

# Riparian Planting

*in Hawke's Bay*

**Plant to  
Protect**



Let's protect our land  
and waterways together.

This practical guide covers effective  
planting and maintenance for  
riparian zones on your farm.

[hbrc.govt.nz](http://hbrc.govt.nz)





# Protecting our valuable water resource is important for New Zealand.



The Resource Management Group of the Hawke's Bay Regional Council is ISO 9001 2008 certified.

ISBN 978-0-947499-27-3  
HBRC Publication Number 5394

# Riparian Zones

## Protecting our valuable water resource is important for New Zealand.

It benefits everyone who uses water for drinking as well as economic, recreational, aesthetic, ecological and cultural activities.

Riparian zones are the strips of land beside drains, streams, rivers and lakes. They include areas on-farm where the soils are wettest, such as wetlands, springs or seeps, and gullies.

When fenced and planted, riparian zones maintain and improve water quality on your farm. They function like a sieve, helping to filter out and reduce sediment and nutrients into waterways.

### CONTENTS

Plan to succeed	p.4
Fencing	p.5
Planting	p.6
Shade	p.10
Maintenance	p.13



Fencing and planting adds capital value to your farm.



Well-managed riparian zones prevent stock from getting stuck or drowning in waterways, provide more shade and make it easier to manage stock.



Less sediment means less cost for drain clearing and less risk of flooding.



Mature riparian plantings provide shade to reduce weed growth and reduce water temperature.



Reducing nutrients into waterways decreases weed growth and improves water quality and biodiversity – better swimming and fishing.



Riparian zones stabilise land, limiting loss through erosion.

# Plan to succeed

**Creating a riparian plan is key to getting value for money and doing it right. Your plan should cover fencing, planting and maintenance.**

## Decide what's manageable.

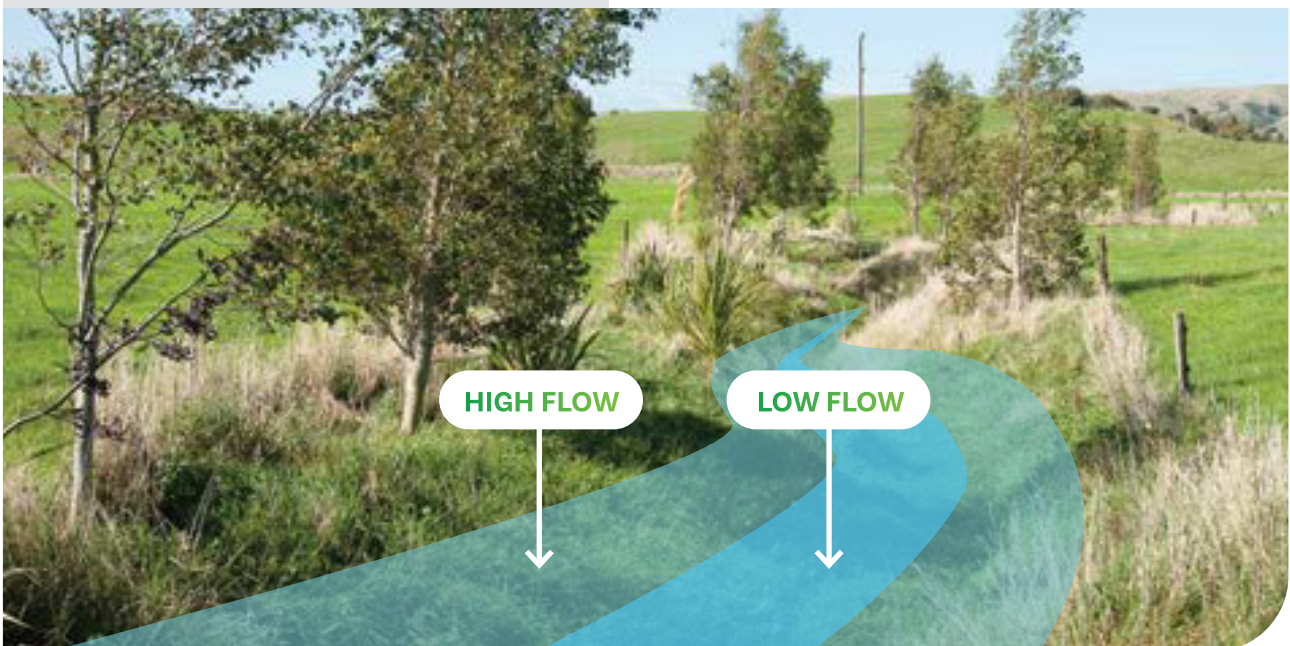
Fencing can be sorted reasonably quickly, whereas planting and maintenance takes longer. Set realistic timeframes and budget for planting. For example, by planting 25% of the area each year, your riparian zones will take four years.

### TIP

Set fences back from the regular high flow height. This may be quite different from the low flow height.

## Deciding where to put fences and what to plant.

- To avoid losing plants in floods work out how your waterway behaves in full flow.
- Pinpoint where run-off or erosion happens most frequently.
- Identify areas where the stream is choked with aquatic weeds, and reaches that are in full sun most of the day.
- Start from the top - your planting efforts will be most effective in small waterways and will have a positive effect downstream.





# Fencing

## Map your waterways and create a fencing plan - work out fence lines, crossing points, shade and drinking water for your stock.

### Keeping stock out.

Livestock trample and graze plants, damage banks and defecate in water. This adds sediment, nutrients and bacteria which reduce water quality. Waterway fencing must be permanent to keep stock out.

### CHECK

Check with Hawke's Bay Regional Council (06 835 9200) to see if you are in a flood control or drainage scheme area. Fencing and planting may need prior approval within these areas.

### Choosing your fencing setback distance.

Planting away from the stream bank makes fence construction and maintenance easier, and maximises the life-span of the fence.

A greater setback distance slows runoff to more effectively filter bacteria, nutrients and sediment before they enter the waterway. It's important on steeper paddocks and heavier soils because they are prone to faster runoff. It also allows more space for trees which create shade - reducing weed growth and keeping streams cooler.

# Planting

## Planting your upper and lower banks will improve stream health more than using grass strips alone.

### What to plant and where?

There can be up to three zones of plant types on a healthy riparian zone, as illustrated below.

To avoid losing plants in floods, sometimes trees and shrubs should be planted a short distance back from the water's edge – but still close enough to provide shade.

Avoid planting deep-rooted species over tile drains.

### CHECK

Set fences back from the regular high flow height. This may be quite different from the low flow height.

### TIP

Use the back page of this guide to work out which plants are best for your area and correct plant spacings. For added diversity look at native bush close-by – if it's growing well, it's likely to thrive on your farm.

### Lower bank zone:

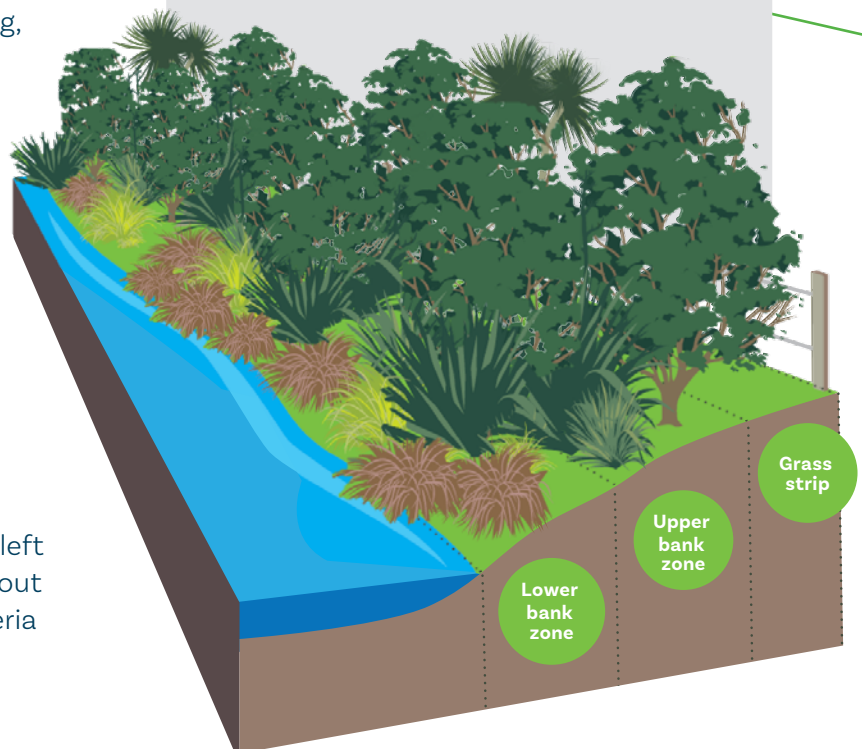
This is the strip of land prone to flooding, where plants have to be most tolerant of waterlogging. Use lower bank zone plants which are well rooted and can survive many days underwater.

### Upper bank zone:

This zone is on higher ground but may still be partially flooded every couple of years. Use upper bank zone plants, which tend to be trees and shrubs to provide shade and shelter.

### Grass strip:

A one metre wide grass strip should be left around all fences. This will help to filter out sediment, phosphorus and faecal bacteria from runoff and prevent plantings from tripping electric wires or being grazed.





## Top 5 Riparian Plants

These plants are ideal to start your planting with – they are hardy, fast-growing, can be planted straight into pasture and don't require shelter.



**Cabbage Tree (tī kōuka)**  
*Cordyline australis*



**Koromiko**  
*Veronica stricta*

### TIP

Having trouble sourcing plants? Get in touch with HBRC, they will tell you where the best places are to source plants from.

Don't let plants overgrow an electric fence, it may become non-operating



**Swamp flax (harakeke)**  
*Phorium tenax*

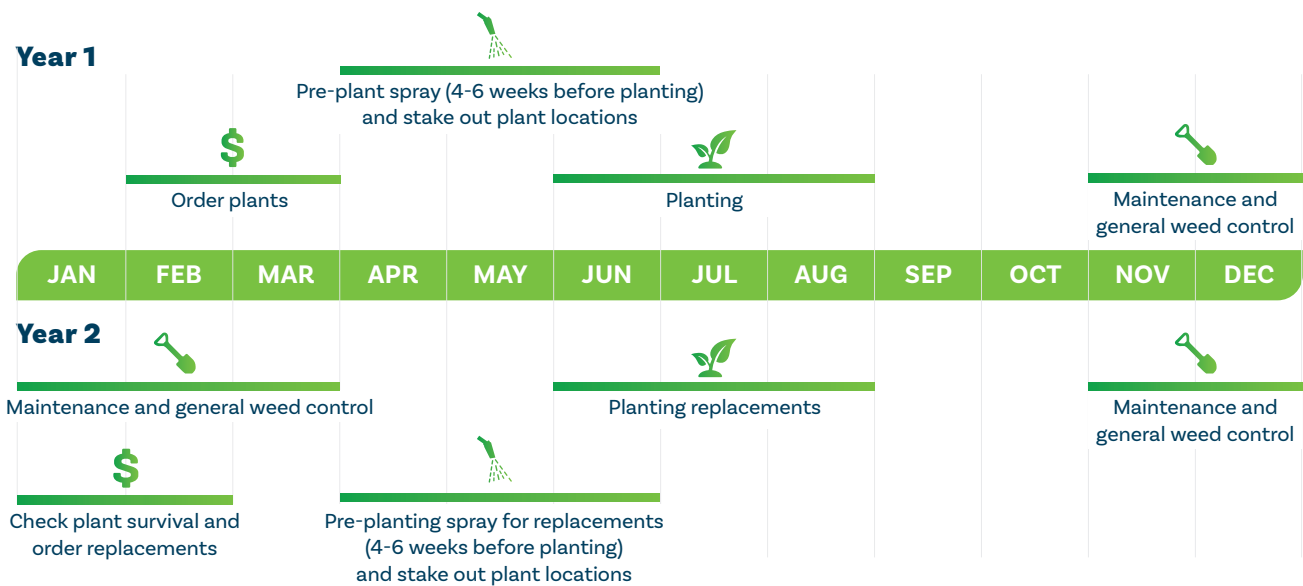


**Summer flowering Toetoe (toetoe)** *Austroderia fulvida*



**Black Matipo (kōhūhū)**  
*Pittosporum tenuifolium*

# Riparian planting calendar: Two year plan



## TIP

### Steps for effective planting technique:

#### 1. Remove any grass or weeds.

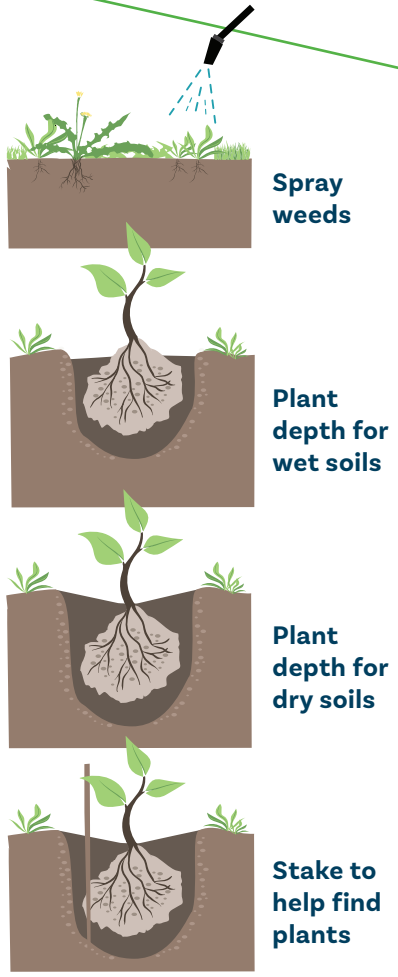
Four to six weeks before planting, spray 1m diameter circles with a glyphosate-based herbicide at the location where you will plant each plant. Check product information to ensure the herbicide does not remain active in the soil or have residual effects.

#### 2. Put the plant in a hole that is big enough to accommodate plant roots without them being curled up or bent at the bottom or sides of the hole.

- a) On permanently wet soils, place the base of the stem (just above where the roots start) about 2cm above the soil surface with soil mounded up to the root ball.
- b) On drier soils, ensure the base of the stem is 1-2cm below the soil surface. Mulch around plants will help keep soils damp, reduce weeds and provide nutrients. Good mulches include straw, staked down cardboard, fine bark chips or wool.

#### 3. Put a stake beside your plants

This helps to find them easily when you are weeding and can see if they have died or need replacing (don't attach the plant to the stake).











## Suggestions for Riparian Plants

There are many more plants that can be planted in a riparian zone, check with your local nursery or the Regional Council what is available and suitable for your setting.

### Key

#### TOLERATES:

-  Full sun
-  Wind
-  Salt wind
-  Frost hardy
-  Poorly drained soil (boggy)
-  Dry soil conditions

#### BENEFITS:

-  Attracts birds
-  Attracts bees
-  Slope stabilisation
-  Filters runoff
-  Shade
-  Fish habitat

Plant name	Type	Tolerates	Benefits	Size (h x w)
<b>Lower bank zone • Space 1-1.5m between plants</b>				
<b>Giant umbrella sedge (upokotangata)</b> <i>Cyperus ustulatus</i>	Sedge	  	 	1 x 1 m
<b>Mountain flax</b> <i>Phormium cookianum</i>	Other	    	   	1.5 x 1 m
<b>Pukio</b> <i>Carex secta</i>	Sedge	    	  	0.75 x 1 m
<b>Summer-flowering toetoe (toetoe)</b> <i>Austroderia fulvida</i>	Grass	    	 	1.5 x 1.5 m
<b>Swamp flax (harakeke)</b> <i>Phormium tenax</i>	Other	    	   	0.75 x 1 m
<b>Swamp sedge (pūrei)</b> <i>Carex virgata</i>	Sedge	   	  	0.75 x 1 m
<b>Upper bank zone • Space 1.5-2m between plants</b>				
<b>Akeake</b> <i>Dodonaea viscosa</i>	Small Tree	    	 	6 x 3 m
<b>Black matipo (kōhūhū)</b> <i>Pittosporum tenuifolium</i>	Small Tree	  	  	8 x 3 m
<b>Cabbage tree (tī kōuka)</b> <i>Cordyline australis</i>	Tree	    	   	10 x 3 m
<b>Five Finger*</b> <i>Pseudopanax arboreus</i>	Small Tree	  	   	8 x 3 m
<b>Kahikatea*</b> <i>Dacrycarpus dacrydiodes</i>	Tree	   	 	40-60 x 4m
<b>Kānuka</b> <i>Kunzea ericoides</i>	Tree	   	  	8 x 3 m
<b>Karamū</b> <i>Coprosma robusta</i>	Shrub	  	  	4 x 1.5 m
<b>Koromiko</b> <i>Veronica stricta</i>	Shrub	    	  	2 x 2m
<b>Kowhai</b> <i>Sophora tetraptera</i>	Tree	   	   	10 x 5 m
<b>Lemonwood (tarata)</b> <i>Pittosporum eugenoides</i>	Tree	  	  	9 x 4 m
<b>Mahoe*</b> <i>Melicytus ramiflorus</i>	Tree	    	  	10 x 3 m
<b>Mānuka</b> <i>Leptospermum scoparium</i>	Small Tree	     	  	4 x 1.5 m
<b>Pigeonwood (Porokaiwhiri)*</b> <i>Hedycarya arborea</i>	Small Tree	  	 	12 x 3 m
<b>Swamp flax (harakeke)</b> <i>Phormium tenax</i>	Shrub	   	   	1.8 x 1 m
<b>Tōtara*</b> <i>Podocarpus totara</i>	Tree	   	  	20 x 4 m

\* Plant these species into existing vegetation or 2-3 years after initial plantings so they have shelter to grow.



“We want to keep our soil on the hills and the farm. That’s better for the waterways, and better for us.”

– Sefton Alexander,  
Federated Farmers Executive Member  
& Wairoa Representative

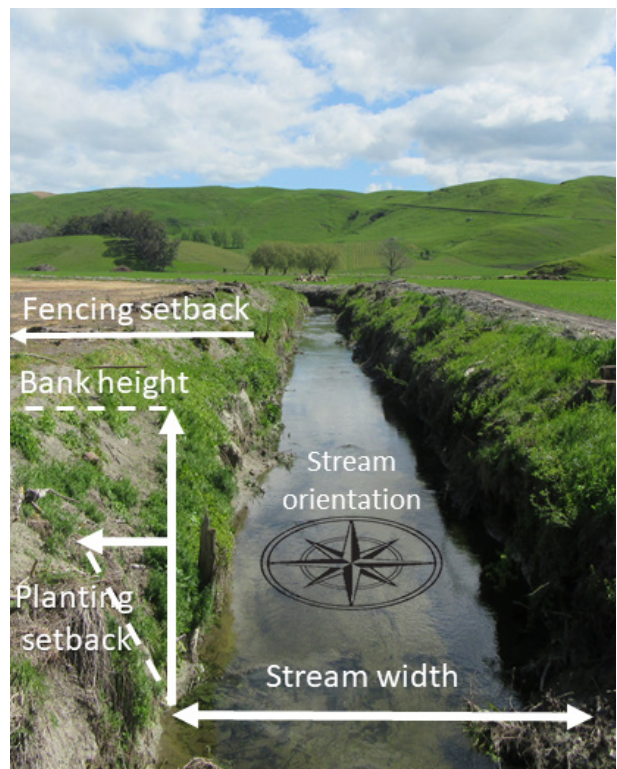
## Shade

### A huge benefit of riparian planting is the shading of streams.

The East Coast region has long, hot, sunny summers which encourage aquatic weed growth and increase water temperature.

Studies confirm that pastoral streams with more than 70% canopy shading have significantly less nuisance aquatic plants and water temperatures below levels that stress sensitive species.

In small streams, shading by banks can be significant and can be increased by planting grasses, shrubs and flaxes. The height of plants for shade includes the bank height above water level. For example, a 1m high bank with 1m tall vegetation has a “plant height” of 2m.



## DID YOU KNOW?

Good shading can be achieved on any stream as long as the stream width and plant height match.

Good shading can be achieved on any stream as long as the stream width and plant height match. Because trees and shrubs are often planted a short distance from the water's edge, add the setback of plants to the stream width to estimate the plant height for sufficient shade. The trees have to be as high as the distance between them on the opposite bank.

Plant trees on the stream bank close to each other, so that gaps in the canopy eventually close. If you invest in more plants and plant them densely, less maintenance is needed as weeds are shaded out sooner.

## Plant both banks

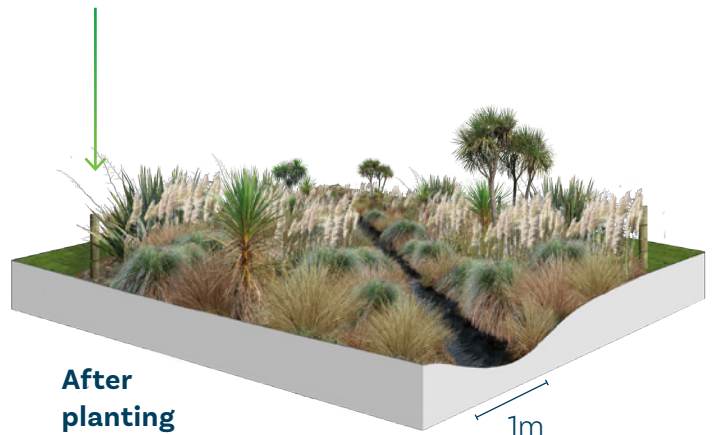
Planting just one bank risks leaving the stream unshaded in either the morning or afternoon, and the shade may fall short of the 70% target.

In some situations, for example if sediment from upstream keeps accumulating in very low-gradient streams, it may be necessary to plant lower plants on one side to maintain your stream access.

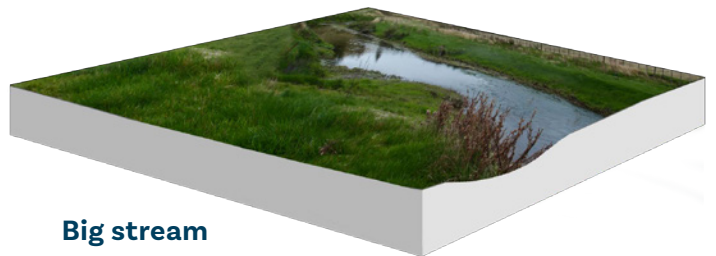
Because tree heights in riparian zones rarely exceed 25 m, it's not feasible to achieve 70% average shade for rivers wider than 10 m by planting one bank, nor rivers wider than 15-20 m by planting both banks. However, planting trees and other vegetation along will still improve stream health.



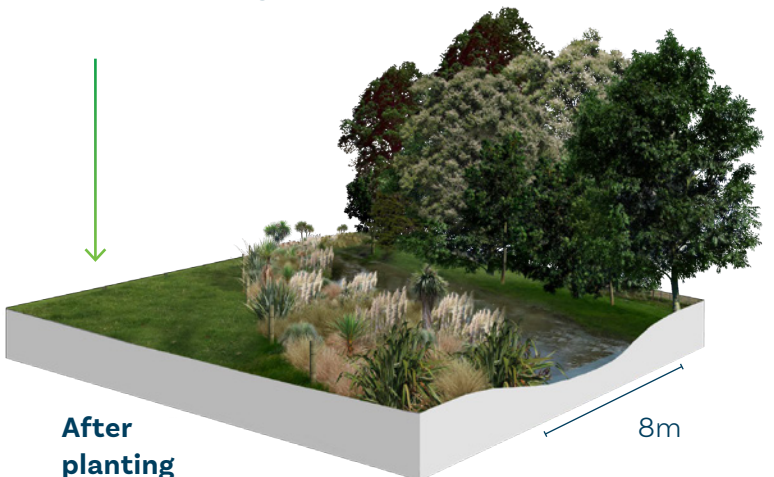
Small stream  
before planting



After  
planting



Big stream  
before planting



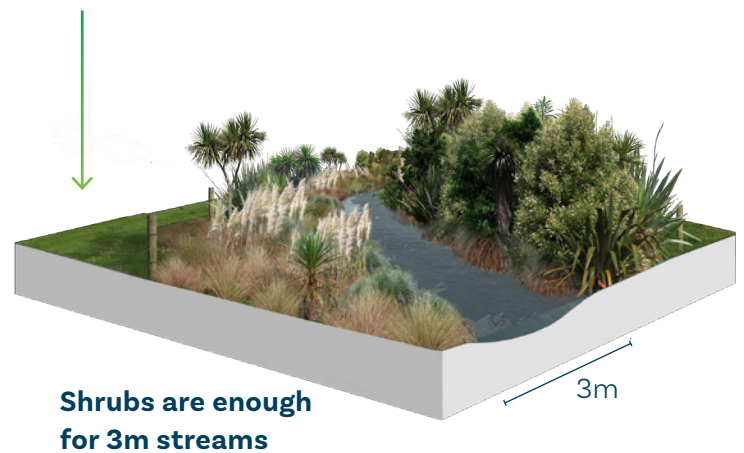
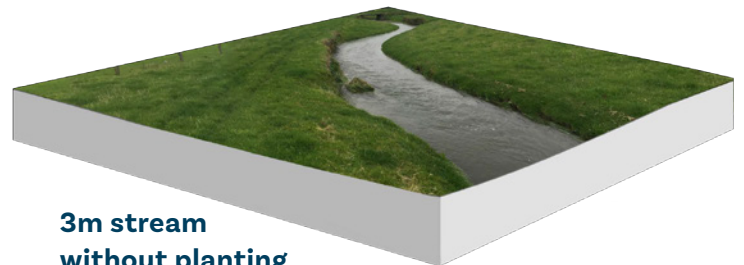
After  
planting

## TIP

A good rule of thumb: For 70% shade, plants need to be as high as the stream is wide.

## North-South streams

People often think that planting a North-South flowing stream is a waste of time because plantings won't block the midday sun. The sun is only directly north for a short time each day, and for most of the day plantings on the east and west banks create excellent shading.



## TIP Shading for different stream orientations:

### Both banks planted:

#### North-South flowing stream

Plant height needs to be at least 80% of the stream width.

#### East-West flowing stream

Plant height needs to be at least 150% stream width.

#### Meandering stream

Plant height needs to be at least 75% stream width.

### One bank planted:

#### North-South flowing stream

One bank planted North-South does not achieve 70% shade for aquatic weed control, but is likely to slow aquatic weed growth, improve temperature and water quality.

#### East-West flowing stream

Plant height = 3x stream width and overhanging canopy.

Taller vegetation on the North bank.

#### To create more shade

Have taller plants, plants overhanging the channel, and/or meandering channels.

# Maintenance

## Combining protective and active maintenance methods is recommended as the most effective maintenance option.

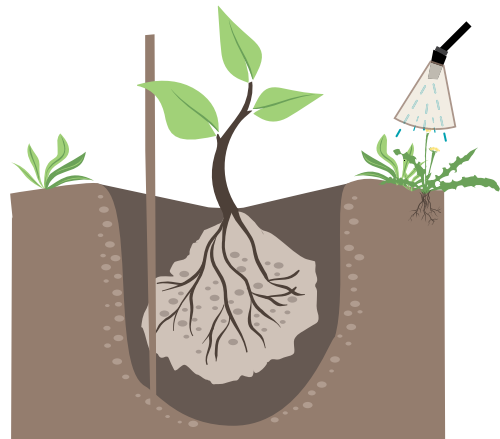
### Protective maintenance

This is less labour intensive but comes at a greater initial cost. Surround each plant with at least a 30-40cm diameter of biodegradable mat that suppresses weed growth. You can use mulch, biodegradable weed mat (not plastic), or old woollen carpet. Wood chip or sawdust from the calf shed can be used as mulch as it has added nutrients from the manure. Avoid using plain wood chip around the plant as it will strip all the nitrogen out of the soil causing the plant to yellow off and possibly die.



### Active maintenance

This can be labour intensive but has a lower initial cost. Each plant should be staked for easy location and brush cut, hand weeded, or carefully sprayed around with a glyphosate-based herbicide, twice a year. If you choose to spray, follow product guidelines; desired plants are usually highly sensitive to herbicides so extreme caution must be taken to protect against spray drift or accidental spray.



### TIP

Grass strips are great at filtering runoff. Avoid the temptation to let livestock graze your margins, even if it is just rank grass. If you need to, brush cut your grass filter strips – don't spray them.

## Common Weeds

Keeping on top of weeds and pests is crucial in the first five years for a healthy riparian zone to become established.



**Blackberry**  
*Rubus fruticosus*



**Morning-glory**  
*Convolvulus arvensis*



**Crack Willow**  
*Salix fragilis*



**Old Man's Beard**  
*Clematis vitalba*



**Broom**  
*Cytisus scoparius*



**Pampas Grass**  
*Cortaderia selloana*

### TIP

Pests such as hares, rabbits, possums and deer will eat your plants. Contact your Hawke's Bay Regional Council animal pest officer for info regarding animal pest control on 06 835 9200 or visit [hbrc.govt.nz/publications-resources](http://hbrc.govt.nz/publications-resources).





# Protecting our valuable water resource is important for New Zealand.

For more information please call Hawke's Bay Regional Council:

Northern Office (Wairoa) (06) 838 8527

Central Office (Napier) (06) 845 9210

Southern Office (Waipawa) 0800 108 838

Te whakapakari  
tahi i tō tātau  
**taiao.**

-----

Enhancing our  
**environment**  
together.