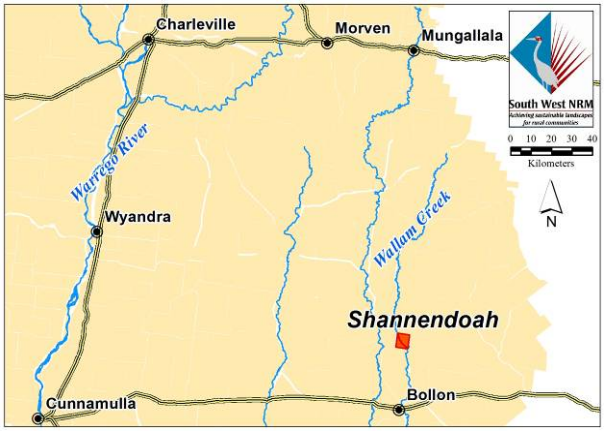
Case study: Establishing a rotational grazing system in box-mulga country, Wallam Creek

Brett and Jenny Sheahan of 'Shannendoah' on Wallam Creek, north of Bollon, have boosted their capacity to optimise ground cover and grazing business outcomes by subdividing paddocks into many smaller units, each served by off-stream watering points. Environmental benefits include reduced soil erosion and improved condition of the riparian zone.

Introducing Shannendoah

Shannendoah is a grazing property of 4008ha situated north of Bollon in south-western Queensland. Wallam Creek, a seasonal watercourse in the Nebine catchment of the Queensland Murray-Darling Basin, traverses Shannendoah from the north-west to south-east corners. The country is relatively flat, within an extensive semi-arid plain.



Before development for agriculture, Shannendoah comprised approximately 3480ha of poplar box and mulga plain, 500ha of wooded alluvial plain and small areas of other mixed woodland on sand rises. Roughly half of Shannendoah has been cleared. Buffel grass has colonised paddocks extensively and become well established in some areas. The soft red soil is generally stable and relatively productive if ground cover vegetation is maintained.

Supported by several years of above average rainfall, ground cover at Shannendoah presently is better than in the preceding decade. Wire grass *Aristida* spp. is the dominant native grass and other native grasses and forbs are also present.

In the mulga communities, high density regrowth can limit the carrying capacity for livestock.

Mulga woodland with wire grass dominant in the ground cover; typical landscape of Shannendoah.

The grazing enterprise

Shannendoah has been owned by Brett and Jenny Sheahan for 7 years; they started living on the property 5 years ago. Brett previously managed other properties in the Bollon district. To support their young family, Jenny has been working part-time off the farm.

The business enterprise at Shannendoah is beef cattle breeding. Current carrying capacity for Shannendoah is estimated at 260 Livestock Units. A number of fast growing Dorper sheep, intended for meat production, have been included in the livestock herds. Brett sees this as experimental:

> 'It remains to be seen if this is sustainable, given the greater impact that Dorpers have on pasture than cattle.'

To start the present grazing operation, the single paddock was divided into 4 paddocks, 2 on the east and 2 on the west side, each approximately 1000ha in area. The cross-fencing for those paddocks was barb wire at the top and 5 plain wires of which 3 were electrified.

An artesian watering system had been installed to cater for potential development as a cell grazing system. Brett piped flowing artesian bore water to storage

tanks, then delivered it to stock in cement troughs that had been strategically located in the paddocks.

Cattle at a recently installed watering trough that is shared between 2 new paddocks.

Wetlands and biodiversity

In terms of wetlands, Wallam Creek is the dominant feature at Shannendoah. It has a relatively narrow single or split channel (5-10m wide) and minor associated floodways. Although usually flowing intermittently and only in the wet season, there are 2 semi-permanent waterholes within Shannendoah. But Wallam Creek can also transmit major floods and in the summer of 2012 it inundated houses downstream in Bollon township.

River red gums occupy the lower banks of the Creek and poplar box and shrubs occur higher in the riparian zone.

Wallam Creek runs diagonally across Shannendoah and is the most prominent wetland.

Robust *Cyperus* tussocks line the edge of the main channel and the inner slopes and ridges support umbrella canegrass *Leptochloa digitata*, Warrego summer grass *Paspalidium jubiflorum* and other native tussock grasses.

Within the narrow floodplain, some small off-channel oxbow/billabong features occur; but these only hold water in the wet season.

Temporarily inundated swamps are a notable feature of the plains around Bollon and farther west. Typically, these depressions have hard claypan floors or gilgai (melon-hole) surfaces and many of the depressions are timbered with poplar box. On Shannendoah, some have been cleared and now support *Leptochloa fusca* tussock grass and *Cyperus* and *Eleocharis* sedges. Brett reports that small numbers of ducks may use these swamps during the few weeks or months in which they hold surface water.

No systematic surveys of plants or animals have occurred property wide as yet. About 50 species of birds were recorded in a brief survey in May 2012 but much greater diversity is likely to occur.

Tree diversity in the Mulga Lands

The term 'Mulga Lands' is applied to an entire biogeographic region extending from Jundah to St George in Queensland and deep into western NSW. Indeed, mulga *Acacia aneura* is widespread in and characteristic of the region, but it does occur outside this region and is not the only common tree within the region. In Queensland, the largest mulga dominated areas tend to be in the Mulga Lands. But mulga often occurs with taller/emergent poplar box *Eucalyptus populnea* and may also be associated with several other tree and shrub species including acacias and *Callitris* native pine. This diversity is well illustrated at Shannendoah where mulga is a component of most of the remnant woodland, but taller poplar box, and other mulga associates, are also conspicuous. Vegetation communities on old loamy and sandy plains (land zone 5) of the Mulga Lands are described in detail on the Department of Environment and Heritage Protection's website.

Strategies for natural resource management

Brett and Jenny Sheahan wish to optimise control of stock movements and grazing pressure in order to maintain a sustainable and profitable grazing enterprise on Shannendoah. When asked about their motivation, Brett replied:

> 'With the right management strategy we hope to make sheep sustainable while improving the health of the land.'

Their strategy hinges on being able to rotate stock through small paddocks that are each served with watering points, over relatively short periods of time. As well as realising benefits for production, they see the importance of optimising land condition and hope to achieve that through maximising ground cover and reducing erosion, especially around the margins of Wallam Creek.

Riparian fencing project

Keeping livestock out of the riparian zone was an early key action in Brett's strategy for Shannendoah. With some external funding assistance, 18.5km of fencing was erected to complete an exclusion fence on both sides of Wallam Creek. To replace the natural watering areas for the stock, 12 troughs and tanks, supplied by bore water, were set up as off-river watering points.

As well as changing the way in which livestock access and use water, riparian fencing improves ground cover in a degraded riparian zone. At Shannendoah, the recent good growth of native tussock grasses aided by several recent wet years can be expected to extend to a long-term recovery, while stock are excluded.

Part of the fence that separates the riparian zone of Wallam Creek from other paddocks.

Rotational grazing project

The aim of Brett's main project for natural resource management at Shannendoah is to trial a cost effective, time managed, rotational grazing system. The system should maximise plant and animal production and optimise grazing enterprise profit, while improving ecosystem sustainability.

This project has received funding support from South West NRM and the fencing is now complete and the first stock rotations have commenced.

The principle for rotation is that plants require a recovery period during the growing season (spring-summer); the period is determined by the rate of growth. That is, the transfer of stock to another paddock would be based on the growth rate of the particular pasture in that paddock.

The stocking rate needs to be adjusted to suit carrying capacity for each paddock, with maximum stock density used for minimum time. No more than 40% of available pasture should be grazed with each move.

Landholder Brett Sheahan explains the pending arrangement of new fences and trough.

To implement a rotational, time controlled grazing system at Shannendoah, Brett chose to reduce the paddock sizes, depending on land type and estimated stock days per hectare:

> 'We were lucky that we could start our fencing from scratch. Coming on to Shannendoah with minimal fencing in place gave us a free hand to set up new fences where we wanted.'

There are now 22 paddocks, each 120-180ha in area, with shape and size of paddocks determined by location of watering points and walk-in distances for livestock. Having sufficient watering points is extremely important for this stocking system regime.

Fencing for the cell grazing was constructed using 3 plain wires, 2 of them electrified. In keeping with the sustainability principle, electricity for the fences is supplied by the solar panel system at the homestead, with a back-up generator.

Brett says:

> 'The solar system works well here—there are only short periods when we need to run the generator.'

Fencing at water points has been designed to cater for animal health, behaviour and security.

An older section of fence beside the riparian zone; securing control of stock access to Wallam Creek has been a key strategy implemented at Shannendoah.

Adequate planning has been critical to the success of this trial. South West NRM provided some technical support, with consultation on site to investigate the best options for subdivisional fencing and water infrastructure, as well as advice on performance of the trial. Grazing charts, along with property mapping and the property planning, have been essential tools.

A suitable monitoring and evaluation regime was especially important for this project and South West NRM again assisted. Baseline data were collected before the start of the project.

The grazing chart is the primary monitoring tool. To ensure records are shared, it is Brett's responsibility to use grazing charts and provide rainfall and production monitoring data to South West NRM. The 4 critical pieces of management information to be charted are:

- rest periods for each paddock (days)
- yield of each paddock (stock days per hectare)
- stocking rate (stock days per hectare)
- stocking rate relative to carrying capacity (stock days per hectare per 100 millimetre rainfall).

Every 6 months, South West NRM will collect, interpret and report on monitoring data from pasture monitoring transects (targeting pasture species and ground cover, by land type) and photo monitoring sites that represent the major land and soil types. Key data will include indicator species, plant diversity, ground cover and plant basal area. Economic performance will be documented to calculate return on investment.

Benefits for production and biodiversity

The major broad outcome of the rotational grazing project is expected to be linking profitability of the grazing enterprise to environmental sustainability. Though not yet 100% established and with time needed to fully prove success, nevertheless it is hoped that the project will be a model taken up widely, thereby achieving landscape scale conservation across South West Queensland.

To raise interest and spread the message about rotational grazing, a field day was conducted at Shannendoah in May 2012. Monitoring results over the coming years will be widely communicated through South West NRM and local networks.

In terms of economic benefits, grazing of pastures at their peak nutritional levels should translate to good feed conversation rates and good market prices at sale of livestock.

In terms of benefits for biodiversity, greater levels of ground cover and reduced erosion should restore the native plant and animal species that tend to disappear from overgrazed country.

Erosion gullies on the edge of the main channel of Wallam Creek have been targeted for repair.

Future plans and conclusions

Brett and Jenny plan to extend their drive to improve Shannendoah by repairing priority erosion gullies along the edges of Wallam Creek. Previous decades of stock access to the creek banks has contributed to the riparian zone becoming vulnerable to gully erosion, particularly at the point where the gentle slope of the plain suddenly steepens into the watercourse.

Although much of the benefit of the work at Shannendoah is not yet fully visible, initial indicators of success and the sound philosophy behind the projects should encourage other graziers to adopt similar strategies.

Landholders Jenny and Brett Sheahan at a field day on Shannendoah organised by South West NRM.

Acknowledgments

The generous cooperation and support of Brett and Jenny Sheahan is gratefully acknowledged. Neil Judd, Julie Frousheger, Amy Steer, Tom Judge and other staff of South West NRM assisted with planning materials, advice and site visits. The development of the case study was funded by the Queensland Government through the Queensland Wetlands Program. All images were taken by Roger Jaensch.

South West NRM Ltd
Achieving sustainable landscapes for rural communities

The Queensland Wetlands Program supports projects and activities that result in long-term benefits to the sustainable management, wise use and protection of wetlands in Queensland. The tools developed by the Program help wetlands landholders, managers and decision makers in government and industry. The Program is a joint initiative of the Australian and Queensland governments.

Contact wetlands@ehp.qld.gov.au
or visit www.wetlandinfo.ehp.qld.gov.au

QWP/2012/05 (updated 2013)