan to define policies and actions for the management of kangaroos throughout the Territory. The issue of controlling and managing kangaroo populations in the urban area and kangaroo fertility control research will be a central theme of this plan.

#### ***Recommendations***

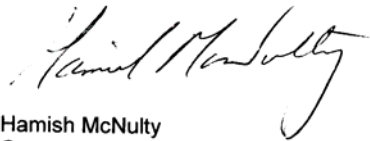
I fully agree that the grassland at the BNTS needs to be given a rest from the excessively heavy grazing regime inflicted by excessive number of kangaroos on the site. The government has been pressing for this outcome for some time now. It may well be that in an ideal situation, for example a sheep-grazing property, that all the stock be removed. In the case of BNTS, however, I propose that an alternative approach is justifiable for the following reasons:

- a) kangaroos on the site are important to the collaborative research program and in the interests of that program continuing uninterrupted and allowing a supporting trial to be undertaken, a sustainable number of kangaroos should be retained;
- b) the site has a long history of grazing (before kangaroos it was grazed by domestic livestock) and therefore the grasslands and associated species that persist there are accustomed to grazing and need some form of biomass control (grazing, slashing and/or burning) to retain their ecological function;

- c) reducing the kangaroo density approximately 4-fold would significantly reduce the effects of grazing on biomass and thus should allow for significant recovery of the grassland;
- d) allowing a sustainable stocking rate to be retained on the site provides the opportunity to monitor the effects of destocking and hence allow for adaptive management to proceed;
- e) allowing a sustainable number of kangaroos to remain on the site will negate the need to reintroduce kangaroos later;
- f) allowing the continued use of BNTS would avoid the costly and difficult exercise of setting up a similar research facility elsewhere in the ACT; and
- g) if the BNTS site was to be unavailable for kangaroo fertility research, I expect that the research projects (current and proposed) will be delayed or put at risk, compromising our attempt to progress evidence-based kangaroo management..

Thank you for your emails in relation to the above matters. I trust that this information is of assistance to your inquiry.

Yours sincerely



Hamish McNulty  
Conservator of Flora and Fauna  
Executive Director, Environment and Recreation

Date 14/2/08