

Waterway Technote

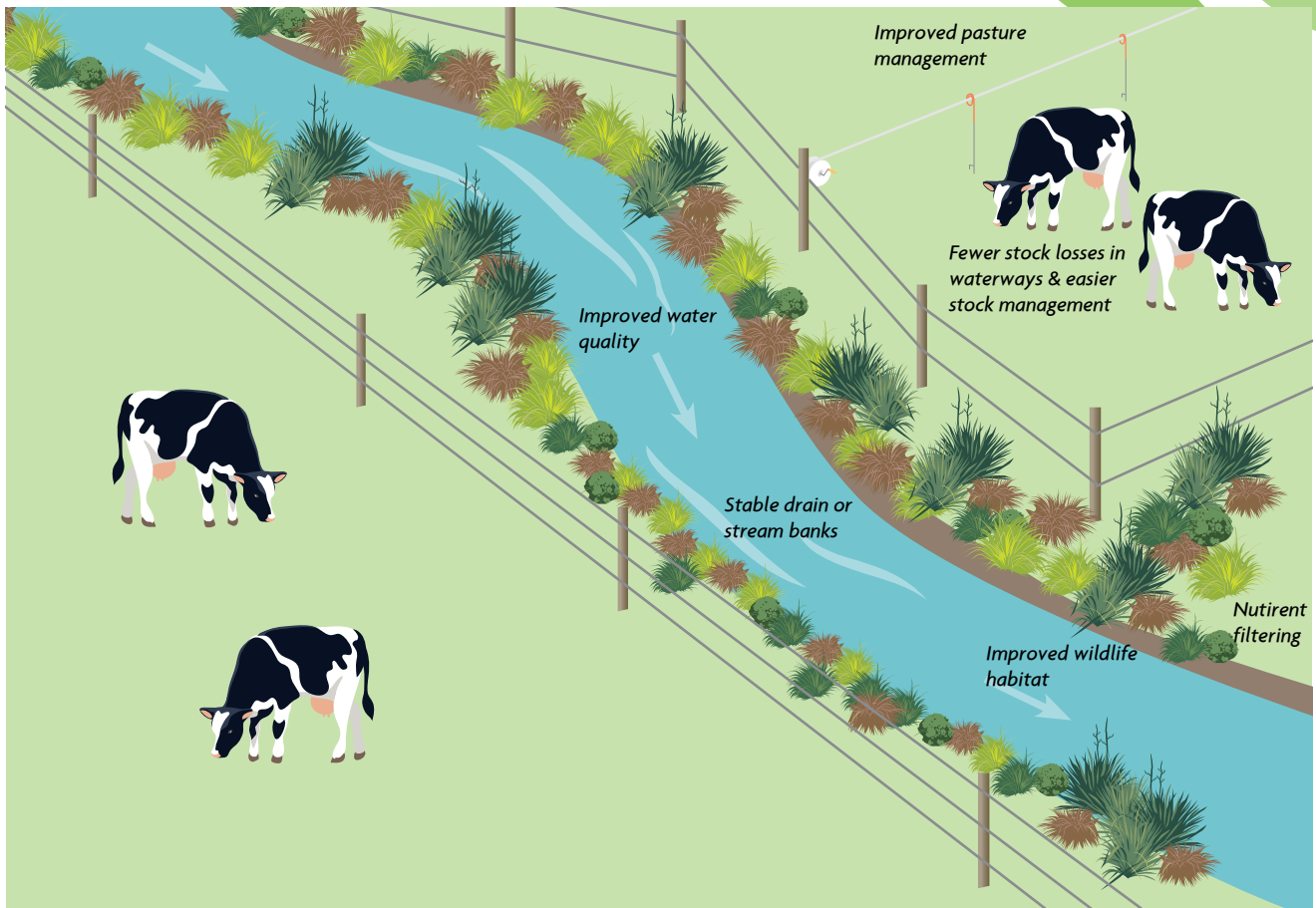
Fencing

Contents

| | |
|--|----------|
| Benefits of fencing waterways | 1 |
| Key messages/quick links | 2 |
| Planning | 3 |
| How to determine where your fence should go | 3 |
| What is your waterway like? | 5 |
| Surrounded by rolling land/flat land | 5 |
| Surrounded by steep land | 5 |
| Erosion prone banks | 5 |
| Surrounded by poorly drained soils | 6 |
| Surrounded by free draining soils | 6 |
| Weed management | 6 |
| Type of fence | 6 |
| Requirements | 6 |
| Funding | 6 |
| Fencing in flood prone areas | 6 |
| Maintaining access | 8 |
| Where to go for more information and help | 9 |
| References | 9 |

Benefits of fencing waterways

Fencing waterway margins is an important step in protecting freshwater from nutrients, faecal matter and sediment. It creates a buffer between water and the land. Fencing riparian zones will create a habitat for birds and freshwater species and will also help maintain and improve water quality.



Key messages/quick links

- Plan what you want to do before fencing.
- Fence back far enough to allow for movement of the waterway.
- Consider farm layout when putting new waterway fences up.
- Plan where crossings will go.
- Once fenced, the riparian area will probably need some management. You may require weed or pest animal control.

Under the Sustainable Dairying Water Accord:

- All stock must be excluded from any permanently flowing rivers, streams, drains and springs, more than a metre wide and 30cm deep by May 2017
- All lakes must have all stock permanently excluded by May 2017
- Any significant wetlands, as identified in your regional plan or policy statement must also have stock permanently excluded by May 2017. Check with your dairy company to see if you have one on your property.

This means that the fencing of waterways should be a priority on your farm.

See the *Sustainable Dairying Water Accord* at: dairynz.co.nz/wateraccord.

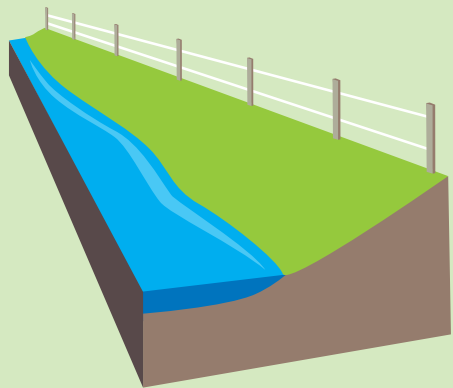
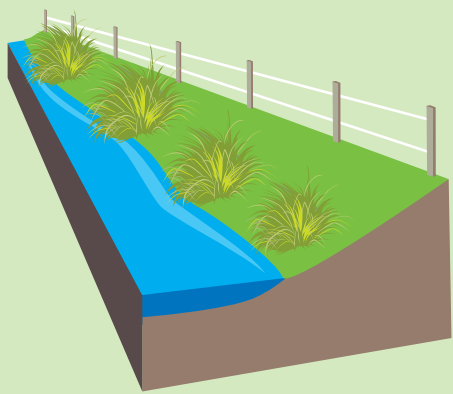
Planning

Consider the overall layout of your farm when planning for waterway fences. Along with protecting waterways, new fencing could improve grazing management and stock control¹.

The setback for your fence will depend on how you are going to manage the area between the fence and the stream. Do you want to maintain it as a grassy strip to filter nutrients and sediment from runoff or do you want to plant it with trees?

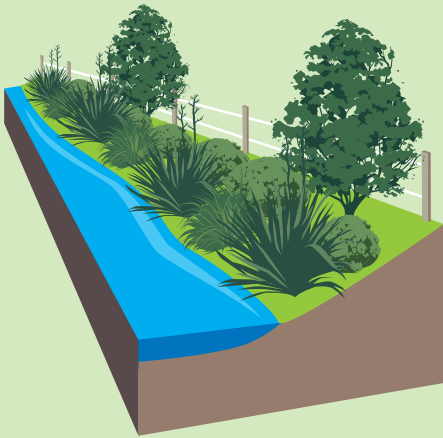
How to determine where your fence should go

Where you locate your fence will depend on how you intend on managing the zone. There are four major ways to manage your riparian zones:²

| | |
|--|--|
| <p>1 Fence/keep stock out of streams (grass filter strip)</p>  | <p>Benefits</p> <ul style="list-style-type: none">• Reduce phosphorous and sediment from entering the waterway• Cheapest option• Small loss of grazing land• More stable banks• Excludes stock and their direct faecal inputs and treading damage. <p>Limitations</p> <ul style="list-style-type: none">• Needs weed control• Limited shading of waterway• Minimal habitat for bird and aquatic life• Banks can become unstable without deeper rooted vegetation. |
| <p>2 Low planting – plant low growing sedge species and fence</p>  | <p>Benefits</p> <ul style="list-style-type: none">• Stock exclusion• Stream bank stability• Reduce phosphorous and sediment from entering the waterway• Only small loss of grazing land• Helps control weed growth• Shade and cover for fish and insect life• Can make use of sprays targeted to broadleaf species. <p>Limitations</p> <ul style="list-style-type: none">• Needs weed control• Minimal habitat for birdlife. |

¹ Dairy NZ. Fencing factsheet.

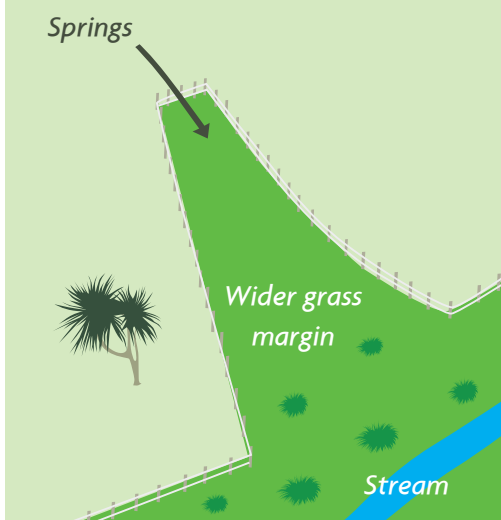
² DairyNZ: Riparian Planner – Understanding and managing your riparian margins

3**Full planting - fence and plant the riparian margin****Benefits**

- Reduced drain maintenance
- Attractive asset for your farm
- Provides shade and keeps water cool for fish, etc
- Increased habitat for birds
- Reduce phosphorous and sediment from entering the waterway
- Some nitrogen removed by plants
- Improves stream bank stability.

Limitations

- Can be expensive
- May result in loss of grazing land
- Needs weed control for at least two to three years
- Animal pest control may be required.

4**Fence stock out of seeps/wetlands/swamps and springs****Benefits**

- Reduces stock losses
- Reduces faecal bacteria in water
- Filters out nutrient and sediment from runoff
- Reduce phosphorous entering the waterway
- May provide habitat for bird life
- Denitrifies water before entering the stream.

Limitations

- May result in loss of grazing land
- Needs weed control
- May be expensive if planting is required
- May affect stock flow or cause campsites.

See *Waterway Technote: Planting* for information on planting options.

What is your waterway like?

Surrounded by rolling land/ flat land

Fence set back needs to allow for a grass margin and changes in stream shape and size.

If you are planting natives you will need a margin of five metres, this will allow for a one metre strip of grass and two to three rows of native plants.



An example of the minimum fencing setback on flat land.

Source: Waikato Regional Council



A five metre setback allows for several rows of native plants.

Source: Waikato Regional Council



A wider riparian margin has been provided on the left side of the stream where the slope is rolling.

Sourced from: <http://news.ecocentre.co.nz/posts/streambank-work-goes-mainstream-in-taranaki-so-what-about-north/>

Surrounded by steep land

Steep areas generate fast runoff and the margin required to capture it will be wider than that used for rolling or flat land. Allow for a grass strip on the fence side of the riparian zone. If you are planting natives you will need a margin of five metres, this will allow for a one metre strip of grass and two to three rows of native plants. The larger the riparian zone, the more likely that runoff will be captured before it reaches the stream.

Erosion prone banks

Fences will need to be set back further on erosion prone banks. Allow for some erosion and changes in stream meander, particularly on the outside of bends. Erosion is a natural process and in some areas will be hard to stop or slow without appropriate planting or structures. Your regional council will be able to give you ideas and advice on how to fix it.

Consider how far the stream moves during large storm or erosion events and how many events occur yearly. Vegetation will not protect the stream straight away so fence back far enough to allow for three years of erosion. For more information on erosion management see *Waterway Technote: Erosion*.



A wide riparian margin has been provided as steep slopes feed into the waterway.

Source: <https://www.niwa.co.nz/publications/wa/vol11-no4-december-2003/photo-survey-do-people-like-riparian-management-on-farm-streams>

Surrounded by poorly drained soils

Poorly drained soils require a wide setback. Water does not easily infiltrate the soil resulting in overland flow directly into waterways. Wetlands can be used to remove nutrients and sediment, so try to fence these off also. Dense riparian plantings will slow flow and also act as a filter before runoff enters the waterway. Your setback should allow for several rows of trees and a grassy margin.

Surrounded by free draining soils

Free draining soils will require a riparian area large enough to accommodate deep rooted plants. In well-drained soils water will easily move through the soil into groundwater and then potentially into surface water. Roots of riparian plants help to filter this, removing nutrients and other contaminants. Plants with strong roots will also help to stabilise banks and prevent erosion.

Weed management

Weed growth can be a problem in fenced grass margins if not managed early on. For information on identifying and controlling specific types of weeds see *Waterway Technote: Pests*.

Type of fence

Investment in a robust, stock proof, good quality fence provides the best waterway protection and minimises maintenance issues long term. Ensure your fence is suitable for all classes of stock that will be near waterways.

Requirements

Different milk suppliers have different minimum requirements around fencing so it is best to check with your milk supplier before finalising your choice of fence.

Waterways that are required to be fenced due to a resource consent condition may have specific fencing requirements and fence setbacks. Ensure you comply with any regional council requirements.

Funding

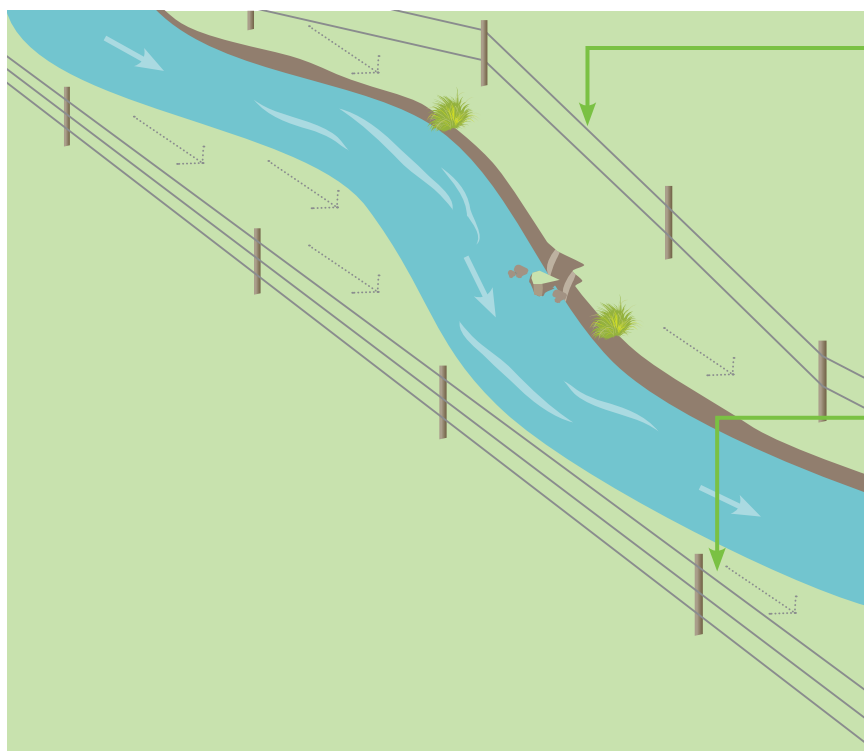
Funding may be available from regional councils or QEII Trust. Usually it is for fencing above the minimum standard, for example fencing an environmentally significant waterway or wetland. In these circumstances, specific fencing standards may apply.

For further information on fencing design and what materials to use see openspace.org.nz.

Fencing in flood prone areas

These areas may need a wider set back than other areas, to ensure that the fence is not subjected to high velocity flows. Where possible erect fences above any flood prone areas or leave a good setback from the waterway. This is particularly important on the outside of bends of rivers and streams where there is greatest potential for banks to break and erosion to occur. Think about what the stream does in regular high flow events before fencing.

Use techniques outlined below to help reduce the impact of flooding on your fence.



Option 1 Fence with the stream shape, but ensure that other measures listed are taken into account. Have as few wires as possible while still stock proof and keep bottom wire high to allow debris to flow underneath.

Option 2 Fence with the flood direction, this will help reduce flow against the fence and debris getting caught on the fence. You may have to fence further back to allow for meanders in the stream. This is a good option where you require more wires or battens on the fence.

When fencing flood prone areas:

- Use fewer uprights and less wire – this way less debris will catch on the fence. Do not use netting as it will trap debris³
- Put wires on the downstream side of posts so the staples pop and the wire drops rather than pulling out the posts and strainers¹
- Use un-barbed staples so wires can pop off more easily¹
- Erect fences parallel with the way the stream floods so the fence does not collect debris¹
- Have fences further back where active erosion is occurring
- Construct separate 'blow-out' sections across flood channels.⁴

You should also consider:

- Avoid using battens in flood prone sections to reduce snagging²
- Use insulators that can be dropped before a flood event
- Another option could be to use tape instead of wire as it's easy to repair after a flood has gone through
- If flow levels are usually low, think about where the bottom wire is in relation to the flood levels and move it slightly higher.²

³ Environment Canterbury: Living Streams Handbook – Part 2: Improving the stream environment. Environment Canterbury. Christchurch.

⁴ Waikato Regional Council, 2004: Clean Streams: A Guide to Managing Waterways on Waikato Farms. Waikato Regional Council. Hamilton.

Maintaining access

If you need to maintain access for machinery to clean weeds, silt or debris from your waterway consider these options:

- Check that you do not require regional council consent
- Build an electric fence that can be dropped or removed to allow access.
- Use pinlock insulators so that the wires can easily be lowered for machinery to cross
- Position the fence so that a long reach digger can reach over the top
- For wide waterways, place a fence far enough back to allow a digger to work between the fence and the bank. This approach still allows for a wide grassy margin and you can plant low growing plants on the waterway margin if you wish. Do not cut off gateways that give diggers access to neighbouring paddocks.⁵



Pinlock insulator.

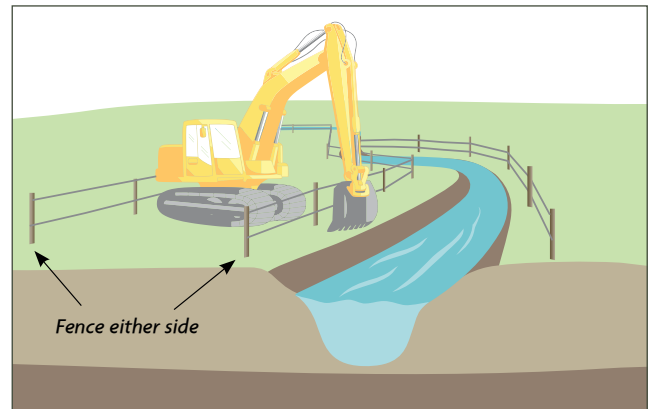
Source: <http://intelligentfencing.com/shop/category.php>

For information on what can be planted along drains where access is required see *Waterway Technotes: Drains*.



Fence positioning which allows a long digger to reach over the top.

Source: Environment Canterbury. *A Guide to Managing Waterways on Canterbury Farms*. Environment Canterbury. Christchurch.



Example of a wide riparian strip that allows for digger access.

Source: Environment Canterbury: *Living Streams Handbook – Part 2: Improving the stream environment*. Environment Canterbury. Christchurch.

⁵ Environment Canterbury. *A Guide to Managing Waterways on Canterbury Farms*. Environment Canterbury. Christchurch.

Where to go for more information and help

| Agency/organisation/company | Type of advice |
|---|---|
| <i>Regional councils</i> | Riparian fencing |
| Northland – land management officer - 0800 002 004 | Pest plants and pest animals |
| Auckland – land and soil advisor - (09) 301 0101 | Planting advice |
| Bay of Plenty – land management officer - 0800 884 880 | Possible funding assistance |
| Waikato – land management officer - 0800 800 401 | Helpful publications |
| Taranaki – land management officer - 06 765 7127 | |
| Hawkes Bay – land management advisor – 06 835 9200 | |
| Gisborne – 06 867 2049 | |
| Horizons/Manawatu – 0508 800 800 | |
| Greater Wellington – 0800 496 734 | |
| Marlborough – 03 520 7400 | |
| Tasman – 03 543 8400 | |
| Nelson --03 546 0200 | |
| Canterbury – 0800 324 636 | |
| Otago – 0800 474 082 | |
| Southland – 0800 76 88 45 | |
| West Coast – 0508 800 118 | |
| DairyNZ | Helpful publications: dairynz.co.nz Riparian planning Fencing advice |
| Your local rural supply store | Fencing advice Fence costs |
| Fencing contractors | Fencing advice Fence costs |

References

Collier KJ, Cooper AB, Davies-Colley RJ, Rutherford JC, Smith CM and Williamson RB, 1995: Managing riparian zones: A contribution to protecting New Zealand's rivers and streams (2 volumes). Department of Conservation, Wellington.

DairyNZ: Farmfact sheet – Fencing.

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Environment Canterbury. A Guide to Managing Waterways on Canterbury Farms. Environment Canterbury. Christchurch.

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Parkyn SM, Shaw W and Eades P, 2000: Review of information on riparian buffer widths necessary to support sustainable vegetation and meet aquatic functions. NIWA Client Report ARC00262.

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