

## Riparian Management and Restoration

The term ‘riparian land’ refers to any land which adjoins, or directly influences, a body of water. This includes land immediately alongside rivers and small creeks, including the stream bank itself, gullies which sometimes run with surface water, the margins of lakes or dams, wetlands and river floodplains. This Note discusses the importance of riparian land and the role landholders can play in the rehabilitation and maintenance of these areas.

‘Riparian vegetation’ is the term used to describe the unique plant

communities associated with riparian land. These communities usually have a different plant species mix and structure to the vegetation of the surrounding countryside. Typically, riparian vegetation is more diverse, more dense and sometimes taller than adjacent communities due to the higher moisture levels and more fertile alluvial soils. Viewed from the air, riparian land usually stands out as a network of dark green ‘arteries’ in the landscape.

Riparian vegetation is typically associated with alluvial soils (e.g.

floodplains, alluvial plains, terraces, levees, channels, river and creek flats, swamps and inland lakes). Under the Regional Ecosystem (RE) classification system for vegetation communities (refer to *Land for Wildlife Note V1 - Regional Ecosystems*), these land types are typically Land Zone 3. A number of riparian REs are listed as ‘endangered’ or ‘of-concern’ because so much has already been cleared for farming, grazing or residential purposes, and what little remains, is often threatened by further clearing or weed invasion.

### The values of riparian vegetation


Riparian vegetation offers a wide range of ecological functions such as providing habitat, buffering run-off, stabilising streambanks and regulating stream temperatures and light.

#### 1. Biodiversity and wildlife habitat

Riparian vegetation provides a network of corridors across the landscape which animals can use for daily movement or seasonal migrations (refer to *Land for Wildlife Note G2 - Wildlife Corridors*).

From a biological point of view, riparian land is the most fertile and productive part of a landscape. The interaction between land and water in the riparian zone helps create a range of habitats that support a diversity of flora, fauna and fungal species. The diversity of riparian plants provides food, shelter and other resources for many animals including birds, reptiles, mammals and invertebrates. These animals may be permanent residents or occasional visitors taking advantage of seasonal food sources (e.g. fruiting trees). Alternatively, they could be seeking refuge from fire or drought.

The role that riparian vegetation plays in supporting aquatic habitat is equally important. Woody debris such as branches, large limbs and even whole trees (known as ‘snags’) are an important natural component of aquatic ecosystems. Many fish species use snags for refuge and as a site to lay their eggs. Riparian vegetation also provides food for aquatic animals. All of these in-stream resources are provided by the riparian zone. Therefore it is critical to use only local native plant species in riparian restoration work.



Riparian vegetation along waterways can easily be seen from the air. These corridors of green help maintain linkages in the landscape.

## 2. Buffering sediment and nutrient run-off

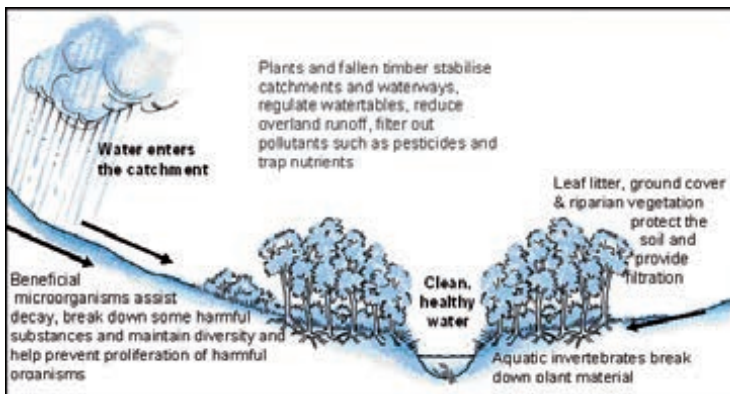
Riparian vegetation is the last line of defence against potential water pollutants and acts as a natural barrier filtering, trapping and absorbing nutrients, sediment and waste before they flow into streams. Vegetation within a riparian buffer zone helps to slow the overland movement of water during rain events, resulting in sediment and nutrients being deposited on land before reaching the stream.

## 3. Stream bank stabilisation

Vegetation on stream banks helps support soil so the bank does not erode and collapse. A combination of deep rooted trees on the upper banks and the fine root systems of reeds and sedges lining the water channel is generally the most important safeguard against stream bank collapse. Many of our native plants are specially adapted to riparian areas. Introduced plants like Camphor Laurel and willows do not have suitable root systems to withstand floods and therefore may contribute to stream bank erosion.

## 4. Temperature and light control

Well vegetated riparian areas help to keep waterways healthy with good water quality, low levels of sedimentation, cool water temperatures and well-shaded water. Cooler water contains higher levels of dissolved oxygen which is essential for fish and aquatic invertebrates. Disturbed riparian areas tend to have lower water quality due to increased light, water temperatures and nutrient run-off. This can lead to excessive growth of algae or water weeds, which thrive on sunlight and nutrients.



*The role of riparian vegetation in providing clean water.*



*Fallen dead wood and debris act to slow water flow and provide fish breeding habitat.*

## Rehabilitation of riparian land

Unfortunately, riparian areas are often degraded as a result of vegetation clearing, weed invasion and grazing by domestic livestock. The aim of any riparian rehabilitation program should be to produce a stable stream with well-vegetated banks. It is important to resolve any problems relating to stream stability before revegetating stream banks to increase the success of a rehabilitation project.

Restoration of riparian vegetation needs careful planning and it is recommended that you obtain advice from your local Land for Wildlife Officer before undertaking any major restoration project. The following guidelines will provide a starting point. In some situations, a permit to undertake works such as earthworks or installing a crossing may be required from the Department of Environment and Resource Management.

### 1. Assess the condition of the stream

Assessing the condition of a stream will identify problems and determine priorities for rehabilitation. This will involve documenting the type of vegetation along the stream, the condition of the stream bank and the impact of adjacent land uses. The highest priority for managing riparian vegetation should be to protect areas in good condition and, in situations where degradation has occurred, seek to rehabilitate and restore those areas.



## 2. Set goals and identify resources needed

As with any restoration project, setting goals, identifying resources and developing a timeline will help achieve intended outcomes. Short-term goals may include weed control, providing in-stream habitat and planting along streambanks.

## 3. Select appropriate strategies and techniques

There are a number of revegetation methods that can be used, depending on site conditions. Options include natural regeneration (refer to *Land or Wildlife Note V2 - Natural Regeneration*) and planting (refer to *Land For Wildlife Notes V3 - Revegetation Principles and V4 - Revegetation Practicalities*).

If planting, it is important to select local native species to maintain the genetic integrity and biodiversity of the rehabilitated area. Birds and other animals regularly use riparian corridors and will transport seeds and plant material to other waterways. So using native plants in riparian restoration works will help waterways on a landscape scale.

When choosing species for planting, consider their tolerance to frost and where they will be situated in the stream profile (i.e. will they be exposed to regular or occasional flooding?). Some plants like lomandras have a strong, matted root system and are resistant to flood waters, making them ideal for lining the main channel. Larger, deep rooted trees are suitable for the upper banks where they will not unduly impede the flow but will help stabilise the banks. Trees growing in the lower banks will create turbulence in floods resulting in undercutting of banks and erosion so avoid planting trees and shrubs here. For advice on selecting the most appropriate species for riparian revegetation and how to go about planting, contact your Land for Wildlife Officer.

## 4. Implement rehabilitation works and activities

The control of riparian weeds is often the key element of any stream rehabilitation program. Long-term management of weeds, in both the riparian and aquatic zones, is best achieved by maintaining an intact canopy (to shade out weeds) and by limiting disturbance (refer to *Land for Wildlife Notes EW1 - Weed Management Plan and EW2 - Weed Control Methods*).

Fencing the rehabilitation site and managing stock access will help minimise the impact on riparian zone vegetation. Installing off-stream watering points for stock will reduce the need for stock to access the riparian area, protecting the stream banks.



*Fencing protects this riparian planting from livestock, consequently improving the water quality, and adds a buffer to the existing riparian vegetation.*

## 5. Set up a monitoring program

Monitor the site regularly to reduce the risk of problems developing and to record your achievements. Keep good planting records including photographs, plant survival rates, techniques used and the effectiveness of these techniques in meeting the goals you outlined in commencing the project. Regular monitoring of riparian vegetation should aim to measure changes in species and structural composition (i.e. numbers and types of plants in both canopy and understorey), extent of new seedling establishment, regeneration of native species and changes in the composition and extent of weed species. It's also worthwhile keeping a record of wildlife sightings so you can see the changes occurring as riparian vegetation establishes and continues to grow. This is also an opportunity to review how you did things and whether there might be a better alternative/technique.

## 6. Maintain works or undertake follow up activities

To ensure long term success of any riparian project, follow up maintenance is required, such as:

- Watering plants in the early stages to aid establishment.
- Replacement planting after flooding or drought.
- Ongoing weed management.
- Managing fuel loads to reduce the risk of fire in and around the riparian area and constructing fire breaks where necessary.
- Monitoring the site for feral pests or livestock.

## What you can do

- ✓ Assess the condition of your riparian vegetation.
- ✓ Develop a management plan that sets achievable goals and selects appropriate strategies.
- ✓ Maintain riparian vegetation in good condition to trap sediment and nutrients.
- ✓ Replant or rehabilitate degraded areas.
- ✓ Implement a weed and pest animal control program.
- ✓ Restrict or prevent livestock access to riparian areas.
- ✓ Install off-stream watering points.
- ✓ Set up a monitoring program.
- ✓ Record wildlife occurring in the riparian zone.

## References and further reading

Telfer D (1998) *How Healthy is Your Watercourse? Assessing Stream Bank Vegetation*. DERM River Facts, Water and Catchment Management Unit.

Telfer D and Connell M (1998) *Stream Bank Planting Guidelines and Hints*. DERM River Facts, Water and Catchment Management Unit.



*Riparian vegetation in good condition on a Land for Wildlife property in the Gold Coast hinterland. The overhanging branches provide shade, reducing in-stream temperatures. Sedges and other groundcovers stabilise the streambanks and provide habitat for aquatic and terrestrial animals such as small fish, frogs and dragonflies.*



*Some aquatic invertebrates such as mayfly nymphs help break down plant material that falls into streams, whereas other animals, such as this damselfly nymph (shown above) eats mosquito larvae and other small insects.*

Land for Wildlife is a voluntary program that encourages and assists landholders to provide habitat for wildlife on their properties. For more information about Land for Wildlife South East Queensland, or to download *Land for Wildlife Notes* free of charge, visit [www.lfwseq.org.au](http://www.lfwseq.org.au)

Citation: Land for Wildlife Queensland (2011) *Note W1: Riparian Management and Restoration*.

Information in *Land for Wildlife Notes* is not necessarily endorsed by any of the supporting agencies, nor should it be taken to constitute professional advice or a recommendation of land management.

*Land for Wildlife Notes* are produced by SEQ Catchments, through funding from the Australian Government's National Landcare Programme, and the following 11 Local Governments of South East Queensland. Reprinted 2016.

