

6

Riparian bush



About this kit

This kit discusses riparian bush and gives specific guidelines for managing it. However, as with all the recommendations in the **Tasmanian Bushcare Toolkit**, the guidelines are not meant to be followed rigidly. Rather, they are intended to give you some principles for managing remnant bush. You can then modify the guidelines to suit your particular situation and needs.

The specific management of riparian vegetation depends on the bush type present. Therefore, this kit should be read in conjunction with the kit that discusses the particular bush type that makes up your riparian vegetation. For example, if the bush along the river is lowland grassland you should read this kit and **Kit 7 Grassy Bush**. You will then need to combine the guidelines given in Kit 7 with those in this kit.

If you are unsure what bush type makes up your riparian bush read the “Tasmanian Bush Types” section of **Kit 1 Bush on Your Farm** and use the key provided to identify the bush type and the relevant kit to use.

This kit includes:

- A description of riparian bush and where it tends to be found.
- Places where you can see good examples of riparian bush.
- The significance of riparian bush and some of the threatened species that may be found in it.
- The management issues relevant to riparian bush. The management guidelines included are those that are specific to riparian bush. As said before, these recommendations need to be considered in conjunction with those given for the specific bush type that makes up your riparian bush. Where no specific guidelines are given in either kit use the general principles outlined in **Kit 2 Managing Your Bush**.



Looking after riparian bush

Riparian bush is vegetation found along streams, creeks, rivers and wetlands. A variety of bush types make up riparian vegetation, including rainforest, wet forest, dry forest and scrub. Riparian bush may have a grassy, heathy, sedgey or shrubby understorey. Some riparian vegetation may be treeless and many rivers in Tasmania have extensive river flats of silver tussock grass as riparian vegetation. Alongside the stream there is often a strip of vegetation containing moisture-loving herbs, sedges, rushes and reeds that are periodically inundated. Within the stream are aquatic plants that are often referred to as macrophytes, which may float on the surface or emerge through it.

Much of the remnant riparian vegetation found in Tasmania is confined to the less productive parts of the rivers. The banks of many of the rivers flowing through the fertile floodplains of lowland Tasmania have been cleared and replaced with pasture or willow. This has been detrimental to the health and ecology of the state's river systems.

Good examples

The upper parts of river catchments often contain native riparian vegetation in good condition. These areas usually have all the attributes that make streams such interesting environments: diverse flora and fauna, healthy aquatic environments and many different habitats. Native riparian vegetation can also be found in natural refuges, such as narrow valleys or gorges. The Prosser River, on the east coast, is a good example of a river that still has reasonable native riparian vegetation, almost to its mouth at Orford.

Values

Riparian land is important from both the economic and environmental perspectives. It provides habitat, food and shelter for animals and is vital for maintaining good water quality. Riparian vegetation plays an important role in:

- **Stabilisation of river banks.** Riparian vegetation can protect banks from scour and collapse. Generally, a bank covered with vegetation will erode at a lower rate than a bare bank.
- **Maintenance of water quality.** Vegetation is an important filter that helps to reduce the speed of water runoff from surrounding areas, thereby allowing sediments and nutrients to be trapped.
- **Provision of habitat for aquatic species.** Riparian vegetation is an important source of food for both fish and aquatic insects. The mottled shade of riparian vegetation creates cover for both predator and prey, habitat for threatened plants, and habitat and feeding areas for fish.
- **Maintenance of habitat conditions.** The shade provided by riparian vegetation helps to regulate water temperature and light levels, thereby maintaining suitable water quality for aquatic plants and animals. Reducing the temperature leads to higher oxygen levels for aquatic fauna. Limiting the available light reduces weed and algal growth.

THREATENED ANIMALS OF RIVERS INCLUDE:

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- Swan galaxias (*Galaxias fontanus*)
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- Clarence galaxias (*Galaxias johnstoni*)
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- Saddled galaxias (*Galaxias tanycephalus*)
-
- Dwarf galaxias (*Galaxias pusilla*)
-
- Australian grayling (*Prototroctes maraena*)
-
- Giant freshwater crayfish (*Astacopsis gouldii*)
-
- Mt Arthur burrowing crayfish (*Engaeus orramakunna*)
-
- Burnie burrowing crayfish (*Engaeus yabbimunna*)
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THREATENED PLANTS OF RIVERS INCLUDE:

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- River dogwood (*Pomaderris phyllicifolia*)
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- Small-leaf sphyridium (*Spyridium microphylla*)
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- Midlands mimosa (*Acacia axillaris*)
-
- Oyster Bay pine (*Callitris oblonga*)
-
- Native wintercress (*Barbarea australis*)
-
- Clubmoss bush pea (*Pultenaea selaginoides*)
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- Water milfoil (*Myriophyllum integrifolium*)
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Refer to **Kit 5 Threatened Plant Species in Your Bush** for more information and an illustration of each species.



Management issues

Riparian land is often highly productive making it vulnerable to overuse. Poorly managed access to streambanks by stock can lead to erosion, soil compaction and weed invasion as well as a loss of native vegetation. Healthy streambank vegetation and instream habitat, such as woody debris, increases habitat for fauna and improves water quality by reducing runoff. The management of riparian land becomes problematic where there are infestations of weeds such as willows or where the area is devoid of vegetation. The areas of a catchment with remnant native vegetation are a high priority for the protection of biodiversity.

Grazing

Stock are one of the most serious management problems along rivers. The problems they cause include:

- Loss of vegetation through trampling and grazing, leaving bare banks that are more vulnerable to erosion.
- Breakdown of soil structure, increasing erosion of the banks.
- Decreased water quality through contamination by urine and faeces. This will result in an increase in nutrient levels which in turn favours weed and algal growth.

Stock management is about controlling access – excluding them when they are most likely to cause damage. Some landowners prefer to keep stock out permanently while others limit access to times when the native plants are not flowering and the streambanks are stable. There is a range of fencing options suitable for use along rivers. These are described in detail in the book *A Guide to Riparian Vegetation and its Management* by Sarah Munks which is available from good bookstores.

Alternative watering supplies may be needed for stock. There is a range of innovative pumps, troughs, and stream access design systems that have been developed for use along rivers. For information on alternative watering systems contact your local Bushcare officer.

Weeds

Weed infestations occur in disturbed environments. Rivers are naturally prone to soil disturbance through flooding. Seeds are transported by flowing water. In many riparian areas natural disturbance is compounded by unrestricted stock access. Weeds will compete with native species for light and nutrients, often growing faster than their native counterparts. The severity of weed infestations in riparian vegetation increases as the stream or river flows downstream, particularly as it flows through the highly developed alluvial soil flats.

Willows, gorse, hawthorn and blackberry are the major weeds along rivers. In many situations these species have transformed riparian vegetation from a native to an introduced flora. Information on weed management and control is contained in **Kit 3 Weeds in Your Bush**. For information on managing willows refer to the *Willow Management Guidelines* available from the Department of Primary Industries, Water and Environment (DPIWE). Additional information can be obtained from the regional weed officers, DPIWE.

Woody debris

Large woody debris is a term used to describe river snags. River snags include large limbs, branches and occasionally complete trees. They are significant because they provide habitat for a range of species, including fish, invertebrates and microscopic organisms. They also help to reduce the energy of the stream and are a source of organic matter for some animals to feed on. De-snagging rivers leads to loss of habitat and increases flow rate which results in channel erosion. This is more likely to occur when the removal of snags is combined with straightening of channels.

Riparian vegetation is an important source of woody debris for rivers and its removal or absence disrupts the ecological balance of the stream. If woody debris is causing a problem it can be realigned so that it lies at an angle of 20-40° to the bank to stop flooding or erosion. Advice should be sought before removing or realigning debris from the River Engineer, Department of Primary Industries, Water and Environment.

Revegetation

Retaining healthy riparian vegetation is the cheapest way of preventing degradation. If you have any intact riparian bush protect it. If you have only isolated plants or small patches left, ensure that these are not removed during rehabilitation works, such as willow removal.

Some guidelines for revegetating along rivers are:

- Survey river sections or tributaries that have riparian bush in good or excellent condition. Record the different species present and note which ones are dominant. This will be useful when deciding upon a seed or planting mix.
- The species mix should reflect the vegetation types that would typically occur along the river. This information will come from the surveys. Preferably a range of species should be used, including trees, shrubs and ground covers. The roots of the trees and shrubs will penetrate deep into the soil profile and help to bind the soil together. The ground cover plants will reduce the amount of bare ground and help to trap sediments and nutrients from the adjacent land.
- As part of the survey, note where particular species occur in relation to the river. For example, woolly tea-tree most commonly occurs on the edge of the stream while blackwood and dogwood occur further away. Tea-tree may find it too dry away from the river while blackwood and dogwood may find it too wet if planted on the river's edge. Herbs, small sedges, rushes and grasses occur along the edge of the stream and are very important for binding the soil. It is important to try and replicate this pattern when revegetating the banks.

Managing by condition

The best management regime for riparian bush will depend on the condition of the bush. Management guidelines based on the condition of the bush are given below. However, the specific needs of threatened plants may override these recommendations. If you are unsure what condition your bush is in refer to **Kit 1 Bush on Your Farm**.

Excellent condition

Riparian bush in excellent condition is characterised by:

- High levels of native species richness and a diverse range of life forms, including herbs, sedges, rushes, grasses, shrubs and trees. These species may form discrete zones parallel to the stream which change as conditions such as drainage and exposure vary.
- Virtually no weeds and those that are present are 'naturalised' species such as the flat weeds and *Prunella*.
- High aquatic and terrestrial habitat diversity.
- Natural woody debris.
- A channel that has not been straightened or altered in other ways.

Riparian vegetation in this condition is an asset, both to your own property and to the greater catchment. Do not change your management regime unless there is a good reason to do so.

Much of this bush is confined to areas that have been relatively free of human disturbance in the past. However, this land is increasingly coming under pressure. Typically, it occurs in the upper parts of catchments or along small tributaries so it has an important functional role within the catchment.

It is important to continue to exclude stock and ensure that fire does not burn into riparian areas. Flooding provides any disturbance that the plant community is likely to need for regeneration. Avoid changing the flow regime through irrigating or damming as this may eliminate the flooding that is necessary for regeneration. The stream channel should also be left untouched. Woody debris that has accumulated in the stream is likely to be occurring at natural rates and is important for providing habitat and for reducing flow rates.

While these areas are relatively weed free it will be necessary to monitor them for any invading weeds. These weeds may come from areas upstream or from adjacent areas, or may be carried in by birds. Serious weeds of riparian bush include willow, gorse, hawthorn and blackberry.



Good condition

Riparian bush in good condition is characterised by:

- Fragmentation of patches of native vegetation leaving small isolated remnants separated by pasture, or continuous riparian vegetation that is less than two metres wide.
- Moderate to low diversity of native plant and animal species.
- Relatively high levels of weed invasion which can include introduced grasses, flat weeds, blackberry, briar rose, and some gorse and hawthorn.
- Actively eroding streambanks, causing areas of bank instability and possibly leading to excessive accumulation of woody debris in the stream.
- Moderate to low diversity of habitats for native animals and plants.
- Stock access which is associated with soil compaction, structural damage to banks, and a reduction in water quality.

Riparian bush in good condition is usually found in bush run country where fire may occur at regular intervals, and grazing, while not heavy, is uncontrolled. It is also found adjacent to pasture in areas where cattle access is restricted but is still too frequent. Stock need to be excluded at least until the vegetation has recovered. This may take over 20 years in some vegetation types. If recovery occurs without significant weed invasion and there is a diverse range of species it would be beneficial to exclude stock. However, if weeds become a problem crash grazing may help to reduce their number. Crash grazing should take place when the weeds are flowering, the banks have low moisture levels, and there is no risk of erosion. However, this will only be a short-term solution and a more active weed control program will be needed. See **Kit 3 Weeds in Your Bush** for more detailed information on weed management.

Fire should be excluded. While fire may be a useful tool for encouraging shrub and tree regeneration it is likely to cause damage and may simply encourage weeds and erosion.

Poor condition

Riparian bush in poor condition is characterised by:

- Very little native vegetation with only the occasional tree or clump of shrubs present.
- A high proportion of pasture areas or weeds such as willow, gorse or hawthorn.
- Stock damage in the form of stock pathways, bank erosion, soil compaction, animal faeces in and around the water's edge, and sediment in the water.
- Little suitable habitat for native plant and animal species.
- Significant and active erosion which is not natural.

Riparian bush in poor condition commonly occurs in areas used for intensive agriculture. Many of the rivers flowing through the floodplains of the state are in poor condition and are dominated by willow. There has been much effort and money spent removing willows from these rivers in order to return them to a more natural state. Simply fencing off these areas and waiting for natural regeneration may not be enough because of poor seed availability and weed invasion. Rehabilitation of these sites will require an active strategy of direct seeding or planting. It is important that these areas are revegetated as soon as possible following any works. If rivers are not revegetated it is likely that they will become further degraded and water quality for both humans and native fauna will decline.

Stock control is essential. Rivers in poor condition appear to be highly prone to damage by stock, especially once willows and other weeds have been removed and there is free access. Fencing should accompany revegetation.

Further reading

There are a number of useful publications that provide more detailed information on managing riparian vegetation.

Riparian Management 1. Managing Riparian Land

Riparian Management 2. Stream Stability

Riparian Management 3. Water Quality

Riparian Management 4. River Ecosystems

Riparian Management 5. Land-based Ecosystems

Riparian Management 6. Managing Stock

Riparian Management 7. Managing Snags in Rivers

This series of seven fact sheets provides a good overview of some of the important management and ecological issues associated with rivers. They are available from the Resources Assessment Branch, Department of Primary Industries, Water and Environment or the Land and Water Resources Research and Development Corporation, GPO Box 2182, Canberra ACT 2601.

Willow Management Guidelines by Greg Parker and David Bower, 1996.

These guidelines are essential for anyone contemplating willow removal. The book is an excellent practical guide that provides a step-by-step method for removing willows. It is available from the Department of Primary Industries, Water and Environment, Hobart.

A Guide to Riparian Vegetation and its Management by Sarah Munks, 1996.

This publication gives a broad overview of river systems, including their ecology, geomorphology, management and rehabilitation. It is especially useful for topics such as planning rehabilitation, fencing, and different approaches to management and revegetation. It is available from the Department of Primary Industries, Water and Environment.

Waterplants in Australia: A Field Guide by G R Sainty and S W L Jacobs, CSIRO Division of Water Resources, Canberra, 1994.

This is a handy guide for people wanting to become familiar with aquatic and semi-aquatic plants in Australia. It is available from major bookstores.