



# WATER QUALITY MANAGING POLLUTANTS





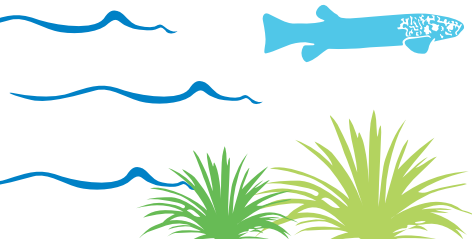
Freshwater is important to all New Zealanders, and landowners have an important role to play in ensuring that activities undertaken on the land, do not have a negative impact on downstream rivers, wetlands, and seas.

Managing nutrients and pathogens by preventing these from entering water from land, supports both human and aquatic health.

## ***HOW TO ASSESS THE HEALTH OF YOUR STREAM***

To check whether your stream is in good health, look for:

- Low levels of fine sediment (you can assess this by shuffling your feet in the stream or by assessing how much of the stream bed contains sediment).
- A bank that does not have visible erosion.
- Plenty of habitat for macro-invertebrates and fish.
- Shade – especially on the northern side – with vegetation offering good diversity with a sizeable riparian buffer strip.
- A water course with pools, riffles, and meanders – fish like a range of conditions.



There are two types of discharges to water from land which need to be managed:

- **Point source discharges** refer to contaminants that enter waterways from a direct source such as a septic tank or a milking shed.
- **Non-point source discharges** refer to contaminants that enter waterways from a variety of sources cumulatively, most commonly pasture runoff.



## **CRITICAL SOURCE AREAS (CSA)**

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A critical source area, or CSA, refers to the small and low lying areas on your land, such as a gully, where runoff gathers. When carried to waterways, this runoff takes with it sediment and nutrients that can enter waterways.

Intercepting contaminants before they enter waterways is key to improved water quality.

- Walk the farm and identify critical source areas and point sources where faeces, nutrients and sediment can enter the waterways. This might include septic tanks, rubbish pits, stock yards, water troughs, chicken coops, pig pens, offal holes, or stock camps, low lying areas where water pools and travels during wet weather.
- Prevent leaching of water from these areas by directing runoff into wetlands or paddocks through the use of cut-offs.
- Plant riparian buffers to filter runoff. Grass will act as a filter, although a planted margin will offer enhanced and additional benefits such as reducing water temperature through shade and creating habitat for birds and for fish.





## ***WHAT ARE THE BENEFITS OF MANAGING CSAS?***

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By managing critical source areas landowners can:

- Reduce the loss of valuable topsoil.
- Reduce the level of nutrients and sediment entering waterways.
- Keep animals out of CSAs which can improve hoof health and reduce the incidence of mastitis.



# BEST MANAGEMENT PRACTICES FOR REDUCING CONTAMINATION OF WATERWAYS

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- Avoid break-feeding stock close to waterways, especially in wet weather.
- Fence off streams, rivers, swamps, wetlands and seeps to prevent stock access.
- Plant the banks of waterways with a selection of native plants to help stabilise the bank and trap nutrients.
- Fence and retire wetland areas and ponds. They act as filters and help denitrify excess nitrogen leaving the farm.
- Maintain fences around waterways with a margin between the waterways/ drains and the paddock. Control weeds, including willow regrowth, along the stream margins.
- Design and maintain tracks and races to direct run off onto grassed areas.
- Use bridges or culverts for stream crossings.
- Leave a buffer zone between streams and cultivated areas.
- In winter, break feed towards a waterway rather than away from it.

## And if you irrigate using effluent:

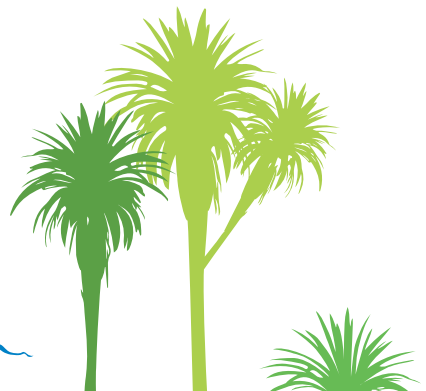
- Move effluent irrigators frequently to prevent ponding of effluent and run off into waterways.
- Provide effluent storage so that dairy shed effluent can be applied at optimal times.
- Maintain a safe distance between waterways and effluent system.
- Avoid irrigating effluent over subsurface drained land.

For more information on managing Critical Source Areas, go to [dairynz.co.nz/environment/land-management/critical-source-areas](http://dairynz.co.nz/environment/land-management/critical-source-areas).

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## PHOSPHOROUS AND NITROGEN

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Nutrients such as nitrogen and phosphorous are important for growth of plants, including pasture and crops.

If nutrients are applied in too high a concentration, they may enter waterways and this can cause the rapid growth of unwanted plants and algae as the natural balance of the ecosystem has been affected.

Exotic weeds can then take over and once these die and decompose, the available oxygen in water is used up causing the death of fish

and invertebrates which rely on water-borne oxygen.

Being aware of what your soil and land use needs are, and using only the amount of nitrogen and phosphorous that is required at the right time, is important. It is also a waste of money to put fertiliser on land when it is not required or if used ineffectively.

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## SEDIMENT

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Sediment in waterways can very quickly alter eco-system health and have an impact along the entire catchment including into our marine environments.

There are natural causes of sediment, however high rates of sediment are usually the result of human activity and land use.

Sediment is increased when vegetation cover is removed, when stock have access to riparian margins

and trample stream banks, or when there are earthworks happening.

Sediment becomes suspended in water and reduces clarity, is harmful to fish, and can destroy spawning habitats. Pathogens such as *E.Coli* can be carried through sediment.

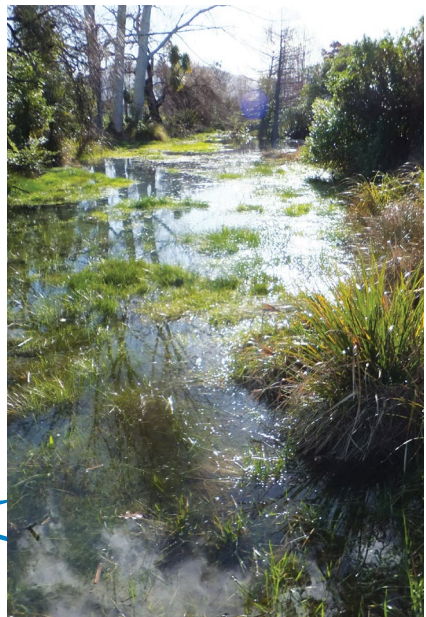
## PATHOGENS

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Faecal matter from animals and from humans contains bacteria that has grown in the gut, some of which can cause serious health problems in humans if they are carried in water used for drinking or for swimming.

This includes giardia, campylobacter, cryptosporidium, and *E.Coli*. These pathogens can be present not only in flowing water, but also in groundwater.

The source of pathogens in rural waterways usually comes from runoff from paddocks which carries faeces from various animals and wildfowl, from stock having direct access into streams where they defecate, or from septic tanks that are not adequately maintained.





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