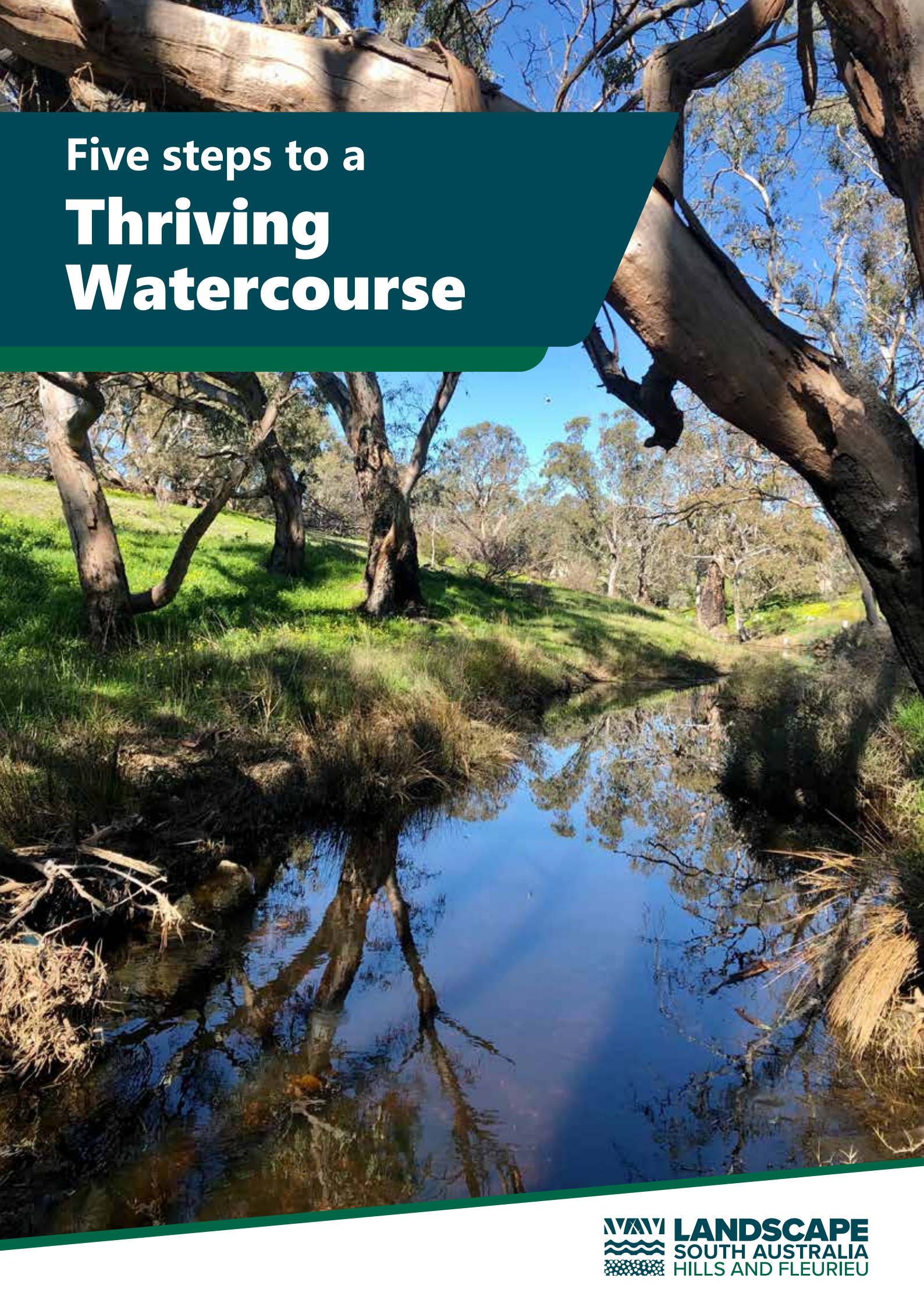


Five steps to a Thriving Watercourse

LANDSCAPE SOUTH AUSTRALIA HILLS AND FLEURIEU

Welcome

You're here because;

- You've got a creek or watercourse running through your property.
- You want your creek to thrive—clear water, healthy habitat, and full of native fish, frogs, and birds.
- You're keen to do the right thing, but not quite sure where to start—maybe it's weed control, erosion, or keeping stock out?
- You're ready to put in the time and a bit of cash to look after it properly.
- And you want to make sure you're not accidentally breaking any rules around watercourse management.

This guide is here to help. It takes you through five straightforward steps to protect and manage your local watercourse—whether it's a creek, swamp, river or even a seasonal drainage line.

There aren't many places more rewarding than a healthy, thriving watercourse on your property.

All the best on your journey—we're here to help you make it a success.

About this guide

This guide is part of a series designed to support smart, well-timed land management actions for key areas on your property:

- Soil
- Native vegetation
- Watercourses
- Weed control
- Revegetation

Using one or more of these guides will help you make informed decisions, care for natural resources, and boost your efficiency as a land manager. Choose the guides that suit your needs—or use all five to create a complete stewardship plan for your property.

The content draws on the knowledge and experience of our stewardship team, local landholders, and partners working across the Hills and Fleurieu region.

We wish you every success.

If, after reading this guide, you're thinking about kicking off a weed control or revegetation project along your watercourse—great choice! Be sure to check out our companion guides: **Five Steps to Effective Weed Control and Five Steps to Thriving Revegetation.** They're packed with practical tips to help you get the job done right, from planning through to long-term care.

Acknowledgement of Country

The Hills and Fleurieu Landscape Board acknowledges First Nations as the first people of the lands and waters where we live and work. We respect the Peramangk, Kaurna, and Ngarrindjeri peoples, past and present, who have cared for Yerta/Ruwe for generations, nurturing its life, stories, and landscapes. We recognise their deep knowledge, spiritual belonging, and enduring connection to Country.

We are committed to walking alongside First Nations, listening, learning, and working together to protect and restore these lands and waters.

Contents

Introduction:

Towards a thriving watercourse

What do we even mean by 'watercourse'?
Do you have a winter creek, a raging river, or just a trickle that flows for a few weeks a year? Legally, they're all 'watercourses.' A watercourse is any channel where water flows—whether permanently or occasionally—including dams, lakes, reservoirs, estuaries, and wetlands.

Watercourse management is challenging, water usage is highly politicised, using water and doing works in and around a watercourse is bound by legislation, even on your own land.

Common watercourse challenges in the Hills and Fleurieu

The Hills and Fleurieu region has endured significant land clearance since colonisation, causing water to flow more rapidly into creeks than it used to. Rapid runoff can drive erosion and sedimentation events, polluting and damaging creeks and dams.

The more stress a creek is under locally, the less likely it is to withstand rapid changes in upstream flow. Managing local stressors in your watercourse will build its resilience and help to restore stability, water quality and ecosystem health and give it a much better chance of staying healthy.

Weeds love damp conditions, and watercourses are prime real estate for invaders like blackberry and briar rose. Flowing water constantly brings in new seeds, making weed control an ongoing challenge.

Livestock can also harm watercourses. While grazing may seem like a way to keep the area open and reduce fire risk, it can degrade waterways, introduce pathogens, and impact animal health. Fortunately, there are ways to minimise damage while allowing occasional grazing.

Erosion is a natural process, but sudden acceleration of erosion may need your intervention to avoid losing important land or infrastructure.

Watercourse ownership responsibilities

In South Australia, if a watercourse runs through or is the boundary of your property, you are responsible for its care—unlike in some other states where easements or government tenures exist.

Under the Landscape South Australia Act 2019, landowners must take reasonable measures to prevent damage to the bed and banks of the watercourse. This responsibility—and the costs—fall entirely on the landowner.

Property boundaries can sometimes run through a watercourse, meaning responsibility may be shared with your neighbour. Understanding your boundary is key to effective watercourse management.

Permits and approvals

Undertaking works within a watercourse or floodplain needs to be carefully planned to protect the environment and neighbouring properties. It is most likely a permit or approval under the Landscapes SA Act 2019 will be required. Section 104(4) of the Landscapes SA Act 2019 requires a water affecting activity permit application to be submitted the Hills and Fleurieu Landscape Board for assessment. Written approval must be received before works commence. Such activities deemed Water Affecting Activities include, but are not limited to:

- dams, walls or other structures that collect and hold surface water
- weirs
- swales and contour banks
- levee banks or mounds
- crossings, bridges, or other buildings
- draining or discharging water (i.e. stormwater discharge, pumping water out of dam)
- erosion control and depositing material
- excavations (i.e. desilting or re-alignment)
- destroying vegetation.

If unsure whether the work you plan to undertake within the watercourse or floodplain requires a permit, please contact us.

To further support important work in watercourses the board has developed 'Current Recommended Practices' that set out very specific procedures so that particular water affecting activities can be exempt from a permit.

Such activities include but are not limited to: construction, repair or removal of structures, draining or discarding water, erosion control, excavations and vegetation removal.

For further information on water affecting activities, including permit application forms, Current Recommended Practices and resources go to the Landscapes Hills and Fleurieu website.

Other approvals

Other approvals may be required when undertaking works within your watercourse. It's best to check.

- Development approval authorised by local councils i.e. construction of structures.
- Native vegetation clearance authorised by the Native Vegetation Council i.e. removing native vegetation.
- Dredge License authorised by Environment Protection Authority i.e. excavations, and dewatering.

Watercourse management can feel overwhelming, but the key is to start. This guide will help you focus your efforts for the best results—boosting farm productivity, supporting nature, and improving your own wellbeing.

Rare native freshwater fish, mountain galaxias

STEP 1

Define your watercourse goals

Which watercourse benefits do you want to achieve?

It is important to feel clear about the outcomes or key benefits you want to achieve through managing your watercourse. This will help to guide the order of interventions you choose to take.

Key benefit: erosion control

If you have a large erosion point on your property which is actively moving and/or constantly shows bare soil, you will need to address this in the first instance. Please go directly to Step 5 of this guide to determine which interventions may be suitable. Contact Landscapes Hills and Fleurieu for further advice and to discuss Water Affecting Activity permitting.

Key benefit: livestock wellbeing, water quality

If you run livestock, fencing your watercourse will have benefits such as reducing livestock injuries, improving drinking water quality and health for animals, providing shade and shelter, improving grazing flexibility and the ease of livestock rotations.

Key benefit: habitat for wildlife, improved water quality

Improvements in watercourse habitat through the exclusion of livestock, removal of exotic trees and woody weeds, will support birds that prefer watercourse habitats, many of which have been declining in our region like the crested–shrike-tit or Bassian thrush. It will also support our decimated populations of native fish such as the mountain galaxias, and southern pygmy-perch.

Removing exotic trees will prevent water fouling and de-oxygenation caused by rotting deciduous leaves, as well as erosion caused by these trees growing in the middle of the creek and their excessive shading of the banks.

Watercourses and their ecosystems rely on balance—water sustains plants, and plants filter sediment to keep water clean. Historically, summer rains provided essential low flows, supporting water-dependent plants and animals. However, with so many dams in the landscape, these flows have been harvested in many areas, harming local ecosystems.

A simple siphon system can help by releasing small amounts of dam water into nearby creeks below a dam during summer, benefiting both plants and wildlife.

Key benefit: watercourse stability - less erosion and/or sedimentation

To reduce erosion and sediment runoff, consider:

- Removing exotic trees and woody weeds to prevent bank scouring and bed deepening.
- Excluding livestock with fencing to protect fragile creek banks.

These actions help maintain a healthier, more resilient watercourse.

Key benefit: fire management

Vegetated watercourses in the landscape can reduce the speed of high winds, which slows down wildfire. Native vegetation can catch the flying embers before they reach critical infrastructure or spread further.

Key benefit: human wellbeing, honouring Aboriginal cultural heritage

Creeks, rivers, and waterholes hold a special place in our hearts—they're where we played as kids, had family picnics, and watched waterfalls after big rains. If you have a permanent pool, it's likely been a gathering place for many generations, even providing food like yabbies and fish.

Caring for your creek not only creates a peaceful sanctuary for you but also ensures it thrives for future land stewards to enjoy. Protecting these waterways benefits us all.

Aboriginal heritage sites

Creeks and rivers of our region bear some of the richest cultural heritage of any landscape feature. If you discover something you believe might indicate an Aboriginal heritage site, object or ancestral remains, please do not disturb it, see the fact sheet on the Hills and Fleurieu website or call (08) 429 9406, or email aar.conservation@sa.gov.au for more information.

STEP 2

Tackle weeds and pest animals

Weeds

Weeds – you are not alone! There are very few watercourses in our region that don't have some level of weed incursion, making weeds the most common threat to watercourse health. Many weeds originate from cooler damper places and grow especially well in our watercourses due to the higher levels of disturbance, moisture and nutrients. Any invasive plant that is not locally native to the area is considered a weed or exotic. Staying on top of watercourse weeds is critical to watercourse health.

Impact of weeds. Left unchecked they can quickly invade the bank and channel, becoming monocultures that exclude native plants – think blackberry. Weeds like willows can drive erosion processes through diverting flow and shading banks so that naturally stabilising groundcovers like grasses can't grow.

Focus your ID skills on the most common woody weeds. It is almost a certainty that you will have one or more of the most common watercourse-loving woody weeds of our region - blackberry, broom, gorse, briar rose, olive and Arum lily. Common exotic deciduous trees invaders include willow, desert ash and hawthorn. These plants are highly invasive, they are 'declared' under the SA Landscapes Act 2019, and some are even classified as Weeds of National Significance (WONS). Some basic plant identification skills are critical. Once you know which weeds you have, you can start to gather the specific information on controlling that particular weed. You can check out our Five Steps to Effective Weed Control guide for more information on planning a weed control program.

Declared weeds

As a property owner, you have a legislative responsibility to control 'declared' weeds. The first step is to develop an effective plan to tackle the weeds in your watercourse. The Five Steps to Effective Weed Control guide available from our website will help get you started.

You should consider your time and budget, biology of the plant and when is the best time to control (seasonal), timeline for control, method of weed control, the number of hours you have available or budget for paying a contractor, and whether a water affecting activity permit is required. Expect to do some level of watercourse weed control every year.

Consider: Watercourse weed control is often best done in summer when water levels are low or non-existent. Some weed species, specifically bulbs like watsonia or three-cornered garlic are more effectively tackled in spring.

When starting out, keep the following weed control prioritisation principles in mind:

- Know your weed species and map them
- Prioritise controlling weeds in and around important habitat assets like high-quality native vegetation and permanent pools.
- Prioritise environmental weed species that can be easily eradicated due to low abundance before their numbers increase and become established, for example you might have a big patch of blackberry but only two Arum lily plants. Do the Arum lily first!
- To avoid spreading seeds, begin weed control in areas where there are least weedy plants and push back towards bigger patches.
- Consolidate your effort by prioritising weed control where it has been undertaken in previous years before starting in new areas.
- Regularly inspect to look for new weed incursions while they are less abundant and easier to control, particularly beside vehicle, walking tracks, and animal tracks.
- Expect and budget to do follow-up weed control for many years.

Please refer to our Five Steps to Effective Weed Control guide and Action Plan template for a comprehensive guide to planning, budgeting and carrying out a successful weed control program.

Do you need a permit or approval for weed control?

Controlling weeds in a watercourse and its floodplain has potential to cause damage to the watercourse. Disturbance to bed and banks of a watercourse can cause erosion, both through the action of the heavy machinery disturbing soil, and removing the weedy vegetation cover, exposing bare soil to flowing water.

Before deploying heavy machinery to a watercourse, clearing large trees or slashing large woody weed infestations, speak to one of our Landscapes Hills and Fleurieu stewardship officers to discuss your plans so we can provide tailored advice. In some cases, a water affecting activity permit from the board may be required before works commence in accordance with Landscape South Australia Act 2019.

If the vegetation you wish to remove is native, you will very likely need to get approval from the Native Vegetation Council. If you are not sure, please contact Landscapes Hills and Fleurieu Landscape Board at Mt Barker on (08) 8391 7500.

Tall reeds

Large native reeds like bulrush (*Typha* sp.) and common reed *(Phragmites australis)* provide vital habitat for birds like reed warblers and help improve water quality by filtering excess nutrients. They should be left undisturbed unless they threaten infrastructure or spread aggressively.

In slow-flowing water, these reeds can trap sediment, especially near bridges and stock crossings. If needed, they can be legally cleared following the Clearance of Common Reeds factsheet. For more details, contact the Native Vegetation branch of the Department of Environment and Water (DEW).

Timing

Except for bulb weeds, most watercourse weed control—such as removing woody weeds and exotic trees—is best done in summer and early autumn. Lower water levels and dry creek beds make access easier and allow for more control options, including herbicides.

For more details, check out Five Steps to Effective Weed Control.

Pest animals

Rabbits, foxes, deer, and goats harm watercourses by overgrazing, preventing plant regeneration, causing erosion, and spreading weeds. Weedy watercourses can also shelter these pests.

Control methods vary for each species. Find more details on the *Landscapes* Hills and Fleurieu website or PestSmart. If you plan to destroy a fox den or rabbit warren in a watercourse, check with us first—you may need a Water Affecting Activity permit.

Western grey kangaroos are abundant in the Hills and Fleurieu region and can damage native vegetation and revegetation efforts. Kangaroo-proof tree guards help protect young plants. Various control options are available— more details can be found in our online references.

Kangaroo-proof tree guards

STEP 3

Fence to exclude livestock

Stock exclusion - why?

Keeping livestock out of your watercourse immediately improves water quality. Fencing is the most effective way to protect water, prevent erosion, safeguard native plants, and boost farm productivity.

Livestock damage watercourses by grazing and trampling vegetation, compacting soil, polluting water, leaving bare soil prone to erosion, destroying aquatic habitats, and spreading weeds.

Benefits to your animals. Excluding livestock from your watercourse benefits both the environment and your farm. A fenced watercourse reduces the risk of injury, makes livestock management easier, and allows vegetation to grow, providing shade and wind protection.

Studies show that livestock growth rates can increase by up to 25% when they drink from a trough instead of directly from the watercourse.

Crash Grazing

'Crash grazing' involves grazing a small area with the maximum number of animals for a short time. If your fenced watercourse is near buildings or sheds, strategic grazing can help reduce grassy fuel loads.

To prevent soil damage and habitat loss, carefully plan the timing, duration, and area size. A good rule of thumb is to remove animals before bare ground appears and avoid crash grazing from May to August.

For more details, see Caring for Creeklines to Reduce Bushfire Risk in our online references.

Effective watercourse fencing

Fencing to effectively protect water quality and habitat values requires specific design features. Planning out watercourse fencing on an aerial photo of your property will allow for accurate lineage, costings for materials, and/or quotes from contractors.

Distance from the banks. When planning your fence layout ensure there is enough distance between the new fence-line and the top of the bank to avoid losing your fence in the first flood. The wider the better!

Minimum buffer width. A minimum buffer width of 10 to 20 metres on each side is recommended to protect water quality and provide ecological benefits.

Ideal buffer width. For more comprehensive protection, widths of 30 to 50 metres on each side or more are preferred. This wider buffer helps with better filtration of runoff, provides habitat for wildlife, adequate protection in post-fire scenarios and can prevent soil erosion more effectively. Studies have shown that watercourse bird diversity is highest in areas with a wide stretch of riparian vegetation.

On steep slopes or in areas with highly erodible soils, a wider buffer might be necessary.

In areas with heavy rainfall, wider buffers can help manage runoff and reduce the risk of water pollution. See diagram below as a guide.

Steel fencing protects watercourse after bushfire

Flood gates. If you need to fence across a watercourse to keep livestock out or separate paddocks, a flood gate allows water to flow freely while containing stock. Designs range from simple to complex, depending on livestock type, flood risk, and budget.

Type of fencing. Permanent steel fencing is ideal for watercourses. In flood-prone areas, a six-strand barbed wire fence is better than stock or ringlock fencing, as it allows water and debris to pass through more easily.

For fire resilience, steel or concrete posts are the best options. Creeks recover quickly after fire, so protecting them helps build disaster resilience. If using timber posts, creosote-treated posts are more fire-resistant than CCA-treated ones.

Do you need a permit or approval?

If your fencing project involves pumping or diverting water, excavating vegetation, building a crossing, depositing material, or erosion control, you'll need a Water Affecting Activity permit under the Landscape South Australia Act 2019.

Even if a permit isn't required, consult us for advice to ensure your fence won't obstruct flow or be washed away in the next flood.

Timing. Fencing actions are often best carried out between April and December when soil is softer, and post holes can be dug more easily. Beware of very wet conditions when vehicle access may become difficult. If you intend on engaging a contractor to help with your fencing, plan ahead and engage them early as they will most likely have a preferred seasonal window to work within.

Creek-line fencing plan, indicating buffer widths and fire breaks.

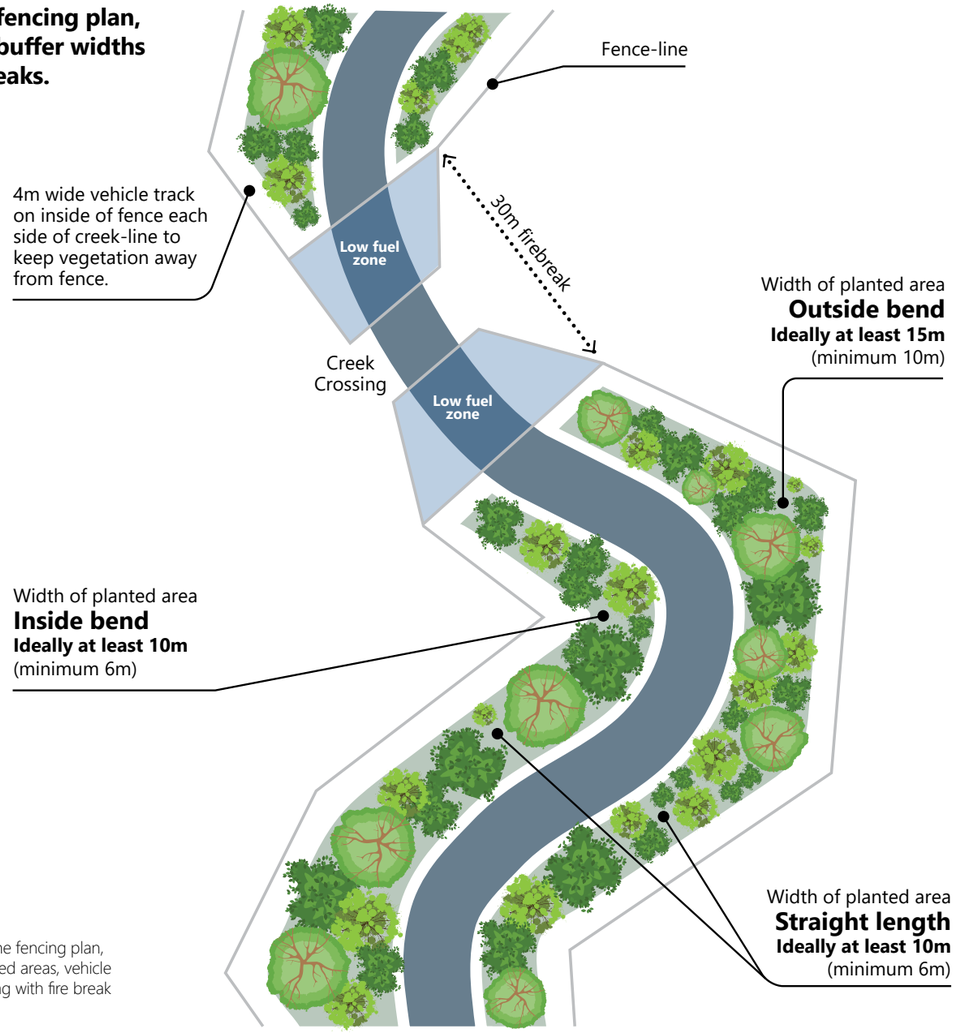


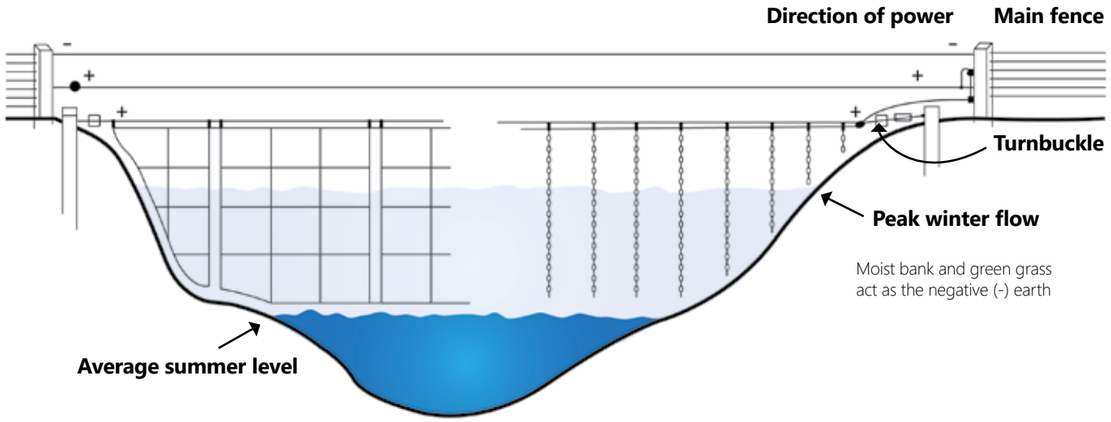
Figure 1 Creek-line fencing plan, indicating vegetated areas, vehicle access and crossing with fire break

Watercourse fencing design options

Fencing designs adapted from Upper River Torrens Landcare Group - Datasheet - Watercourse Fencing

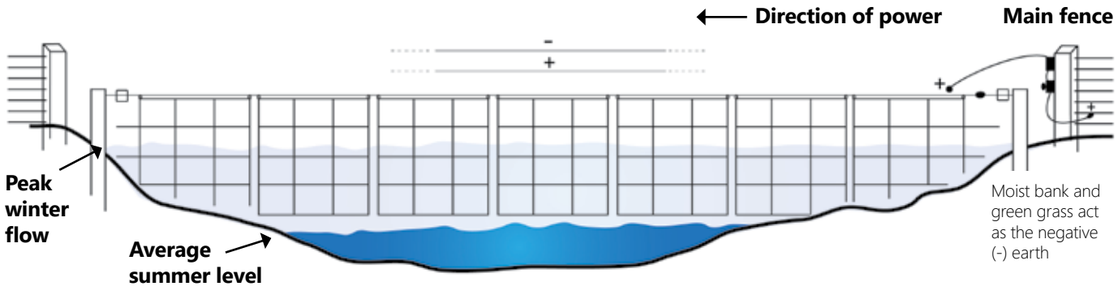
Permanent fencing for deep, stable channels

Suited to deep, narrow crossings. **Hinged galvanised mesh panels or galvanised chain.** Steel cable (6, 4, 8, 10 or 12mm) is used to carry the fence. This is anchored with engineering eye bolts and turnbuckles or tractor strained chain assembly to maintain tension (turnbuckles may not be suitable for straining more than 25 metres). A wire, holding the mesh or chains apart, carries the positive (+) pulse.



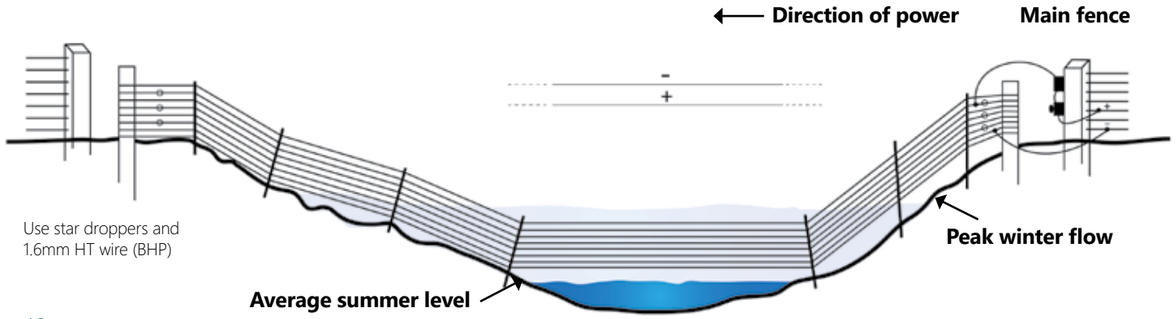
Semi-permanent fencing, which can respond to sudden changes in flow

Suited to wide, flat crossings, including fords
Hinged and separated galvanised mesh panels



Semi-permanent fencing with easily installed and removed sections

Suited to uneven crossings. Wire each section or couple of sections separately. The joins then become the breakaway points. Hand strain.



STEP 4

Native vegetation and revegetation

Creating a place to enjoy nature

Healthy watercourses bring peace and beauty to our lives. When lined with native plants, they become some of the most biodiverse areas on your property, providing sanctuary for birds, frogs, reptiles, turtles, rakali (native water rats), possums, bats, koalas, and a variety of insects and micro-invertebrates.

Aquatic plants like reeds and rushes filter sediment, provide habitat, and stabilise banks. They also reduce flood impact by slowing water flow and minimising erosion.

Vegetated watercourses benefit agriculture by offering shade and windbreaks for livestock, supporting pollinators, and providing natural pest control in horticulture and viticulture.

Vegetated watercourses can be high in biodiversity

Do you need to revegetate?

If you've recently fenced your watercourse and excluded livestock, it's a good idea to wait a year before planting. Often, removing grazing pressure allows native plants to regenerate on their own, and watercourses can bring in native seeds, especially after floods.

Be cautious of weeds. If you're unsure about regenerating plants, check our online resources or contact a stewardship officer at Landscapes Hills and Fleurieu.

If your watercourse has a thick layer of exotic grasses like phalaris, focus on planting robust, fast-growing trees and shrubs, and replant sedges in small, manageable patches. Even a fenced watercourse with pasture grasses and a few scattered red gums is more biodiverse than an unfenced, grazed watercourse.

Are revegetated watercourses a bushfire risk?

You may be concerned that the vegetation in your creek-lines is a fire risk. While this is understandable, it is often not the case. Many vegetated creek-lines can help reduce fire risk to your built assets by acting as a windbreak. The species you choose and how to plant them in revegetation projects can also reduce fire risk.

For more information on which species are suitable for your region see the native vegetation section of our website. For more information on watercourse management to reduce bushfire risk refer to Caring for Creeklines to Reduce Bushfire Risk from the Landscapes Hills and Fleurieu website.

Planning a revegetation project

Please refer to our Five Steps to Thriving Revegetation guide and Action Plan template for a comprehensive guide to planning, budgeting and carrying out a successful revegetation project in your watercourse.

What plants do you already have? If you already have healthy, mature Eucalypts dotted along the banks of the watercourse you probably don't need to plant any more of this species. Even dead trees are valuable, as they offer habitat for predatory and hollow nesting birds.

Get to know common watercourse natives

Common tree species for planting on top of the banks include river red gum *(Eucalyptus camaldulensis)*, smooth-barked manna gum *(E. viminalis ssp. Viminalis)*, blackwood *(Acacia melanoxylon)*, drooping sheoak *(Allocasuarina verticillata)*, silver banksia *(Banksia marginata)*, river bottlebrush *(Callistemon sieberi)*.

Silver banksia *(Banksia marginata)*

River red gum *(Eucalyptus camadulensis)*

Blackwood *(Acacia melanoxylon)*

River bottle-brush *(Callistemon sieberi)*

Drooping sheoak *(Allocasuarina verticillata)*

Smooth-barked manna-gum *(Eucalyptus viminalis viminalis)*

Common shrub species for planting on top of the bank for the bank include: prickly tea-tree *(Leptospermum continentale)*, silky tree-tree *(Leptospermum lanigerum)*, varnish wattle *(Acacia verniciflua*); swamp wattle *(Acacia provincialis)*.

Varnish wattle *(Acacia verniciflua)*

Flowering varnish wattle along creek

Prickly tea-tree *(Leptospermum continentale)*

Swamp wattle *(Acacia provincialis)*

Christmas bush *(Bursaria spinosa)*

Silky tea-tree *(Leptospermum lanigerum)*

Red-fruited cutting grass *(Gahnia sieberiana)*

Clasping goodenia *(Goodenia amplexans)*

Species for in or near the watercourse

Sedges and rushes can be planted anywhere near, or in, a watercourse, densely from ½ metre to 1 metre apart. See our website for the Sedge and Rush Planting Guide for Creeks and Dams in our online references for species lists and preferred moisture zones. These plants are very easy to grow and plant, they are robust and will (once established) begin to colonise to create ideal habitat for frogs, reptiles, native fish and macro-invertebrates.

Common in-channel species for the bed include tall sedge *(Carex tereticaulis)*, knobby club-rush *(Ficinia nodosa)*, pale rush *(Juncus pallidus)*.

Permanent pool fringed by sedges

Stiff flat-sedge *(Cyperus vaginatus)*

Creek lined by reeds and sedges

Jointed rush *(Juncus kraussii)*

Knobby club-rush *(Ficinia nodosa)*

Tall sedge (*Carex tereticaulis)*

Revegetating for the inhabitants of your creek

You may already hear frogs in your creek, as they're sensitive to environmental changes in aquatic habitats. Frogs thrive in aquatic and semi-emergent plants like reeds and sedges, which help tadpoles crawl out of the water. You can identify species through the Frogwatch app and contribute to citizen science.

Many bird species depend on healthy watercourse habitats. Waterbirds use riparian vegetation for shelter, and reed warblers prefer dense, tall reeds. Woodland birds like the crested shrike-tit feed on insects in mature red gum canopies. Studies show that watercourse bird diversity is highest in areas with extensive riparian vegetation.

Reptiles also play a key role in riparian ecosystems. To encourage them, leave timber and rocks around your watercourse for shelter and warmth. These features also attract insects, which reptiles feed on. Snakes are drawn to healthy watercourses due to the abundance of food, including frogs, lizards, and eggs. The best approach is to wear rubber boots and leave the snakes undisturbed.

Native fish

If your watercourse has water for much of the year, it may be home to native fish. Sadly, native fish populations have declined due to threats like habitat loss, damage to riparian vegetation, reduced seasonal flows, livestock access, excessive dams, exotic fish species, and the loss of springs and permanent pools.

In the Mount Lofty Ranges, four out of 20 native freshwater fish species are regionally extinct, and ten are threatened. Protecting watercourses will help support these fish.

For identification, check the Fish Identification Chart on our website featuring the most common species in the Adelaide Hills and Fleurieu.

Eastern banjo frog

Southern pygmy perch

Red belly black snake

Rakali

Willy wagtail nest made from spider webs and grass with 3 eggs in red gum saplings

Permanent pools in creeks are critical habitat for native fish

STEP 5

Knowing when and how to manage erosion

Watercourses are dynamic systems, shaped by factors like water flow, channel structure, topography, soils, land use, and vegetation. Erosion and sedimentation are natural processes, but accelerated erosion can damage native trees, infrastructure like crossings and fencing, and reduce farming. It can also increase water turbidity, lowering water quality and causing siltation in permanent pools downstream.

To address erosion in your watercourse, follow these steps:

1. **Observe and monitor** – Is the erosion active or worsening, or has it slowed down?
2. **Identify the type of erosion** – Is it bed deepening or bank slumping?
3. **Assess impacts** – Determine if any natural assets, infrastructure, or farmland are being affected. If not, and the erosion is slowing, intervention may not be needed.
4. **Seek advice** – If intervention is required to protect infrastructure, consult experts for suitable erosion control solutions.
5. **Use skilled contractors** – Ensure any complex interventions requiring permits are carried out by experienced professionals.
6. **Routine inspections and maintenance** – Regularly check and maintain your erosion control measures.

Watercourse erosion can be complex and is frequently driven by processes well beyond your property boundaries. Effective repairs can be costly and unsuccessful repairs even more costly!

Seeking professional advice is always recommended.

What to look for:

Erosion can take several different forms – you may see bare soils, a sudden step in level of the bed of the watercourse where a small waterfall has formed, vertical or undercut banks, bank scouring around a fallen tree, and/or exposure of tree roots. Knowing when to intervene and being proactive in tackling erosion in your watercourse will help stop small erosion issues growing, causing more damage and becoming a significant cost burden.

The following images are different types of erosion you may see occurring in your watercourse.

Bed deepening is the first step of an erosion process

Bank failure follows bed erosion and bank slumping

Livestock access can accelerate bank slumping

Bank slumping erosion

Bank scour caused by invasive willow trees

Solutions for erosion

Unfortunately, disastrous attempts at controlling erosion often come to our attention, requiring VERY costly solutions.

A Water Affecting Activity (WAA) permit is required before installing, repairing, or removing erosion control structures in a watercourse, in line with the Landscape South Australia Act 2019. Be sure to discuss your plans with us so we can provide tailored advice, confirm your requirements, and support your erosion control project.

For structures like rock walls over 1m in height, you may also need development approval from your local council. If this is the case, you won't need a separate WAA permit, but it's important to confirm with your council.

The WAA permitting process not only ensures compliance with the Landscapes Act but also helps prevent costly disasters down the line.

Tackling erosion at its source. Erosion can be worsened by extreme weather events, and it's often exacerbated by uncontrolled livestock access. Cattle, followed by other grazing animals, damage riparian areas through their size, weight, and hooves, which quickly degrade vegetative cover. Fencing out livestock helps maintain vegetation, protecting soil and slowing water flow. Allowing natural or assisted revegetation is the simplest, most cost-effective way to reduce erosion.

Erosion control solution. There are many types of erosion control structures, ranging from low-cost options like bank-stabilising fencing to more expensive solutions such as rock beaching or gabion walls. In some cases, a combination of methods, such as revegetation and rock beaching, may be needed for effective erosion control.

Alignment fencing – simple bank erosion solution

Where erosion control is needed for small or moderate bank erosion, constructing an alignment fence can be a relatively simple way to halt and repair the erosion. The alignment fence will allow sediment and organic matter to deposit behind the mesh in the fence and protect the exposed bank. Vegetation will naturally regrow behind the alignment fence if it is constructed properly

Log sill or pile drop weir – simple bed deepening control solution

Where bed deepening (mini waterfall) erosion is occurring, low-cost 'drop weirs' may help to slow or stop bed erosion. This intervention involves driving posts or star droppers into the bed along the face of the waterfall. This adds a control mechanism which can stop the undermining process from marching further upstream. Consideration should be given to fish passage and if native fish are present, additional bed erosion treatments may need to be used such as rocks.

rock gabion basket for erosion issues threatening infrastructure

Below is a table showing different types of erosion and suitable erosion control solutions. It may be useful to discuss these options with your chosen watercourse professional.

Type of erosion	Erosion Control Technique												
	Revegetation	Bank Battering	Erosion Control Matting	Hay Bale, Silt Fence, Concrete Bag Sediment Trap	Alignment Training – Large Woody Debris	Alignment Training – Wire Fencing	Large Woody Bank Protection	Log Sill Or Weir	Porous Weir Sediment Trap	Rock And Pile Drop Weir	Rock Chute	Rock Beaching	Rock gabion baskets
Bank scour	✓	✓	✓		✓	✓	✓					✓	✓
Bank slumping	✓	✓	✓		✓	✓	✓					✓	✓
Bank undercutting	✓	✓			✓	✓	✓					✓	✓
Bed scour or head-cut	✓		✓	✓				✓	✓	✓	✓		

The information in this guideline is provided for general information You may wish to explore these common solutions further and discuss with Landscapes Hills and Fleurieu as part of your Water Affecting Activity permit application.

Erosion control structures must be designed for the specific situation at hand. Designs should always be discussed with a suitably qualified professional and therefore will not be further detailed in the guide. Please contact Landscapes Hills and Fleurieu for further advice.

Alignment training - wire fencing

Planning and maintaining structures in watercourses

Poorly designed structures like culvert crossings in watercourses and floodplains can have significant negative impacts to neighbouring properties and the environment.

Consider:

- Crossings - a fish friendly design that will allow fish to move both ways through the crossing when flows are low. Also, can water flow freely through the pipes in high flows?
- Bridges - need erosion control protection around their supporting abutments.
- Fences across watercourses to keep livestock out of your neighbour's property, need to be designed to enable flow and not trap debris.
- Erosion control structures – sensitive native habitats close to the erosion control work need protecting
- 'Leaky' weir structures will probably need a permit and may not be approved depending on how much flow is regularly in the watercourse.

Building and maintaining structures, and managing obstructions in your watercourse requires careful planning, consideration to the site and on-going action plan. **Seeking professional advice is always recommended**.

Fish friendly culvert crossing

In-stream vegetation

In-stream vegetation, like native bulrush (*Typha domingensis)* and common reed *(Phragmites australis)*, generally isn't a problem unless it's near built assets. These plants bend easily in flood flows, lying flat and absorbing the energy of the water, which helps reduce erosion. However, dense infestations near structures can block water flow, trap sediment, and cause flooding. This vegetation can often be removed by brushcutting or pruning.

Woody debris, like large tree limbs, is typically beneficial for aquatic habitats. But if it's near built structures (e.g., houses or sheds), it can divert water flows, causing scouring along the banks. In such cases, woody debris may need to be removed. Please contact us before doing so.

Modifying watercourse bed or banks

Excavating or changing any aspect of a watercourse can only occur in accordance with a Water Affecting Activity permit. Discuss any plans with Landscapes Hills and Fleurieu before commencing works.

Do you need a permit or approval?

Installing, repairing and removing a structure, excavating or removing vegetation from a watercourse or floodplain or modifying a watercourse will most likely require a water affecting activity permit from us before works commence in accordance with Landscape South Australia Act 2019. Discuss your plans with us so we can provide tailored advice and confirm your requirements.

Removing native vegetation from a watercourse or floodplain may require an approve clearance from Native Vegetation Council.


Native bulrush is rarely a problem away from built infrastructure


Flood gate fencing allowing for normal flow and fish passage

Using machinery around a watercourse requires a Water Affecting Activity permit

Conclusion

This guide is designed to help you plan steps to improve your watercourse's health. For some, this may simply involve controlling a few weeds, while for more degraded areas with livestock access, it could require fencing, weed control, and revegetation.

Remember, **fencing out livestock** is the most effective way to improve watercourse health.

For detailed guidance on complex treatments, refer to our other resources, including action planning tools and templates like Five Steps to Effective Weed Control, Five Steps to Thriving Revegetation, and Five Steps to Thriving Native Vegetation.

Erosion control should always be done with expert advice from a qualified professional and after obtaining a Water Affecting Activity Permit.

For further support, the **Stewardship** section of our website offers a comprehensive list of references referred to throughout this document.

We wish you every success in creating a healthy watercourse on your property!

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