

## **Kangaroo Grazing in the Aranda Snow Gums Heritage Site.**

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The Snow Gums area below Aranda Bushland is a frost-hollow grassland surrounded by mainly Yellow Box/Blakelys Red Gum grassy woodland. Walking in the area disturbs groups of 10-20 Eastern Grey kangaroos, and there will be perhaps 4 or 5 groups visible from a central point in the evening. They graze each day in the Snow Gums and adjoining areas, and rest under the eucalypts.

It has been clear to us from the time when we began planting *Themeda* (kangaroo grass) to try and improve the grass composition in the Snow Gums area, that we had formidable opposition. The roos systematically pulled out all our plants, eat the leaves and rejected the roots. Providing protection was not much help, they still ended up eating all our planted grass!

To try and get a better understanding of the issues we did two activities. The first was to carry out two sweep-counts of roos. Our area is bounded by three high-speed roads and the suburb. We began the sweep from William Hovell Drive to the south, and proceeded north slowly in an open extended line of observers. We counted the roos coming back past the line. In a discrete area like ours the only roos that can be missed had to cross the roads, and CNP rangers were patrolling the roads to turn them back. I did not hear of any roos that tried to cross, which fits with the concept that they are very local and territorial. Road deaths of roos on our high speed roads are relatively few considering the abundance of animals.

We counted 163 Eastern Grey roos on 4<sup>th</sup> Sept 2005, and 196 on 21<sup>st</sup> July 2010, plus some swamp wallabies. This implies a relatively stable local population, with death rates matching birth rates. The Eastern Grey female breeds from about 2 years of age and lives to be 10 to 15 years old. About 80-90% of adult females have viable young every year. The sex ratio is heavily in favour of females, with only a small proportion of males becoming breeding animals. In 180 roos, we can assume that 100 are breeding females, and a large proportion of the rest are juvenile males and females. On this basis the birth rate in our population is around 80-90 young roos each year, and in a stable population birth rate equals death rate. In Eastern Grey roos death rates peak sharply at around 2 years of age in late winter and spring (For background see ACT Kangaroo Management Plan, 2010).

The cause of this high death rate is a combination of physiology, climate/feed and intestinal parasites. A breeding female will have a very young joey on one teat, and a pouch young feeding from another. She may even have a dormant blastocyst waiting in her uterus. The older young remains feeding from the mother's teat until about 18 months of age, as well as eating grass. From 18 months the young are entirely dependant on grazing, and have a light body frame and large surface-area to body weight ratio. This means that their energy demand is high. When this coincides with late winter/early spring at 2 years of age their survival depends on good feed. In the Snow Gums area there is almost no feed in late winter and ground temperature reaches minus 10 C or less on cold nights. Most of the young die of starvation, as do very old males.

The dead are rapidly eaten by foxes and crows, who are also very hungry at this time of year. Walking round the area in early spring shows numerous fresh roo bones scattered in the grasslands.

Aranda Bushland has never been a site for culling of kangaroos, so the events which I have described are simply the natural consequences of high population density and seasonal food scarcity. The populations of roos in ACT Parks vary from about 5 per

ha to below 1 per ha. . The overall area of this grassland and grassy woodland is about 50 ha, with the Aranda Bushland itself a further 120ha. of dry sclerophyll forest. If we average our roo numbers, there are about 1 per ha over the whole area, but of the whole area only about 20ha is top quality roo grazing. Even in the frost hollow itself much land is occupied by sedges which are not palatable to roos. This means about 8 roos per ha grazing on the top palatability pastures, and 3.6 per ha overall in the grassy locations.

Rainfall will obviously affect vegetation growth and hence roo survival, however the six and twelve month rainfalls prior to our roo counts do not indicate any relationship to the number of roos. In 2005 the 12 month figures were 659mm and 6 month 364mm. In 2010 12 month figures were 544mm and 6 month 314mm. This would imply possibly better vegetation in 2005, though there were less roos. Nor does consideration of the drought years assist understanding, as the peak drought of 2004 was almost replicated in 2009, the years prior to our numbers. The only implication from the different numbers from our roo counts that I can draw, and this is just speculation, is that a July count may exceed a September count, as the main die-off of roos is in September.

To see just what impact this grazing has on our grasslands, Dr. Don Fletcher and Ms Claire Wimpenny with myself and two other Friends of Aranda Bushland members, Jim Arnold and Roy McAndrew, set up five pairs of exclosures, one of each pair to allow rabbits and exclude roos and the other to exclude both. This was done in June 2010. The open mesh hinge joint exclosures to allow rabbits to graze were damaged by roos pushing their heads through almost immediately, but the weldmesh exclosures keeping both species out are still working well.

The exclosures and nearby control areas were photographed in August 2011, November 2011, March 2012 and August 2013. The five sites are located in quite different areas of the rural lease and Snow Gums grassland.

To get an impression of the heavily grazed grasses, the photo below is representative of the land surface at Site 5. There are a few live leaves close to the ground, but most of the area is dead grass, with some tufts of kangaroo grass (*Themeda*) which have been pulled out by grazing. The ground shows many roo droppings, fresh and old. In this paddock the *Poa* clumps have also been heavily grazed.



Detail of groundcover adjacent to site 5 Aug 2013. Numerous roo droppings and dead tufts of *Themeda* pulled out by kangaroos.

Examination of the species of grass in the exclosures showed almost all *Themeda* in Sites 5 and 6, showing a basically *Themeda* paddock.

It is not possible to separate rabbit grazing from roo grazing in this experiment, but there are no active warrens within the CNP boundary of the Snow Gums area.

Unfortunately in the rural lease there are active warrens, about 200-300 metres from exclosures 1, 2, 5 and 6, so some of the grazing pressure may come from rabbits.

The long-term effects of continued heavy grazing of *Themeda*, to the extent that it does not flower at all, will be detrimental. Areas formerly of *Themeda* are being replaced by Patterson's Curse, requiring spraying, and leaving bare ground to be colonised by annual weeds. As the native pasture cover deteriorates, St. John's Wort invades, as is clearly illustrated by our photographs.



Aug 2013 Site5. Late winter with heavy grazing by roos.

This also requires spraying. The native forb understory is sensitive to spraying, even with selective herbicides, so that ultimately the biodiversity is damaged.

Friends of Aranda Bushland are considering what action to take to allow the *Themeda* in the most grazed paddocks to flower and hence regenerate and survive, as at present it does not flower outside our exclosures. We are considering constructing areas protected by rabbit/roo proof fencing, so there is natural seeding and survival of native grasses.

An appendix sets out the technical detail of the experiment, and this with a comprehensive photo set can be provided as a CD if requested.

