Managing Grassy Ecosystems for Conservation, Biodiversity and Production Outcomes

Jodie Reseigh and Paul Foster
Rural Solutions SA, Clare

RESEARCH

Key messages

- **Landholders on Eyre Peninsula are improving the management of former sheoak grassy woodlands for conservation, biodiversity and production outcomes.**
- **Trial sites have been monitored annually since 2001 for a variety of attributes including: presence of species; numbers of native perennial grass plants; contribution of dominant species to total dry weight of pasture.**
- **Trial results indicate changing trends in the percentage contribution to the pasture biomass, with increases in native grasses and decreases in annual grassy weeds.**
- **It is imperative long term monitoring be continued to determine the nature and most appropriate management strategies to improve native grassy ecosystems in this region.**

Why do the trial?

The project aims to investigate grazing management options for sheoak grassy woodlands in order to improve conservation, biodiversity value and to maintain or improve productivity of perennial native grass grazing systems on the Eyre Peninsula.

Set stocking or sub-optimally managed continuous grazing of livestock on pastures dominated by native grass species has resulted in pastures becoming degraded, predominately with the loss of more desirable plants including Wallaby grasses *(Austrodanthonia species)*, native legumes and native forbs and herbs.

Perennial grasses that persist under set stocking or continuous grazing regimes are often less desirable species as they are often prostrate, small in size and have reduced palatability. Annual grass species such as wild oats, barley grass and undesirable plants such as saffron thistles, geranium/ Stork's Bill have replaced these native perennial grasses. Generally there has been a decline in productivity and biodiversity of these pasture systems as a consequence.

Native grasslands are one of the most threatened native ecosystems in Australia. This project aims to demonstrate that conservation of these systems is possible without compromising productivity. Applying appropriate rotational grazing systems may improve productivity whilst simultaneously increasing biodiversity value, from these areas. This article follows previous articles by Bartel 'Native grassland grazing demonstration sites' published in Eyre Peninsula Farming Systems 2002 Summary, pp 50-51, and Reseigh, Bartel, and Ancell 'Managing sheoak grassy woodlands' published in Eyre Peninsula Farming Systems 2005, p 70-71.

How was it done?

Three properties are included in the grazing trial. Two properties are located in the Elliston area where monitoring began in 2001, and a third property at Louth Bay where monitoring commenced in 2004.

At each property, the trial area was subdivided into smaller paddocks to enable the implementation of a rotational grazing regime. Landholders aim to graze the paddocks at high stocking densities (greater than 150 DSE/ ha) for short periods of time (1-20 days), with appropriate rest periods (overall stocking rate is ~ 1 DSE/ha/annum). The rest period is important in allowing the perennial grass species to recover before being grazed again. Average stocking rates in the rotationally grazed areas are generally similar to, and in some cases higher than, the district average.

At each property a number of paddocks in the trial and a control paddock (a paddock set stocked or continuously grazed) are monitored annually for changes in pasture composition and productivity. This allows comparisons to be made between the trial and control paddocks and to monitor comparative changes over time. Within each paddock a 100 m long transect was established and the following pasture attributes measured.

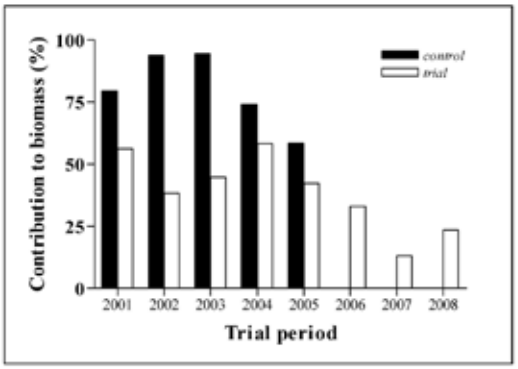

Figure 1 Annual grassy weed contributions to pasture biomass at the Tree property (Elliston) over the trial period 2001-2008.

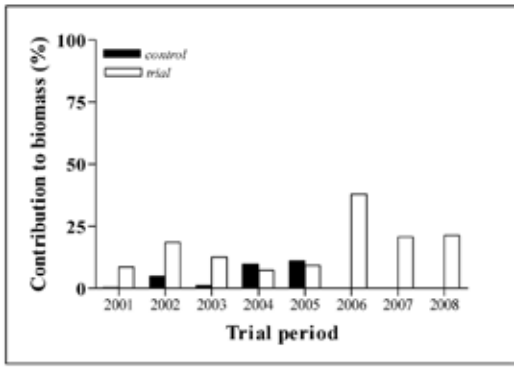

Figure 2 Native grass contributions to pasture biomass at the Tree property (Elliston) over the trial period 2001-2008.

Note control area 2006-2008 results unavailable due to use of control plot by landholder.

Presence/Absence

- At 4.5 m intervals along each transect the presence of all plant species is recorded in a 50 x 50 cm quadrat (15 quadrats). This attribute indicates species frequency and diversity within the paddock.

Number of native perennial grass plants per quadrat

- The number of native perennial grass plants present per quadrat along each transect is recorded. The numbers of native perennial grass plants per quadrat is an indication of the condition of the pasture as perennial grasses provide stability to pastures.

Available pasture mass

- Pasture cuts are taken on each property to determine a pasture height/weight relationship. This information forms a basis for a relationship between pasture height and dry weight. Landholders can then use this information to calculate the available pasture mass from a measure of plant height; this information can assist landholders in determining appropriate stocking rates.

Contribution of dominant species to total dry weight of pasture

- In each quadrat the dry weight rank of the dominant plant species is visually assessed. This will give a measure of species contribution to total pasture dry weight relative to other species in the pasture.

Photo points

- Photo points have been established at each site to monitor visual changes in composition of the pasture.

What happened and what does this mean?

The trial suggests to the present time, landholders on Eyre Peninsula are able to successfully manage former sheoak grassy woodlands for conservation, biodiversity and production outcomes using rotational grazing strategies.

Changes in the contributions to the pasture biomass have been observed in the trial paddocks at the Tree property over the period of the trial. Initially the trial and control area pastures were dominated by annual grasses such as wild oats *(Avena barbata)* and brome grass *(Bromus rubens)*. Over the duration of the trial to date, this contribution to the pasture biomass in trial paddocks has reduced from 56% to 24% (Figure 1). However, the change in the contribution of annual grasses to the pasture biomass in the control area has also declined slightly. Note control area 2006-2008 results are unavailable due to use of control plot by landholder.

Conversely, increases in the contribution of native grasses (Wallaby grass - *Austrodanthonia species* and Spear grass - *Austrostipa species)* have been observed in the trial paddocks with the percentage contribution to pasture biomass increasing from 9% to 21% over the eight years of the trial (Figure 2), with the contribution increasing particularly in the period 2006 - 2008. Note control area 2006-2008 results are unavailable due to use of control plot by landholder.

Any changes in native grassy ecosystems as a result of improved management are likely to be long term. The trends observed in the trial to this point require longer term monitoring to confirm the results and define the detail of the grazing management strategy. Therefore it is important for monitoring to be continued to confirm or dispute the initial trends and explore other changes as a result of grazing management for sheoak grassy woodlands on Eyre Peninsula.

Acknowledgements

This project would not have been possible without the assistance of landholders Arthur Robinson, Keith Tree, Simon Guerin and Dion Lebrun. This project acknowledges the assistance of Eyre Peninsula NRM staff. The project has been funded by the EP NRM Board and the Natural Heritage Trust. Di DeLaine and Brett Bartel (Rural Solutions SA) for their assistance with field work