

Stock management on watercourses

This introductory guide has been prepared to help individual landholders and the community manage stock access to watercourses. Overgrazing of riparian lands is a primary cause of vegetation removal and is a major issue for watercourse and land management. This guide describes the main principles and practices of stock management, including fencing and water access.

Riparian land and stock management

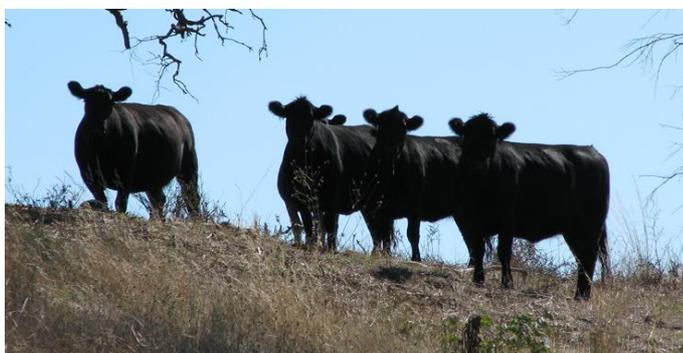
The Northern & Yorke Region contains four priority catchments: Willochra, Broughton, Wakefield and Light. These catchments cover an area of 1,460,000 hectares and contain native riparian vegetation corridors within a largely cleared agricultural landscape. Grazing has been identified as the most extensive threatening process in recent biodiversity value assessments of the riparian zone in Australia (Sattler & Creighton 2002).

Since European settlement, river landscapes and wetlands have been used by Australian farmers as watering points for stock as well as valuable sources of feed. Today, the impact of domestic and feral grazing on riparian habitats is often greater than within dryland habitats. Livestock in particular have negative impacts on watercourse geomorphology and hydrology; riparian soils; in-stream water quality; and aquatic and riparian vegetation.

Why should we manage stock around watercourses?

Water quality

Livestock overgrazing within riparian areas causes major problems with erosion and river siltation resulting in poor water quality. Uncontrolled grazing near the water's edge leads to increased nutrient concentrations from stock excrement; high bacterial and protozoan loads; and high turbidity in water. Land clearing and overgrazing over the years can lead to a lack of shade over the stream which can



result in increased temperature, increased algal and aquatic weed growth and low water quality.

Watercourses contaminated with livestock waste can negatively affect:

- human health – faecal material in watercourses can lead to human diseases such as giardiasis, salmonellosis, gastroenteritis, typhoid fever, hepatitis A, amoebiasis and viral gastroenteritis (Splichen1992)
- in-stream fauna – livestock can impact on aquatic invertebrates and fish and poor water quality can have major effects on fauna. These effects can be particularly severe during periods of low flow, such as during the dry season or when animals congregate at the few remaining waterholes in the landscape.
- stock production – several studies from Western Australia have shown that stock productivity can be increased by up to 25%, just by providing clean and uncontaminated water. Wethers that drank from polluted dam water lost 1.7 kilograms more body weight and consumed 33% less water than those that drank solely from fresh water (Parlevliet 1983).

Riparian vegetation

Riparian land is often a very diverse part of the landscape and usually contains various tree and shrub species as well as ground cover plants such as grasses, sedges and herbs. The presence of different plant species in the landscape influences the nature of the root zone and the depth to which roots penetrate. This affects the water table in watercourse banks and bank stability.

The major pressure on riparian lands is the direct grazing and trampling of ground covers, shrubs and saplings. Plant parts are removed from ground cover vegetation during grazing and damaged by trampling. This results in a loss of ground cover and vegetation biomass; loss of grazing-sensitive species; and a decline in native plant species.

The loss of significant species within riparian vegetation affects plant diversity and can result in changes in microclimate, nutrient cycling and soil structure. This disruption and degeneration of ecosystem function in riparian zones cannot be easily reversed.



Livestock impact riparian vegetation by:

- degrading riparian habitat through the loss of riparian-dependent fauna, including aquatic organisms
- reducing the number of native plant species
- compacting soil
- promoting weed invasion.

Heavy livestock grazing can promote weed invasion and change the vegetation structure (Fleischner 1994). Areas that are constantly grazed and trampled by livestock are usually open sites and provide the perfect opportunity for weeds to establish. Weeds are also spread by stock movement, either through seeds attached to the animal or in their faeces. Stock faeces and urine also contribute large quantities of nutrient to the soil that further encourage weed spread and growth.

Managing stock access and grazing pressure

Rapid results can be seen when livestock are managed and sustainable grazing practices are implemented. This is particularly true for the recovery of physical functions, like restoring native vegetation, preventing erosion and improving water quality. The most effective way to manage uncontrolled livestock in riparian land is to prevent or control stock access with fencing. Vegetation can respond to livestock exclusion in a number of different ways and this depends on:

- prior adaptation of vegetation to livestock grazing
- availability of seed sources
- extent of vegetation degradation
- other factors, such as floods and weeds.

At sites with a long history of grazing, riparian vegetation may have adapted to this form of disturbance. In these cases livestock exclusion can lead to changes in the vegetation and invasion by woody plants and reduced species diversity (Milchunas & Lauenroth 1993). Sustainable grazing that does not affect vegetation cover should be the long term aim of riparian land management. Pulse grazing of riparian areas can help to sustainably manage weeds, groundcover and existing vegetation.

There are two main methods to control stock access and grazing pressure within riparian lands: fencing and designated watering points.

1. Fencing

Fencing is the most practical way of regulating animal access and grazing pressure on riparian land. Fencing can be used by landholders to manage stock access according to need and available feed. The fencing type and location will depend on type of stock; when and how landholders

want to use riparian area; the size and shape of the channel; flood frequency; and the size of flood peak.

Fences should not be located too close to the watercourse due to possible flood damage, widening or incising of the channel. It is generally suggested to place the fence at least 10–20 metres from the top of the bank.

There are several types of fences available.

Hanging fences

Hanging fences are built across narrow watercourses so that stock cannot walk along the watercourse to bypass the fence line. Hanging fences are usually made from steel cable or multi-stranded high-tensile fencing wire, strung across the channel. These may be damaged by debris during big floods, but can be cheaply and easily repaired or replaced.

Electric fences

Electric fences have also been designed for use along and across watercourses. They are more cost effective due to their cheaper construction and repair cost. Electric fences are usually efficient for areas that often flood as they are designed to survive a flood unless hit by large debris. Portable electric fences are also available and these allow landholders to control stock movement along the waterways and during flood peak.

Drop fences

Drop fences are designed to be manually operated under the pressure of floodwater and debris. These fences are portable and simple to pull back up and reattach to their anchor points. They are also useful during stock or heavy vehicle movement from one paddock to another.

Electronic fences

Electronic fences are generally used to control cattle, which wear a receiver developed in the form of an ear-tag. Transmitter boxes are positioned to form a boundary between the riparian area and rest of the paddock and these produce a continuous signal that defines the protected area. The ear-tag receivers are designed to produce an audio signal initially and then apply an electric stimulus to the animal's ear when cattle enter the protected area. This type of fencing is new to the Australian market and is under active development.

2. Watering points

Creating an alternate watering point for livestock is another option to protect riparian areas. Carefully located, shaded watering points and supplementary feeding stations can be used as an alternative to fencing. These alternatives can significantly reduce the amount of time stock spend in riparian areas without the need for fences.



There are three main watering systems that could provide clean water to livestock.

Formed access point

Carefully selected formed water points can be a relatively cheap option for significantly reducing stock impact in riparian areas. It is important to select a graded slope into the watercourse as the site for a formed access point. Consider using concrete, compacted gravel and rock, logs or similar material to protect the surface and form the walkway for livestock. Cross-channel fencing may be required to prevent animals wandering along the banks.

Alternative water supply

Providing water from a dam upslope or a reticulated water scheme is often the most effective water supply option. This encourages stock to maximise the use of available feed in the area.

Pumping watercourse or groundwater

Riparian lands overlie old river channels with beds of sand and gravel. These formed aquifers may provide good quality water for a large number of animals. This water can be accessed by range of different pumps or windmills.

A range of pumps have been developed that can extract a small volume of watercourse water to tanks and troughs for stock. For remote areas, solar pumps are ideally suited to the climate and are becoming a more cost-effective option.

Nose pumps are another new pump type that is attractive because of its low cost in the Australian market. These pumps are operated by cattle which push against a lever as they drink from the pump bowl – this operates a piston and diaphragm and pumps more water from the watercourse.

References and further reading

Bell, I. and Priestley, T. 1996. *Management of Stock Access to the Riparian Zone – Overview of relevant literature*, A joint Land and Water Resources Research and Development Corporation and Department of Primary Industries project funded under the Rehabilitation Program Component C- Demonstrations, Australia

Black, J. 1998. *Fencing the Avon River*, Avon River Management Authority, Western Australia. LWRRDC 1996, *Riparian Management Guideline 6 –Managing Stock*, Land and Water Resources Research and Development Corporation, Canberra.

Fleischner, T.L. 1994. Lifestock grazing and wildlife conservation in American west: Historical, policy, and conservation biology perspective, Environmental studies programme, Prescott College, AZ, USA

For more information

on stock management in riparian lands contact:
Natural Resources Centre – Clare (head office)

155 Main North Road,
Clare SA 5453

Ph: (08) 8841 3400

www.naturalresources.sa.gov.au/northernandvorke

Gale, G. and Heinjus, D. 1994. *How to prepare a fencing plan: Wires and Pliers – the farm fencing manual*, Kondinin Group, Western Australia.

Kingsford, R.T. 2000. 'Ecological impacts of dams, water diversions and river management on floodplain wetlands in Australia', *Austral Ecology*, No. 25, pp. 109–127.

Lovett, S and Price, P. (eds) 2007. *Principles for riparian lands management*, Land & Water Australia, Canberra.

Milchunas, D.J. Lauenroth 1993. Endogenous and Exogenous Disturbances in the Shortgrass Steppe: Implications for Current Management and Future Climate Change.

Parlevliet, G.J. 1983. *Water Quality for Stock — quantity, pollution, algae, salt*, Western Australian Department of Agriculture, Bridgetown

Pusey, B.J. and Arthington, A.H. 2003. 'Importance of the riparian zone to the conservation and management of freshwater fish: a review', *Marine and Freshwater Research*, No. 54, pp.1–16.

Sattler P., Creighton C. 2002. 'Australian Terrestrial Biodiversity Assessment 2002.' National Land and Water Resource Audit. Canberra, ACT. p 143

Splichen, E. 1992. 'Bacteria in farm dugout water', *Prairie Water News*, vol. 2, no. 1, p. 6.

Staton, J. and O'Sullivan, J., 2006. *Stock and waterways: a manager's guide*. Land and Water Australia, Canberra.

Water and Rivers Commission 1999. *Revegetation: Revegetating riparian zones in south-west Western Australia*, Water and Rivers Commission River Restoration Report No. RR4, Perth, Western Australia.

Water and Rivers Commission Water Note 12, "Fence location and grazing control".

Water and Rivers Commission Water Note WN10, "Protecting riparian vegetation".

Water and Rivers Commission Water Note WN11, "Identifying the riparian zone".

Water and Rivers Commission Water Note WN12, "The values of the riparian zone".

Water and Rivers Commission Water Note WN19, "Flood proof fencing for waterways".

