

# Protecting your patch: What is the value of a fence?

## Patch protection: What are the benefits of fencing remnants?

Patches of remnant native vegetation on farms are valued by landholders for many reasons. They form an important part of the landscape, help to manage salinity and erosion, provide shade and shelter for stock, contribute timber and firewood as well as provide habitat for wildlife and native plants.

Over the last decade many landholders have taken part in incentive programs to fence their remnant patches. The goal of these programs was to control stock grazing to encourage the conservation and regeneration of native plants.

Despite the large investment in these programs there are still questions around the benefits of fences for native vegetation, such as:

- Does fencing improve the condition of native vegetation and species diversity?
- Is controlling stock grazing alone enough to encourage regeneration of native species?
- Can fencing assist in controlling weeds in native vegetation remnants?



## Key findings of Patch Protection

- 1 Fencing and controlling stock grazing can improve the condition and diversity of native vegetation remnants.
- 2 Fencing and controlling stock grazing can increase regeneration in native vegetation remnants, **but**
- 3 Not all bush remnants respond to fencing in the same way. Some vegetation types had greater native species diversity and regeneration after fencing than others.
- 4 Regeneration in vegetation remnants also varied among species. Some species, such as Yellow Box and White Box, did not regenerate even after fencing. This suggests that other factors such as disturbance may be needed to trigger regeneration of these species.
- 5 Fenced remnants did not always have less exotic species. This suggests that crash grazing or other management may be required to control weeds in fenced remnants.
- 6 The majority of landholders thought that fencing remnants was worthwhile and improved the overall environmental quality of the farm.

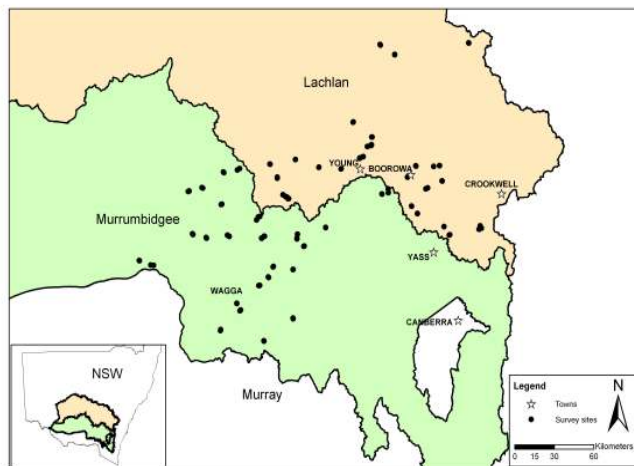
## Introducing the Patch Protection project

To answer these questions around the value of fencing remnants to control grazing, researchers at Greening Australia, CSIRO and the NSW Department of Environment and Climate Change (DECC) recently investigated vegetation condition in fenced and unfenced remnants in the mid to upper Murrumbidgee and Lachlan catchments of southern inland NSW. This research was funded by the NSW Government through its Environmental Trust.

### Patch Protection: What, where and how?

Sixty sites (30 in each catchment) were selected from the 1300 remnants that had been fenced between 1998 and 2003 by incentive programs in the Lachlan and Murrumbidgee catchments. Sites were selected to represent four different vegetation types:

1. **Dry sclerophyll forest (DSF)** which was dominated by species such as Red Stringybark, Mugga Ironbark and Long-leafed Box (Bundy or Hill Apple) (18 sites),
2. **Grassy woodland (GW)** which contained White Box, Yellow Box and Blakely's Red Gum (21 sites),
3. **Plains woodland (PW)** which was dominated by White Cypress Pine, Grey Box and Yellow Box (16 sites), and
4. **Hills woodland (HW)** which included Tumbledown Gum, Dwyer's Red Gum and White Cypress Pine (4 sites).



To look at the effect of fencing on regeneration and remnant vegetation condition, two plots were established at each site, one inside and one outside the fence.

In each plot measurements were made of the tree overstorey, shrub midstorey and groundcover (including plants, rock, litter and bare ground), regeneration, tree health, tree hollows and fallen logs. All sites were surveyed in late 2005, 2 - 7 years after fencing.



Fenced



Unfenced

### What are the benefits of fencing and controlling stock grazing?

Overall, fenced remnants showed higher native species diversity and better vegetation condition than unfenced remnants. In fenced remnants there was:

- Greater native species diversity (number of species)
- Greater cover of native grasses, forbs and shrubs
- Less bare ground, and
- Greater tree regeneration.

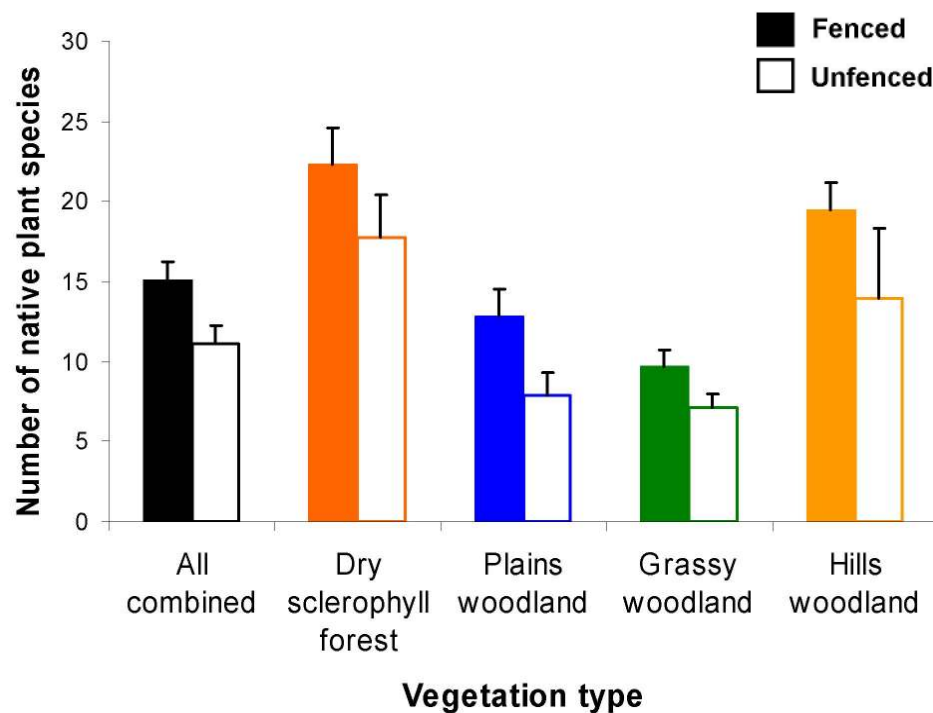
## But not all bush is the same

Despite the overall higher levels of native species diversity, native ground cover and regeneration, the results of fencing vegetation remnants to control grazing differed between vegetation types. This suggests that the outcomes of fencing can vary depending on the type of vegetation and that additional management may be required to improve the condition of particular native vegetation remnants.

### Key Results of the Patch Protection research

#### *Native Species Diversity*

- Including all vegetation types, native species diversity was higher in fenced remnants.
- For both fenced and unfenced plots, native species diversity was highest in dry sclerophyll forest and hills woodland and was lower in grassy woodland and plains woodland.
- Despite differences between vegetation types in the overall number of species, fenced remnants had higher native species diversity in all vegetation types.
- In fenced sites, native species diversity was highest where there was no stock grazing and in sites which had been fenced for the longest time.



**The number of native plant species (species diversity) in fenced and unfenced vegetation remnants combining all vegetation types and for each individual vegetation type.**



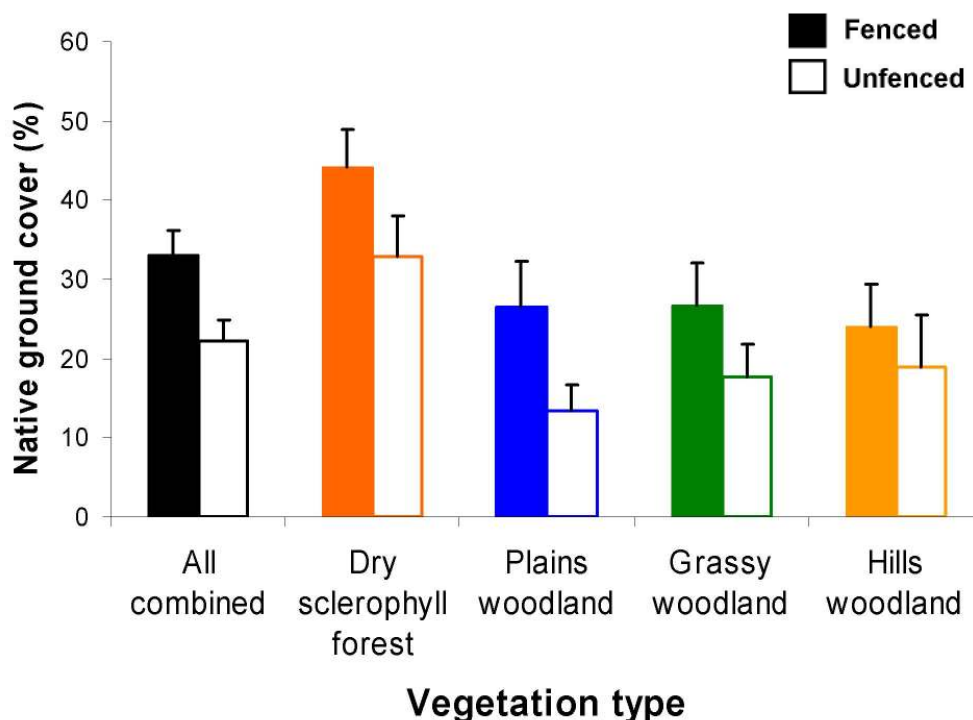
**Fenced**



**Unfenced**

## Native Ground Cover

- Combining all vegetation types, native ground cover was higher in fenced remnants.
- For both fenced and unfenced plots, native ground cover was highest in dry sclerophyll forest and lower in the woodland vegetation types (plains woodland, grassy woodland and hills woodland).
- Fenced remnants had higher native ground cover in all vegetation types, with the greatest difference in native ground cover in dry sclerophyll and plains woodlands.



The percent cover of native ground cover species in fenced and unfenced vegetation remnants combining all vegetation types and for each individual vegetation type.

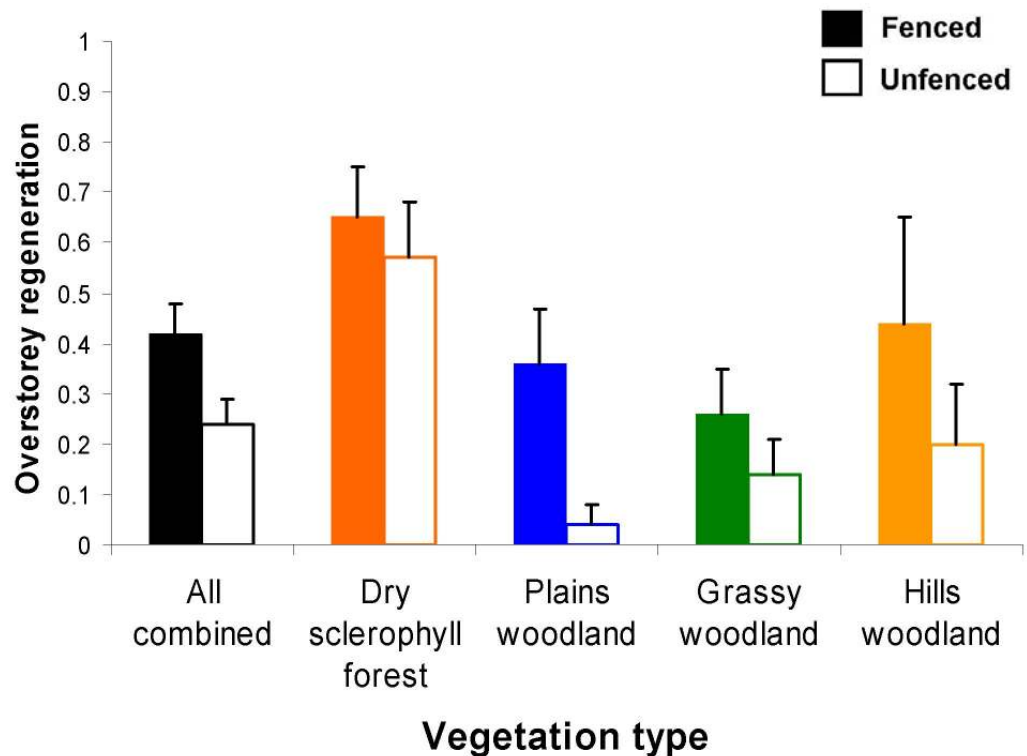


## What about shrub diversity and regeneration?

- There was no difference in native shrub diversity in fenced and unfenced sites combining all the different vegetation types.
- Shrubs were only present in 40% of the sites (16 fenced and 8 unfenced sites), which partly reflects the low occurrence of shrubs in the plains woodland and grassy woodland vegetation types. But...
- The absence of shrubs in other vegetation types may indicate a history of grazing prior to fencing.
- Shrub regeneration was only present in 25% of sites (11 fenced and 4 unfenced sites). This suggests that, even after fencing, other factors may be required to trigger shrub regeneration.

## Tree regeneration

- Including all vegetation types, tree regeneration was higher in fenced remnants.
- In some vegetation types, such as plains woodland, fencing had a large effect on tree regeneration, so that fenced sites showed much higher regeneration compared to unfenced sites. In contrast, for dry sclerophyll forest tree regeneration was high regardless of fencing.



**Tree regeneration in fenced and unfenced vegetation remnants combining all vegetation types and for each individual vegetation type.**

The response of individual species to fencing can explain some of these differences in regeneration between the vegetation types, as tree regeneration patterns in the different vegetation types largely reflected regeneration patterns of the main tree species. When regeneration of the different tree species were analysed separately, three different responses were found:

- **Trees that regenerated in both fenced and unfenced plots across a number of sites:**
  - Blakely's Redgum
  - Tumbledown Gum
  - Long-leaved Box
  - Red Stringybark
- **Trees that regenerated at few sites, whether fenced or unfenced:**
  - White Box
  - Yellow Box
- **Trees that regenerated in fenced plots, but not in unfenced plots across a range of sites:**
  - Black Cypress Pine
  - White Cypress Pine
  - Grey Box
  - Mugga Ironbark



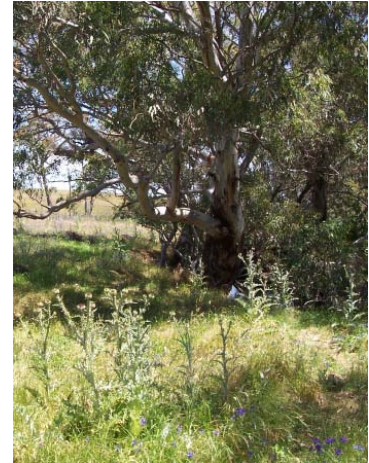
## How to manage your remnant?

### Step one: Fence the remnant and manage the stock

Overall, fenced remnants with managed grazing showed greater native species diversity, native ground cover, and tree and shrub regeneration compared to unfenced remnants. This indicates that fencing can improve the condition and diversity of remnants as well as encourage tree and shrub regeneration.

#### ***But..... Just a fence may not be enough***

- Exotic ground cover was not always lower in fenced remnants, and in grassy woodlands and plains woodlands it was actually higher than in unfenced remnants.
- 45% of fenced remnants showed no tree regeneration.
- Yellow Box, although the most common tree species, had the lowest level of regeneration both inside and outside the fence.
- Shrub regeneration was also low in fenced sites.



### Step two: Managing your remnant - what else is needed?

Remnants on more fertile soils and with a history of fertiliser use and moderate to heavy grazing are more likely to have a higher cover of exotic species, fewer native species and no tree or shrub regeneration.

This means that additional management actions may be needed to reduce exotic ground cover and encourage regeneration in these sites. Potential actions that may assist in encouraging regeneration and controlling exotic species in vegetation remnants include:

- strategic grazing
- the use of fire
- weed control
- manipulation of soil carbon, and
- addition of seed or seedlings.



Further research is required to determine which of these actions can assist in controlling exotic species and which will result in the greatest improvements in native species diversity and regeneration.



### Regeneration in drought

Low shrub and tree regeneration in fenced areas may also be the result of low rainfall since fencing.

Across the two catchments, the sites included in this study have experienced either below, or very much below, average rainfall since 1996.

This suggests that climatic conditions may also contribute to the outcomes of fencing and that the benefits of fencing may change over time depending on seasonal conditions.

## Was fencing worthwhile? What the landholders thought

In addition to the vegetation assessment, landholders were surveyed to determine their attitudes to the fencing, their management practices within the fenced remnant and any changes they had noticed in the condition of their vegetation remnants.

Eighty-eight percent of landholders felt that the fencing had been worthwhile, and included reasons such as:

- Improved regeneration of native plants
- Easier stock management
- Greater soil erosion control
- Easier salinity management
- Increased wildlife, and
- Greater enjoyment from their patch of bush.

However, not all changes in the fenced remnants were positive, with some landholders reporting an increase in weeds and feral animals after fencing.



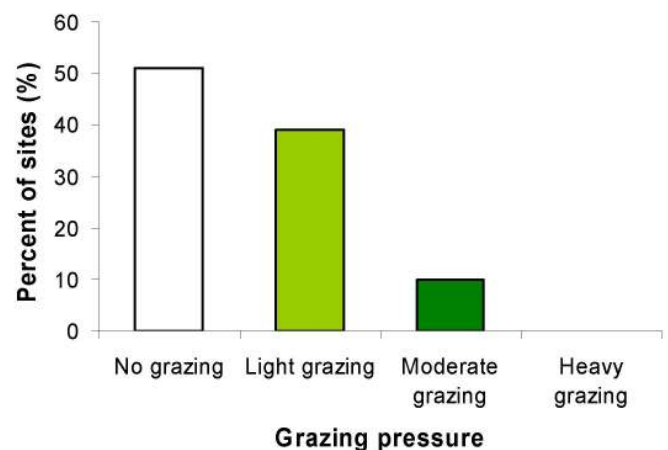
*"It's part of our whole management plan. Yes I can see a difference even with drought. With reduced stock pressure a lot of erosion settled quickly."* Sheep producer, Wagga Wagga.

*"(Fencing) has given us more management options with stock movement, we can use sheep for weed control and to protect the remnant."* Sheep producer, Coolamon.

## Grazing in fenced remnants

Fencing allowed landholders to better manage their stock and change the grazing regime in the remnants.

Despite prolonged drought, over half of the fenced remnants had not been grazed by stock since fencing. More than one-third had been only lightly grazed with occasional 'crash-grazing' or with very low numbers for longer periods (0 - 1.5 DSE/ha/day). Only 10% of sites had been moderately grazed with higher numbers of stock (1.5 - 2.5 DSE/ha/day) and no sites had been heavily grazed.



This suggests that fencing remnants can provide an important tool for stock management and that landholders clearly saw the value of controlling grazing in fenced remnants for improving environmental quality.

*"More controlled grazing now. Couldn't keep them (the stock) out of the area before, now I can dictate grazing pressures."* Sheep producer, Woodstock.

*"Crash grazed. Chewed the Paterson's Curse right down with good results with grass regeneration."* Cropping and sheep producer, Wagga Wagga.

## References and further reading

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## Organisations and websites

Grassy Box Woodlands Conservation Management Network

[http://www.gbwcmn.net.au/gbw\\_home.shtml](http://www.gbwcmn.net.au/gbw_home.shtml)



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