Getting riparian planting right in the Top of the South

Your step-by-step guide for successful riparian planting in Tasman, Nelson and Marlborough

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 or seeps, and swales or gullies.

DairyNZ

How to successfully manage your riparian zones

Have a plan to succeed

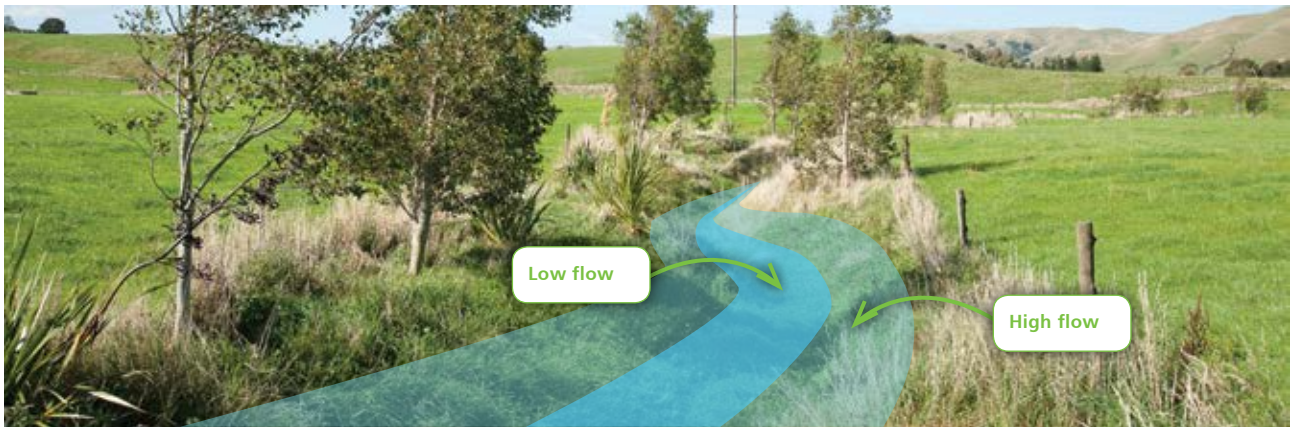
Having a plan is the key to getting value for your money and doing it right the first time. Your riparian plan should cover the three steps of fencing, planting and maintaining your riparian zones.

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

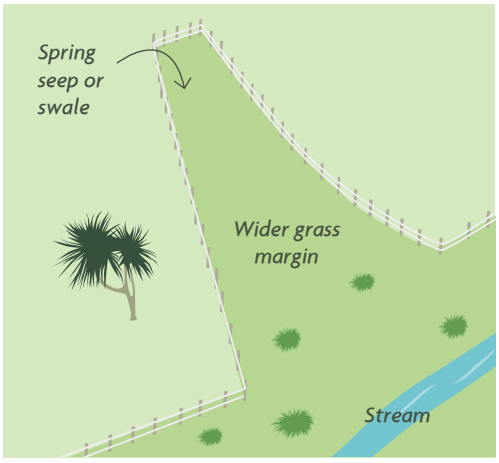
RIPARIAN PLANNER TOOL

This online tool helps you easily create a plan that fits your farm budget. Visit dairynz.co.nz/riparianplanner.



2. Identify areas on your farm where runoff funnels water most frequently or erosion occurs. These areas have the greatest affect on water quality and include seeps, springs, swales, gullies, eroding banks, boggy areas and wet soils. These should be part of the fenced area and prioritised for planting. Bank reconstruction might be needed before 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 percent of the area per year, your riparian zones will be complete in four years.



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. Well constructed permanent fencing will guarantee stock exclusion.

Map your waterways and create a fencing plan. Work out fence lines and crossing points.

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

To improve stream wildlife, plant a range of tall plants that overhang the waterway and provide shade. These plants will "feed the stream" with leaves and insects and provide habitat for fish when branches fall in.

What to plant and where

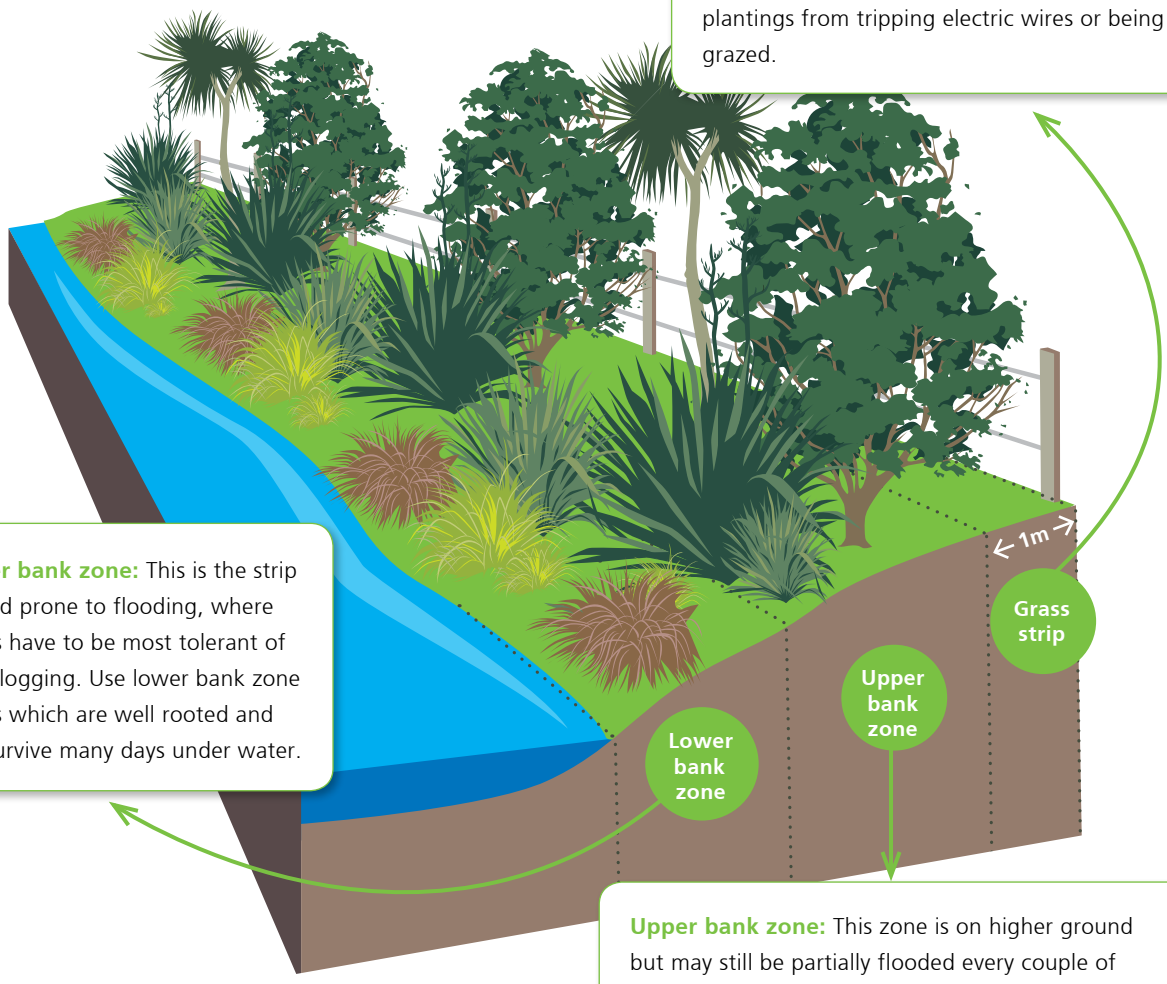
The next step is to decide what to plant, where and at what spacing.

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 Top of the South and the correct plant spacings to ensure plants outcompete weeds.

Drains: Maintaining access to drains is important so plant up one side only, preferably the north bank to provide the stream with shade in summer. Avoid planting deep-rooted species (upper bank plants) over tile drains. For more information visit dairynz.co.nz/drains.

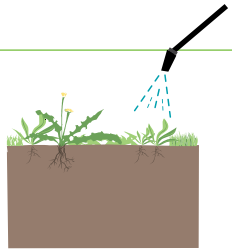
Grass strip: At least a one metre wide grass strip should be left around all fences. This will help to filter out sediment, phosphorus and faecal bacteria from runoff and prevent plantings from tripping electric wires or being grazed.



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.

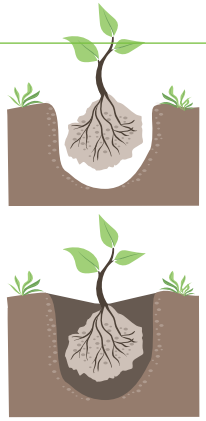
Upper bank zone: This zone is on higher ground but may still be partially flooded every couple of years. Use upper bank zone plants, which tend to be trees and shrubs to provide shade and shelter.

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 does not remain active in the soil or have residual effects that may affect plants.



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.

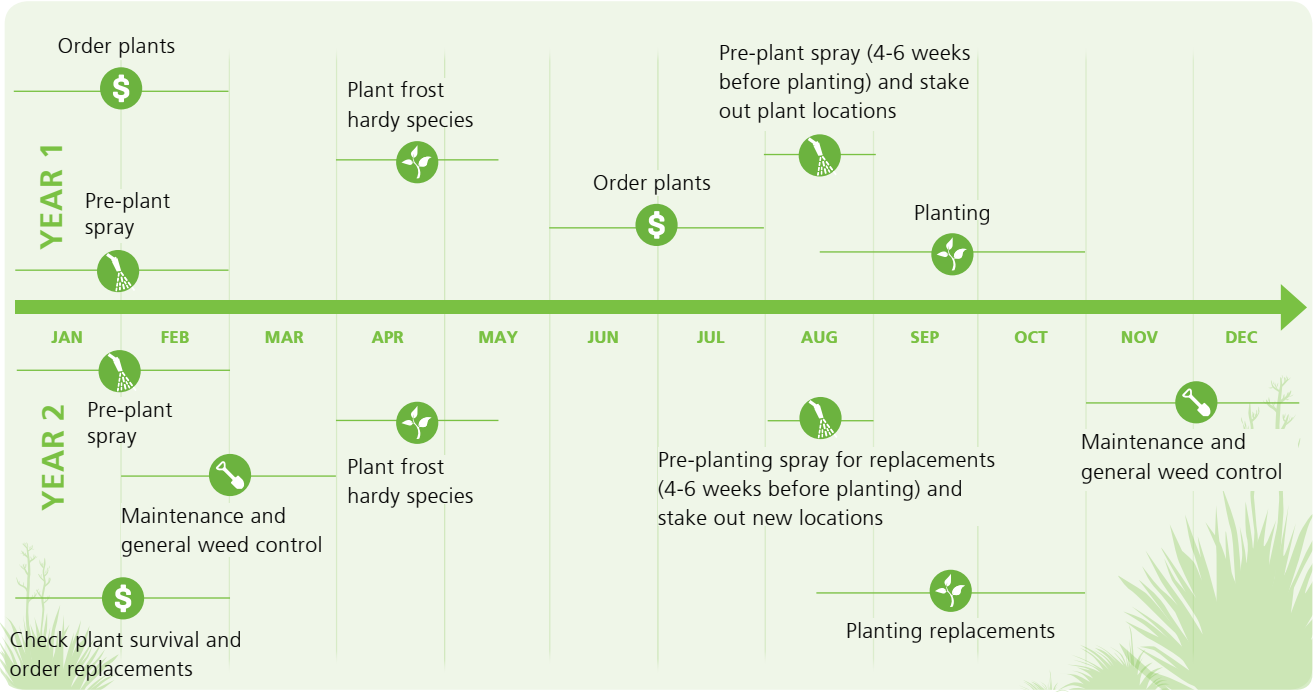
- On drier soils, ensure the base of the stem is 1-2 cm below the surrounding soil surface. Mulch around plants will help keep soils damp, reduce weeds and provide nutrients. Good mulches include straw, staked down cardboard, fine bark chips or wool.
- On permanently wet soils, place the base of the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

TIP

Plant protectors help protect plants from cold wind, maintenance spraying and rabbits and hares.

Riparian planting calendar – two year plan

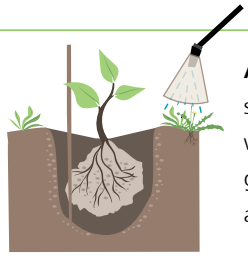


Effective plant maintenance

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. 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 sensitive to herbicides so caution must be taken to protect against spray drift or accidental spray.

TIP

Grass strips do a great job at filtering runoff, particularly in areas that concentrate 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. Weeds can easily smother and kills plants. Contact your local council for information regarding plant and animal pest control.

Common weeds to remove in the top of the South Island

Broom *Photo courtesy of Weedbusters*

Barberry *Photo courtesy of Weedbusters*

Gorse *Photo courtesy of Waikato Regional Council*

Banana passionfruit

Old man's beard *Photo courtesy of Weedbusters*

Blackberry

Find out how to manage weeds at weedbusters.co.nz.

Water babies drive successful riparian planting in Canvastown

The Zillwood family enjoy swimming in the local river and wanted to protect water quality to ensure this could still happen in the future. They started fencing and planting their riparian areas which also helped to stabilise eroding banks. Mark and Simone live in Marlborough's Canvastown with their five children, milking 140 cows on 50ha (effective).

Planting native trees is a task the whole family happily gets involved with and Mark and Simone can see the benefit it will have in improving water quality and providing shelter.

"A lot of school groups and tourists use the local river for swimming, fishing and other activities. We're keen to improve the quality of water flowing downstream and to protect the river for the future," says Mark.

Fencing and planting their streams has almost completely stopped erosion, which was eating into the paddocks and threatening laneways.

"The planted areas now require very little maintenance. After seeing the difference our initial planting made, we've continued to fence and plant the rest of our waterways.

"To keep it manageable, we plant a little bit more of our property each year. We plant hardy species like flax and pittosporum immediately after the fence has gone up to reduce competition from weeds.

"We also ensure that there's at least a one metre gap between the fence and the plants. We use biodegradable weed mat to protect the young plants from getting overtopped by weeds and to trap moisture during dry months."

Weed control maintenance is a key component of their planting project and is carried out two to three times per year over the first three years.

This planting project is visually rewarding for the family and the new trees have brought in the birds. Native plants have stopped erosion and reduced drain maintenance issues. The fencing of all their waterways has improved stock management and they no longer have cows getting stuck in creeks.

TOP TIPS

"Dividing up large flaxes saves money."

Large flax plants can be divided up into smaller plants. They are pulled apart and all but two to three leaves are cut right back per division. Keeping the roots wet while the flax sections are out of the ground is important and planting within a few days has given us a 95 percent success rate.

"Select frost-tolerant species."

With over 20 frosts last year, having plants that can take cold conditions is vital. Plants like cabbage tree, toetoe, carex, pittosporum and flax work well in this area and are tolerant of frost.

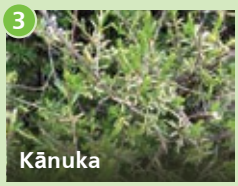
"Don't plant to close to the fence."

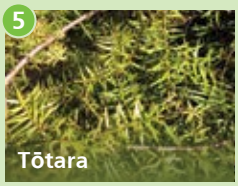
Keep in mind, particularly when using large plants like flax and toetoe that they can grow up to two metres sideways. Planting too close will mean they push through and short out electric fences.

"Take the time to look after your plants."

Planting takes time and money, so it's worth looking after your investment and spending time controlling weeds as plants get established. We found that regular weed control – doing a little bit often – is far easier than waiting until the weeds are large and problematic to work around.

FAST 5 PLANTS FOR THE TOP OF THE SOUTH ISLAND





These 5 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 that are hardiest.

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				
Pukio *Carex secta*	Sedge			0.75 x 1 m
Purei *Carex virgata*	Sedge			1.5 x 1.5 m
Rautahi *Carex geminata*	Sedge			1.5 x 1 m
South Island toetoe *Austroderia richardii*	Grass			2 x 1.5 m
Upper bank zone Space 1.5-2 m between plants				
Cabbage tree (tī kouka) *Cordyline australis*	Small tree			10 x 3 m
Kānuka *Kunzea ericoides*	Tree			12 x 3 m
Lemonwood (tarata) *Pittosporum eugenioides*	Small tree			12 x 3 m
Tōtara *Podocarpus totara*	Tree			20 x 4 m
Coastal flax (wharariki) *Phormium cookianum*	Other monocot			2 x 1.5 m
Kahikatea *Dacrycarpus dacrydioides*	Tree			40-60 x 5 m
Kaikōmako *Pennantia corymbosa*	Small tree			11 x 3 m
Kōhūhū *Pittosporum tenuifolium*	Small tree			9 x 2 m
Kowhai *Sophora microphylla*	Small tree			7 x 3 m
Lowland ribbonwood (manatū) *Plagianthus regius*	Tree			12 x 3 m
Mānuka *Leptospermum scoparium*	Small tree			4 x 1.5 m
Marbleleaf (putaputāwētā *Carpodetus serratus*	Small tree			10 x 3 m
Matai *Prumnopitys taxifolia*	Tree			20 x 5 m
Narrow-leaved lacebark *Hoheria angustifolia*	Tree			10 x 3 m
Swamp flax (harakeke) *Phormium tenax*	Other monocot			2 x 2 m
Whiteywood (māhoe) *Melicytus ramiflorus*	Small tree			8 x 2 m

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

To learn more about native planting and biodiversity visit tasman.govt.nz/go-wild.

A valuable asset for your farm

When fenced and planted, riparian zones are a valuable asset for your dairy farm. They function like a sieve, helping to filter out sediment and nutrients that leave farmland in runoff before they enter waterways and provide valuable habitats for animals.

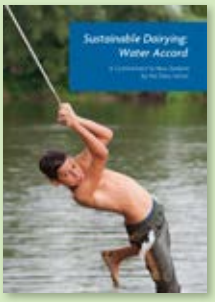
How do healthy riparian zones improve water quality?

- 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 protect stock from getting stuck or drowning in waterways, provide more shade, reduce heat-stress and make it easier to manage stock.

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.

Your council can help

Your local council can provide advice on:

- Planting and fencing of streams and wetlands
- Erosion control
- Rules and consent requirements
- Weed and animal pest control

Tasman District Council
03 543 8400

Marlborough District Council
03 520 7400

Nelson City Council
03 546 0200

tasman lifestyle district council

Nelson City Council te kaunihera o whakatū

MARLBOROUGH DISTRICT COUNCIL

DNZ40-069 October 2015