



WETLANDS

This document is a short overview of wetlands and brings your attention to recommended texts for further reading. Your own council website will have information on wetland preservation.

PROTECTING WETLANDS

Over 90% of New Zealand's wetlands have been drained. Our remaining wetlands should be preserved, nurtured, and enhanced and not drained and we are required not to affect the hydrology of wetlands. Ideally wetlands should comprise between 1-5% of their contributing catchment. But some wetland is better than none! Most of our issues with water quality in our large rivers comes from the smaller waterways associated with over land surface runoff, tile drains, open drains and small streams and it would be great to link these with small filtering wetlands.

There are 3 types of wetlands that capture, over land surface water flow, sub-surface water flow from aquifers and springs and floating wetlands. Over land water flows includes surface runoff, tile drains, open drains or small streams or creeks.

Wetlands provide key habitat for insects, fish and birds and along with riparian planting contribute to biodiversity corridors that link waterways, and stands of native bush, across the landscape. This can be enhanced by predator control. Wetlands are the filters of our waterway system, removing sediment, nutrients and faecal disease causing bacteria.

Councils are required under government directive not to allow the removal or degradation of existing wetlands. Many councils are in the process of, or have mapped, all wetlands in their region and placed many into the protected status of "significant wetland". It is important to find out if you have any such wetlands on your property. Remember you cannot drain existing wetlands, they are protected. And while a small amount of water can be taken (check with your council) from wetlands it is better to take it downstream from the wetland outlet.

To enhance and protect wetlands ideally you would fence it and exclude stock. However, you are required to not cause any significant damage such as pugging damage to your wetland. When fencing ensure you allow enough margin to cope with the expected growth of the wetland. Many councils, and increasing the government, provide funding to contribute to the cost of fencing for wetlands and riparian strips. In the initial stages there maybe a case for lightly grazing a wetland for weed control purposes.

Constructed wetlands should be planted, and existing wetlands can be enhanced by further planting. Wetlands require high density plantings (1 plant/m²) and should be planted with eco-sourced plants to enhance over hanging vegetation, nutrient extraction, and shade. The concept of the "right plant in the right place" is used in planting to reflect local ecotypes and the wetness of the soil. Expert input on planting is often available from councils, DOC, online resources, Fish and Game and consultants.

<http://www.gwrc.govt.nz/assets/Land-Management/A-Beginners-guide-to-wetland-restoration-2009.pdf>

<https://www.waikatoregion.govt.nz/assets/WRC/Services/publications/other-publications/Wetland-factsheet-3-Planting-guide.pdf>



NUTRIENT REMOVAL

Wetlands remove dissolved nitrogen largely through the action of naturally occurring bacteria and fungi which convert dissolved nitrogen sources to gases which are released into the atmosphere. There is also a small uptake of dissolved nitrogen sources by plants and algae. Plants provide the carbon source on which the bacteria and fungi grow.

Wetlands capture sediment and phosphorous (attached to the sediment) and this accumulates, so the wetland design often incorporates initial sediment traps which enable the periodic removal of sediment. This can then be dispersed to the land (away from waterways) thereby simulating the process that formed our most productive flood plain soils.

Wetlands often have open-water areas to accumulate water, provide re-aeration and areas with sunlight exposure to kill faecal disease causing microbes. However too large a pond area runs the risk of accumulating large numbers of birds which can make significant contributions to faecal microbe contamination and this needs to be considered if high E coli levels are an issue in your local waterways.

<https://www.dairynz.co.nz/media/5787389/making-the-most-of-wet-areas-on-farm.pdf>

CONSTRUCTED WETLANDS

Many landowners are now looking to construct new wetlands on their properties to reinstate nature's water filters. Identification of key places, to easily and inexpensively, reinstate wetlands is an important aspect of farm environment planning, especially on small blocks. These wetlands can often be sited to filter water coming off gullies, drains, drainage pipes or water leaving the farm. These are often sited in areas that are already wet and boggy and therefore lowly productive.

Constructed wetlands can either be constructed directly in an existing flow path. For example, modifying an open drain to convert them into wetlands. Or alongside the flow path to take water in normal flows and diverting water away in very high flows to protect the wetlands.

Each constructed wetland is a unique combination of site factors, water flows and key contaminants you are targeting as well as biodiversity goals and fish passage. Getting a good design for your wetland is important. Design considers water retention times for nutrient removal, combinations of sediment traps and wetland for sediment removal, open areas for aeration and faecal disease causing organism reduction and strategies to prevent damage during high flows.



Simple \$2000 sediment dam wetland combination in Pomahaka catchment.

Depending on the scale of your wetland you may also need to consult with an engineer. Also always check with your local council on regulations regarding earthworks around waterways. As an overview a design to ensure maximum effectiveness combines the correct proportions of pre sedimentation ponds (>0.5 m depth), shallow (<0.3 m, 70% area) and deep areas (>0.5 m, 30%).

Relatively simple wetlands, especially those not involved directly with continuous running waterways can be constructed with support from your local catchment group, council water scientist, Fish and Game and Forest and Bird.

Below is a constructed wetland created in Golden Bay by creating 4 cross drains to disperse water from an ephemeral stream and creating a pond (Earthworks \$2000) and fencing and some planting along with natural regeneration.

<https://www.dairynz.co.nz/media/5793307/provisional-cw-guidelines-final-25-04-2020.pdf>

<https://www.landcareresearch.co.nz/publications/books/wetlands-handbook>



Before and after photo of \$2000 constructed wetland in Pomahaka.

