Best Practice Rabbit Management in Upper Werribee Catchment

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In a survey of South Eastern Australian vegetation biodiversity, losses due to rabbits were widespread and affecting a large proportion (88-95%) of native plants classified as either endangered, vulnerable or depleted[1]. Research has shown that less than one rabbit per hectare can prevent the regeneration of many common native trees and shrubs[2].

Preliminary analysis from recent investigations across Victoria of rabbit damage to native seedlings within different ecological vegetation communities demonstrates that rabbits at low densities i.e. one rabbit per two hectares, are affecting native vegetation by removing the majority of regenerating seedlings such as callitris, bursaria, casuarina, podolepis, many acacia, and some eucalypts.

The rabbit is the filter through which all plants must pass[3] with palatable species being removed first, then the next most palatable, until the landscape becomes dominated by the least palatable invasive species that have toxins or spines.

In response to these findings a project was initiated in Ingliston (near Ballan) by the Port Phillip and Westernport CMA, Melbourne Water, Department of Environment and Primary industries, Parks Victoria and a private landholder to demonstrate best practice rabbit control.

Site description

Within this landscape, excessively high numbers of rabbits have not been managed in over two decades. Steep stream valleys dissect the landscape and exposed granite outcrops lead to gravelly, well drained soils which provides ideal conditions for the construction of numerous warrens. The majority of these warrens are situated in difficult terrain where they can be costly to destroy.

The recommended livestock carrying capacity of the farm is around four sheep/ha. However, 35% of the farm is highly rabbit prone with the grazing pressure from rabbits being equivalent to seven sheep/ha. Spotlight counts peaked at an average of 85 rabbits/km and within the rabbit prone areas there are 6-11 warrens/ha or 38 warren entrances/ha.

March 2009 – excessive grazing by rabbits and stock. In this particular location there was evidence of 190+ rabbits per spotlight km, with only cyclic rabbit baiting in use.

The landscape is highly degraded, with almost no natural regeneration of native plants. In most seasons no vegetation exists within the eroded gullies, resulting in the erosion of silt into the Werribee River.

[1] Cooke, 2008.
[2] Denham & Auld, 2004; Sandell, 2006; Cooke, 2008; Murdoch, 2007.
[3] Williams et al, 1995.

Best practice rabbit management approach
In the past we have killed large numbers of rabbits but have not effectively controlled their numbers. Rabbits have the ability to rapidly recover if their numbers are not reduced by more than 95%. Successful management relies on initially reducing rabbit populations to low levels and then to manage low populations at low effort and low costs. Warrens are crucial for the survival of rabbit populations. Management programs based around warren ripping have reduced rabbit populations by 80-97% for up to 12 years.
Over 50 years of research has demonstrated that rabbit management procedures are simple, well defined, and actually work. They involve combining the following control measures at the most appropriate time, in autumn during the non-breeding season, when populations are at their lowest.

Steps for the long-term maintenance of low rabbit populations

1. Plan to set objectives and define an area for rabbit control, always using a combination of control techniques.

2. Initial knockdown
- Use bait to reduce rabbit numbers prior to warren ripping
- Destroy warrens and remove surface harbour e.g. boxthorn, black berry, rock and piles of rubbish.

3. Maintenance control
- Re-rip re-opened warrens
- Fumigate re-opened, inaccessible or missed warrens
- Spot bait warren areas that cannot be ripped or where hot spots occur post ripping.

4. Monitoring
- Monitor the costs of the program
- Monitor the effectiveness of the program (impacts on rabbit abundance and biodiversity) to adjust and refine the techniques.

The initial investment in managing rabbits may appear high but given the potential for a sustained reduction in rabbit populations for at least 10 years, it is expected that the return on investment would be substantial.

Landscape restoration following rabbit removal
The success of the Ingliston rabbit control project was measured in terms of the survival of planted native seedlings. To demonstrate restoration of native vegetation, five 1 hectare plots were deliberately excluded from the control works, leaving areas of high rabbit density. These were compared to five similar areas with low rabbit densities to assess the impact of rabbits on the growth and survival of native seedlings: Drooping Sheoak, Allocasuarina verticillata, Golden Wattle, Acacia pycnantha, Manna gum and Eucalyptus viminalis. Within each plot, 60 seedlings of each species were monitored, with guards placed around half the seedlings to completely remove browsing by pest animals.

Above: Typical damage to seedlings by rabbits recorded eight days after planting. Manna gum (left) pruned and not eaten (typical clean oblique cut) and Drooping Sheoak (right) dug out and partially consumed.

Measuring native vegetation response
One year into the rabbit control works, follow-up measurements were taken and indicated:

- 90% survival of guarded seedlings
- 35% survival of unguarded seedlings where warrens were ripped (low rabbit abundance)
- 10% survival of unguarded seedlings where warrens were not ripped (high rabbit abundance)

April 2012 - major rabbit management works complete. Stock has been excluded and rabbit numbers have been reduced to 0.5-1 rabbits per km using baiting, warren ripping & fumigation.

Summary
This project further demonstrates that well-defined procedures for managing rabbits can be very successful, when the correct control measures are combined and put into practice at the most appropriate time of year.

As a result, a high density rabbit population located in a difficult terrain has been reduced by 94% over 12 months and maintained at those levels for 2 years allowing native regeneration and survival of planted vegetation.