Getting riparian planting right in the Bay of Plenty

Your step-by-step guide for successful riparian planting

Protecting our valuable water resource is important for dairying in New Zealand. It also benefits the community who use water for drinking and economic, recreational, aesthetic, ecological and cultural activities.

Riparian zones can be used to maintain and improve water quality. Once fenced and planted, they filter nutrients, sediment and bacteria that leave the land as runoff. Healthy riparian zones will improve the health of your waterway.

This practical 'how to' guide for riparian management covers planting and maintaining riparian zones for a sustainable and profitable dairy farm. It includes advice from industry and regional council experts.

What are riparian zones?

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, seeps and gullies.

DairyNZ

How to successfully manage your riparian zones

Have a plan to succeed

Having a plan is the key to getting value for your money and doing it right the first time. Your riparian plan should cover the three steps of fencing, planting and maintaining your riparian zones.

Use your farm knowledge to form your plan

1. To avoid losing plants in floods, determine how your waterway behaves in full flow. This will help you decide where to place fences and what to plant.
2. Identify areas on your farm where runoff or erosion occur most frequently and have the greatest effect on water quality. This includes seeps, springs, gullies, eroding banks, boggy areas and wet soils. These should be part of the fenced area and prioritised for planting.
3. Decide what is manageable. Fencing can be completed reasonably quickly, whereas planting and follow-up maintenance takes longer. Set a realistic timeframe and budget for planting. For example, by planting 25% of the area per year, your riparian zones will be complete in four years.

TIP

For advice on riparian protection and funding call your Bay of Plenty Regional Council land management officer on 0800 884 880.

Set fences back far enough to avoid high flow events. This may be quite different from the low flow height.

First things first – animals out

Livestock trample and graze plants. They also damage banks and defecate in water, adding sediment, nutrients and bacteria which reduce water quality. All waterway fencing needs to be permanent to guarantee stock exclusion.

Map your waterways and create a fencing plan. Work out fence lines and crossing points. Your local Bay of Plenty Regional Council land management officer can help you with this. Call 0800 884 880.

Choosing a fencing setback distance

The aim of the setback is to slow runoff enough to ensure as much bacteria, nutrients and sediment as possible are filtered out before they enter your waterway. A setback distance for a healthy riparian zone should vary on-farm to reflect different soil types, slopes and flow.

A wider setback is needed on steeper paddocks, longer paddocks and heavier soils, because these all generate fast flowing runoff. On flat to undulating land, relatively small zones of 3-5 m are still capable of reducing nutrients, sediment and bacteria entering waterways.

When choosing the setback distance of your fence, keep in mind what you want to achieve by planting the zones. If you want to create shade for your stream to reduce weed growth and keep streams cool, you may need wider zones to allow more space for the trees. If you want to filter nutrients, sediment and bacteria from runoff, then smaller zones (3-5 m) with shrubs and grasses will still be effective.

TIP

Check with Bay of Plenty Regional Council (0800 884 880) to see if you are within a flood control scheme area before you start work.

What to plant and where

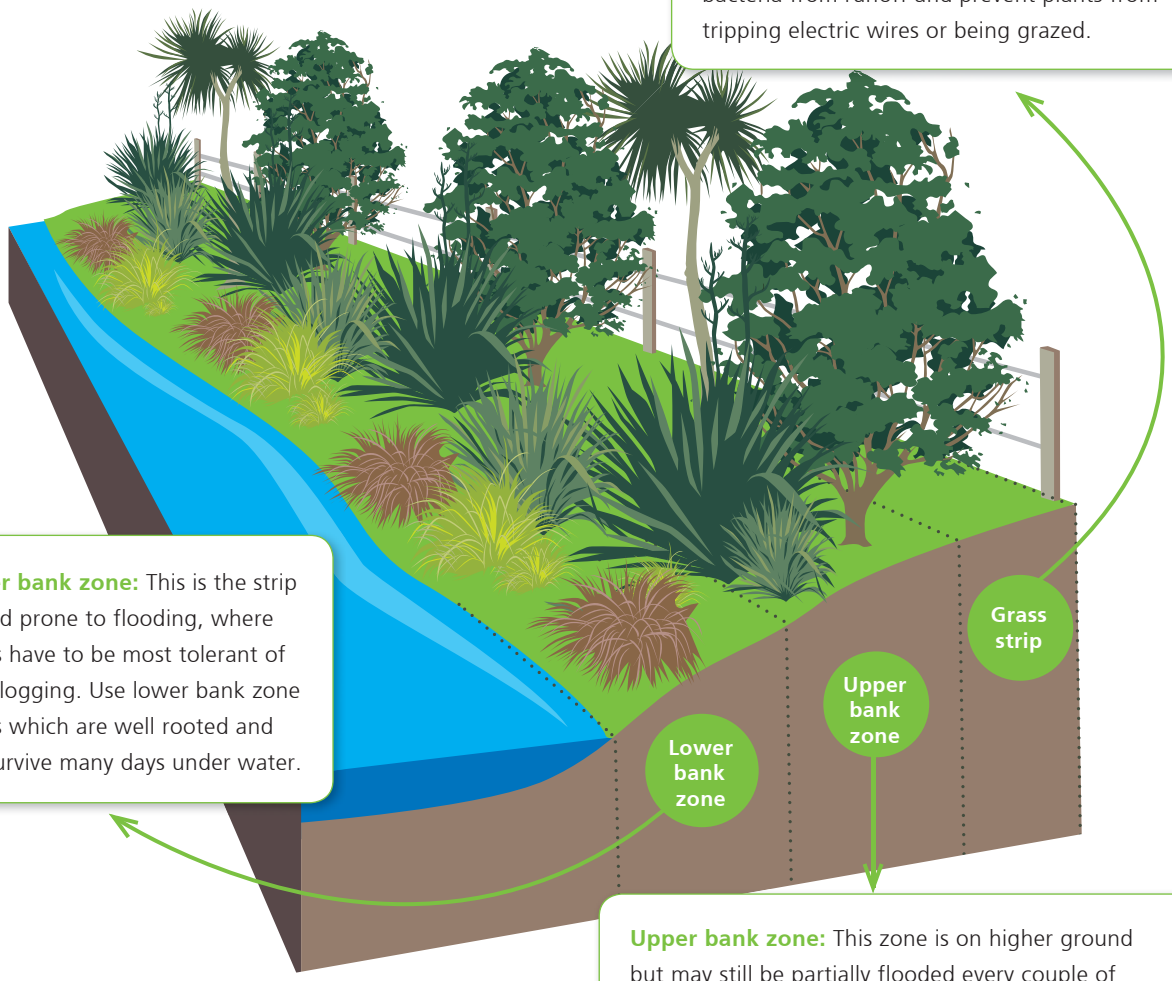
The next step is to decide what to plant, where and at what spacing.

There can be up to three zones of plant types on a healthy riparian zone, as illustrated in the picture below. Planting your upper and lower banks will improve your water quality more than using grass strips alone.

Use the Table of Riparian Plants in this guide to find out which plants are recommended for each zone in the Bay of Plenty region and the correct plant spacings to ensure plants outcompete weeds.

Drains: Maintaining access to drains is important so only plant taller species on one side, preferably the north bank to provide the stream with shade in summer.

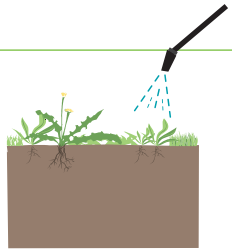
Grass strip: A one-metre wide grass strip should be left around all fences. This will help to filter out sediment, phosphorus and faecal bacteria from runoff and prevent plants from tripping electric wires or being grazed.



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 under water.

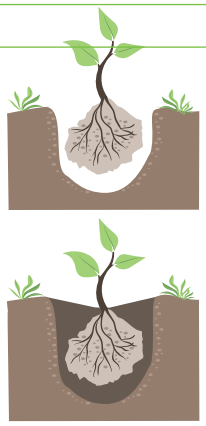
Upper bank zone: This zone is on higher ground but may still be partially flooded every couple of years. Use upper bank zone plants, which tend to be trees and shrubs to provide shade and shelter.

Steps for effective planting technique



1 Remove any grass or weeds.

- Four to six weeks before planting, spray 1 m diameter circles with a glyphosate-based herbicide at the location where you will plant each plant. Check product information to ensure the herbicide is applied correctly.

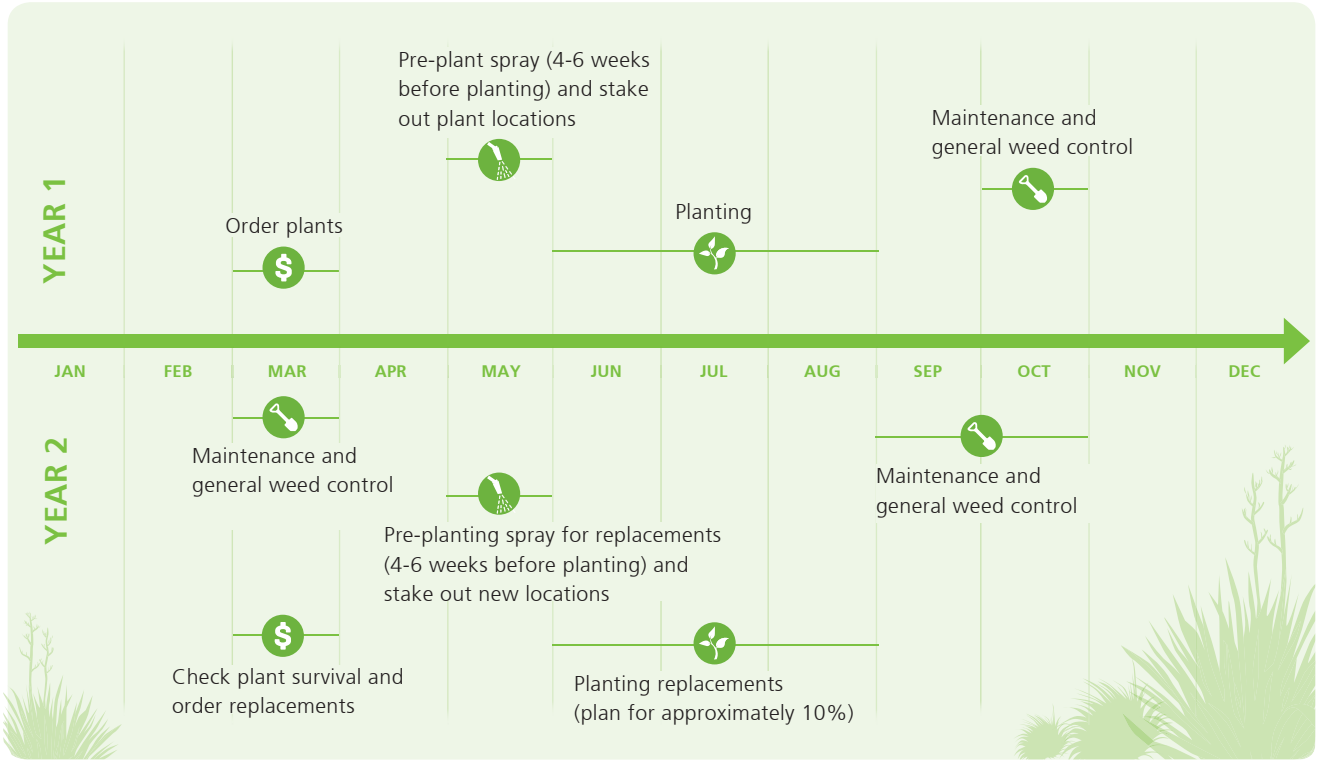


2 Put the plant in a hole that is big enough to accommodate plant roots without them being curled up or bent at the bottom or sides of the hole.

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

3 Put a stake beside your plants so you can 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).

Riparian planting calendar – two year plan

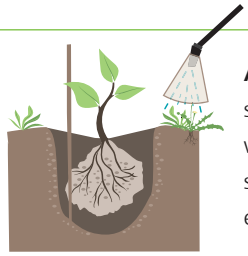


Holding the line: maintenance

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

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 30-40 cm 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, ideally in October and March. 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 do a great job 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.

TIP

Pests such as rabbits, hares, possums and deer will eat your plants. Contact your Bay of Plenty Regional Council biosecurity officer for information regarding animal pest control by calling 0800 884 880.

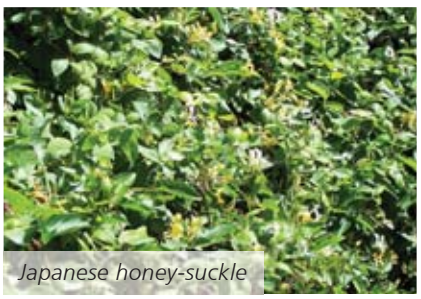
Common weeds to remove in the Bay of Plenty

Blackberry

Kahili ginger

Gorse

Photo courtesy of Waikato Regional Council



Japanese honey-suckle

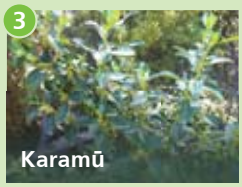
Barberry

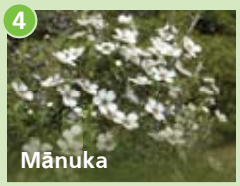
Photo courtesy of Weedbusters

Woolly nightshade

Find out more about plant and animal pests in the Bay of Plenty at boprc.govt.nz/pestmanagement.

FAST 5 PLANTS FOR BAY OF PLENTY





These five go-to plants are ideal to start your planting with – they are hardy, fast-growing, can be planted straight into pasture and don't require shelter. Ask your nursery for eco-sourced plants as they are grown from local wild seed and are best adapted to your climate and soils.

Table of Riparian Plants

Tolerates key: Full sun, Wind, Salt wind, Frost hardy, Poorly drained soil (boggy), Dry soil conditions

Benefits key: Attracts birds, Attracts bees, Slope stabilisation, Filters runoff, Shade, Fish habitat

Plant name	Type	Tolerates	Benefits	Size (height x width)
Lower bank zone Space 1-1.5 m between plants				
Cabbage tree (tī kōuka) *Cordyline australis*	Tree			10 x 3 m
Pukio *Carex secta*	Sedge			0.75 x 1 m
Cutty grass (rautahi) *Carex geminata*	Sedge			0.75 x 1 m
Giant umbrella sedge (upokotangata) *Cyperus ustulatus*	Sedge			1 x 1 m
Swamp sedge (pūrei) *Carex virgata*	Sedge			0.75 x 1 m
Summer-flowering toetoe (toetoe) *Austroderia fulvida*	Grass			1.5 x 1.5 m
Upper bank zone Space 1.5-2 m between plants				
Karamū *Coprosma robusta*	Shrub/small tree			4 x 1.5 m
Mānuka *Leptospermum scoparium*	Small tree			4 x 1.5m
Mountain flax *Phormium cookianum*	Flax			1 x 1 m
Akeake *Dodonaea viscosa*	Small tree			6 x 3 m
Black matipo (kōhūhū) *Pittosporum tenuifolium*	Small tree/tree			8 x 3 m
Kahikatea* *Dacrycarpus dacrydiodes*	Tree			40-60 x 4 m
Kānuka *Kunzea ericoides*	Tree			8 x 3 m
Koromiko *Hebe stricta*	Shrub			1.8 x 1 m
Lemonwood (tarata) *Pittosporum eugenoides*	Tree			9 x 4 m
Mahoe *Melicytus ramiflorus*	Tree			10 x 3 m
Mingimingi *Coprosma propinqua*	Shrub			4 x 1.5 m
Swamp flax (harakeke) *Phormium tenax*	Flax			2 x 2 m
Tōtara* *Podocarpus totara*	Tree			20 x 4 m
Wineberry (makomako) *Aristotelia serrata*	Shrub/tree			8 x 3 m

*Plant these species into existing vegetation or two to three years after initial plantings so they have shelter to grow.

Successful riparian planting in the Bay of Plenty

Karl and Maggy Buhler milk 250 cows on 100 hectares in the Pongakawa Valley. Their farm is bisected by a tributary of the Pongakawa Stream and contains many small spring-fed wetlands. They are passionate about riparian planting and native plants and are involved in several planting projects in the area.

Karl and Maggy started their riparian planting over a decade ago when they fenced and planted a boggy area on the farm to help prevent cows getting stuck. They received advice, funding and a riparian management plan from Bay of Plenty Regional Council which provided them with clear goals in an achievable timeframe.

Karl and Maggy find that by doing the bulk of planting in autumn, plants have a good chance to get their roots down, increasing their survival over summer. Frost-tender plants are planted around September to avoid the coldest weather.

Karl says that controlling the invasive glyceria weed is a major component of their riparian management. "Planting natives that look different to glyceria makes it easier to avoid killing desired plants when spraying," he says. "Glyceria can smother plants but with sheer perseverance it can be removed."

Karl and Maggy have planted around 15,000 plants over the last 12 years, creating a visually stunning property and greatly improving the birdlife which was absent when they bought the farm.

TOP TIPS

Karl and Maggy Buhler

"Get rid of weeds first"

Before you plant, control weeds through spraying or manual removal. In very weedy areas this may take two to three years, but it is much easier than trying to control weeds once plants have gone in.

"Select native plants that are resistant to broadleaf spray"

Planting grass-like species (monocots) like cabbage tree, flax, toetoe, carex species and other native sedges is a great idea where broadleaf weeds occur, as these plants are resistant to broadleaf sprays, making it much easier to control weeds without the risk of damaging plants.

"Don't plant flax too close to the edge of the stream"

Flax is a good riparian plant, but it's large when fully grown and may fall into the stream, taking a chunk of the bank with it. It's best to move flax further away from the stream edge to avoid this happening.

A valuable asset for your farm

When fenced and planted, riparian zones are a valuable asset for dairy farms. They function like a sieve, helping to filter out sediment and nutrients that leave farmland in runoff before they enter waterways. They also provide a valuable habitat for animals, birds, insects and fish.

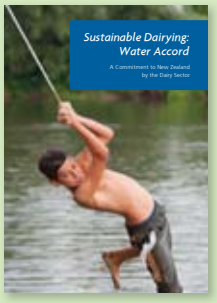
How do healthy riparian zones improve water quality?

- Riparian zones help to reduce sediment into waterways, improving water clarity and the habitat for insects and fish. Less sediment means less cost for drain clearing and less risk of flooding.
- Riparian zones reduce nutrients into waterways, decreasing weed growth, improving biodiversity and water quality, and providing a better environment for swimming and fishing for you and your community.

On your farm, well managed riparian zones will improve stock management and protect them from getting stuck or drowning in waterways. Taller trees will provide shelter from wind, increase shade and reduce heat and wind stress.

Riparian plants stabilise banks with their roots, limiting the loss of your land through erosion.

The Sustainable Dairying: Water Accord (Water Accord) was developed in 2013 by the dairy industry and is a commitment to manage the land in a way that contributes to achieving water quality desired by New Zealanders. Good riparian management is a requirement of the Water Accord.



The Water Accord requires dairy farmers to ensure:

- Stock exclusion from 90% of farm waterways* and drains** greater than 1 m in width and deeper than 30 cm and significant wetlands by 31 May 2014 and 100% by 31 May 2017.
- 50% of dairy farms with waterways* have a riparian planting plan by 31 May 2016 and all by 31 May 2020.
- Of these farms half of their riparian plan committments have been met by 31 May 2020, with full implementation by 2030.

*A water accord waterway is a "lake, spring, river or stream (including streams that have been artificially straightened but excluding drains) that permanently contains water and any significant wetland. This does not include temporary watercourses that flow during or immediately following extreme weather events".

**A water accord drain is an artificially created channel designed to lower the water table and/or reduce surface flood risk and which has permanently flowing water but does not include any modified (e.g. straightened) natural watercourse.

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