Mid Oreti Catchment Group

Southland Wetland Directory

The first stop on Southland landowners' journeys to creating wetlands, runoff detainment bunds and sediment traps

Introduction

The Mid Oreti Catchment Group has been on a journey to learn about and understand wetlands, runoff detainment bunds and sediment traps. Throughout this journey, the group has connected with many experts and passionate wetland enthusiasts. It turns out there's a wealth of great information out there that everyone has been more than happy to share.

This Southland Wetland Directory focuses on the creation of wetlands, bunds and sediment traps. It provides access to the useful information and helpful contacts that the Mid Oreti Catchment Group has discovered along the way, and we hope it helps you on your journey too.

We update the Wetland Directory regularly and you will find the latest version on our webpage - **www.thrivingsouthland.co.nz/mid-oreti/**. We also strongly recommend that before you start your wetland project you call Environment Southland's Land Sustainability Team to talk through your idea, and their Resource Consents Team can help with clarification and advice on rules, regulations and consents too - esconsents@es.govt.nz

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How do wetlands, bunds and sediment traps help?

Wetlands, sediment traps and runoff detainment bunds have significant water quality, climate and biodiversity benefits. They help us by...

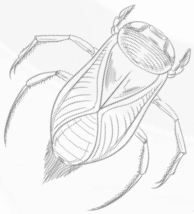
- Catching nutrients and sediment lost from land use, and stopping them flowing down our rivers into the sea - great to put back on your paddocks!

- Doing great stuff with nitrogen! Wetland plants use nutrients, and pooled water is home to bacteria that convert nitrogen into nitrogen gas or into forms that are more easily available for plant uptake.

- Increasing native biodiversity and habitat for fish, plants, birds and invertebrates.

- Reducing flooding and erosion by slowing down the flow and/or acting like sponges that gradually release water

- Sequestering and storing carbon - keeps our planet cool.



- Providing places where people can go and relax - great spots for bird watching and duck shooting. A duck pond is a type of wetland after all.

Did you know - 90% of Southland's historic wetlands have been lost

Guides and science

Constructed wetlands, detainment bunds and sediment traps have been widely adopted nationwide, with plenty of great science and resources available. We hope the following links help guide you in the right direction if you'd like to learn more.

TIP - Looking at a printed copy of this Wetland Directory? Simply google the keywords in bold and the info should pop right up in your browser.

- **NIWA - Constructed Wetland Guidelines** - Everything from practical to technical information on constructed wetlands and targeted riparian buffers for managing farm and catchment contaminant loads in New Zealand. NIWA - Wetlands Guides
- **NZ Landcare Trust - Managing Wetlands as Farm Assets** - A three-year project working with a cross-section of farmers to provide advice and share knowledge about the benefits wetlands offer the farming system and the wider community. NZ Landcare Trust - Wetland farm asset. It has good links, including the Bioeconomy Science Institute Wetland Restoration Handbook
- **Massey University - Phosphorous Mitigation Project - Detainment Bund P120** - Research carried out on the effectiveness of runoff detainment bunds on agricultural land to mitigate phosphorous and sediment loss. Massey - Detainment Bunds
- **Environment Southland**
  - **Good Management Practice information** - Good Management Practice
  - **Physiographics of Southland** - Information on the application of physiographic zones at farm level. Physiographics of Southland
- **Fish and Game Southland - Wetland Creation and Development** - A practical guide on constructing a wetland, including case studies and Southland-based rules and regulations. Fish and Game - Wetlands

Better understanding your landscape

Before hiring the digger, it's important to understand your landscape. This will help you determine the best location for your wetland or bund to maximise its value for you and your land. There are many helpful resources available, and combining them with your knowledge of the land will set you up for success.

- **Environment Southland's local maps gallery SouthMaps** - Covering soil types, water, waterways, climate data and much more. SouthMaps
- **Hedgehope-Makarewa Catchment** - Explore Hedgehope-Makarewa's landscape characteristics, susceptibilities and opportunities in this interactive mapping experience. Hedgehope - Makarewa Story Map
- **Lower Oreti Wetland Identification Project** - Showing the local hydrology network and relative wetness gradient. Lower Oreti - Wetland Story Map
- **Between the Domes Catchment Group - NIWA Wetland development** - Describing, understanding and improving the Between the Domes Catchment with wetland development. Domes - Wetland project
- **Winton Stream Catchment - Marshalling the Best Tool** - Interactive tool showing flow pathways, land wetness, erosion susceptibility and site suggestions for wetlands and bunds (with useful mitigation information). Winton Stream Storymap (including tool) - Winton Stream (arcgis.com) and Marshalling the Best Tool - Marshalling the Best
- **Manaaki Whenua Landcare Research - S-map** - Interactively explore soil maps based on S-map data. Maps include the S-map soil type (or S-map sibling), soil depth, soil profile, available water and soil drainage. Detailed factsheets (soil reports) can also be displayed. S-MAP
- **Land Air Water Aotearoa (LAWA)** - Information about local water quality and the issues relevant to that catchment. LAWA

Want more detailed information for your catchment? Talk to your local Catchment Group or to Thriving Southland about local mapping projects.

Considerations before construction

Before beginning any construction on sediment traps, detainment bunds and wetlands, we recommend taking the time to consider the following...

Is there water flowing all year round, part of the year or only after rainfall in this space? Depending on your answer, this will affect what rules apply to your situation around construction and whether you may need a resource consent. The flow frequency will determine what sort of wetland, bund or sediment trap might be best suited for this area. Environment Southland's Land Sustainability Officers are a great team to ask for advice.

- **What goals would you like to achieve?** Setting clear goals from the outset can help you determine what type of creation will best meet your needs. Here are some examples:
  - **Create habitat for wetland birds** - a ponded wetland area with Carex planted would be a good starting point to attract wetland birds like ducks.
  - **Reduce sediment loss to waterways** - a sediment trap could be constructed in a channel on farm, or a runoff detainment bund to slow down ephemeral flow.
  - **Reduce nutrients leaving the farm** - a wetland would be the best bet for this. Check out the resources and links in this directory to find out what type might suit you best.

What's downstream/downhill?
Think worst-case scenario. If a bund gave way during extreme weather, would the water dissipate across farmland or could it potentially affect neighbouring houses or important infrastructure? Considering how a creation might impact downstream or downhill areas can influence the size of the structure, the amount of water it can hold back, and the materials used for construction.

Fish passage?
Many of New Zealand's native freshwater fish, including the five species of whitebait, need access to the ocean at some stage of their lifecycle. As juveniles, they swim upstream from the ocean to find suitable habitats. Building a wetland would provide awesome habitat for these fish, but remember they need to be able to access the wetland to begin with, and move through it to reach higher habitats. There's some great fish passage info on the DOC website **Fish Passage DOC**

Do I need consent? What can I do without consent?
A good starting point is to gather up all the info about your proposed creation and check the rules section in this directory. It's also a great idea to have a yarn with some experienced folk. The following are good starting points:

- Environment Southland's Land Sustainability Team
- Southland Fish & Game
- Your local Catchment Group
- Thriving Southland Catchment Group Coordinators: they can put you in touch with people who have done similar projects.

Rules to think about

Before you turn your idea into action, we **strongly recommend** seeking advice and confirmation from Environment Southland, especially if your project is within, or within 100m of, a natural wetland. Natural wetlands are getting very rare and have specific rules to protect them - a quick chat can be very helpful.

For advice on your on-farm options, possible funding support and permit requirements, please contact the Land Sustainability Team at Environment Southland. Consent advice can be obtained from the Resource Consents Team - esconsents@es.govt.nz

Getting a bit more technical
Rules and regulations can change, so it's important to check the latest ones with Environment Southland.

As at August 2026, key rules to look at are Rule 74 of the **Southland Water & Land Plan** (SWLP), and Regulations 38 and 55 of the **National Environment Standards for Freshwater** (NES-F), which set out permitted conditions for wetlands located within a lake, river or modified watercourse.

For greater detail on the relevant rules, refer to the SWLP, particularly:

- 49 - Abstraction, diversion and use of surface water
- 55A - General conditions for activities in river and lake beds
- 59 - Culverts
- 59A - On farm sediment traps (within intermittent or ephemeral waterways)
- 60 - Dams and weirs
- 74 - Wetlands

Wetlands are defined in the SWLP, the NES-F: Regulations 38 & 55, and Subpart 3 of the **National Policy Statement Freshwater** (NPS-F). If one or more of these definitions apply to your work site, the relevant rules under the SWLP and/or NPS-F will apply: Definitions can be found here:

- **wetland** - SWLP - **Southland Water & Land Plan** (glossary on page 118)
- **natural wetland** - SWLP - **Southland Water & Land Plan** (glossary on page 112)
- **natural inland wetland** - NPS-F - **3.21 Definitions relating to wetlands and rivers**

An important thing to remember with dams is that there are requirements under the Building Act for dams over 4 metres, and the risk to life and property increases with increased dam size and water impoundment. Therefore larger dams (and larger bunds may too) require resource consent and building consent - **Dam Safety Requirements**

Also, if installing any structure within a waterbody (including culverts, weirs or dams) fish passage needs to be provided for too - **NES-F Subpart 3 - Passage of Fish affected by structures** or contact Environment Southland for more information.

Ultamitely, special conditions exist for activities in or near existing natural wetlands (even if they don't look very flash), so contact the Environment Southland's Land Sustainability Officers to talk about your plans before you start.

The Steps - Starting out

So, you're interested in constructing a wetland, bund or sediment trap but don't know where to start? Here are some suggested steps from those who have successfully completed similar construction projects.

1. Identify the location - You know your land better than anyone else! Look for areas where water accumulates and flows after heavy rain and think about your difficult wet spots. These are great places to work on.

2. Set your goals - What do you want to achieve?

- slow down water flow
- increase biodiversity and create habitats
- capture and reduce nutrients
- collect sediment

3. Seek inspiration - Visit similar projects for ideas or talk to someone who has done this before. Reach out to your local Catchment Group or neighbours for advice, or contact the experts listed in this directory.

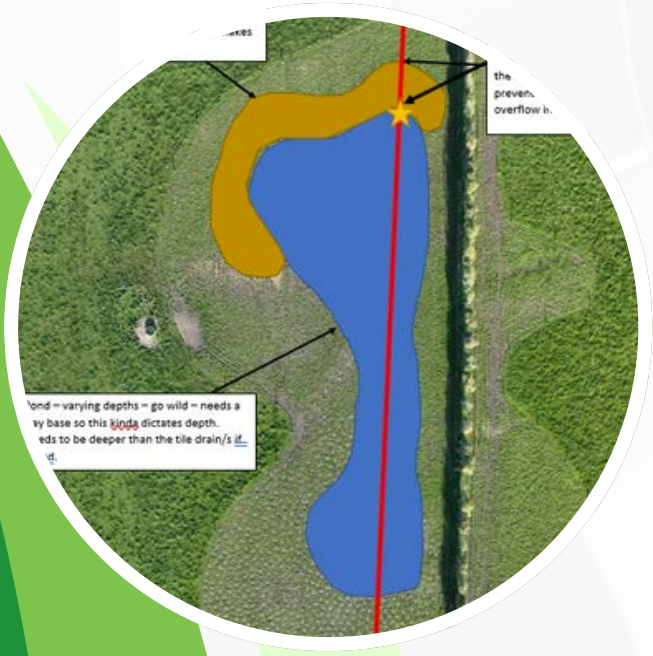
4. Choose the right construction - Match your goals to the right structure. Wetlands boost biodiversity, while bunds and sediment traps are better for sediment capture. Check out our 'Guides and science' and 'Better understanding your landscape' sections, and talk to people about your ideas. Understanding your landscape and soils can really influence what you choose to do.

5. Know the rules - Familiarise yourself with relevant rules and regulations. Have a look at our 'Rules to think about' section to understand what you can do without consent, and what might require it. Talk to other farmers who have done similar projects and run your ideas past your local Environment Southland Land Sustainability Officer.

The Steps - How to build

Now that you've chosen your spot, set your goals, and checked the rules and regs, it's time to get started. This is where the fun begins!

1. Marking out & fencing - A great starting point. Stand in the paddock and think about how it could work - where could the fence go? Does a gateway need to be moved? Make a rough drawing - you could even jot down some points to think about. Remember, fences don't need to be straight. If your plan includes lots of earthworks, consider temporary fencing or just marking out with spray paint until the work is done. Consider heavy machinery movements and whether a fence might limit them.



2. Draw up a plan - Now that you've identified the area and know exactly what you want to build, it's time to draw up a quick plan. This can be as simple as printing out a farm plan, photo or a Google Map, and noting down features such as:

- ponded water areas - temporary and permanent standing
- inlets and outlets (if any)
- planting areas
- tile drains (if known)
- bunded areas

A map using LiDAR is useful for understanding contours and how the landscape will best help you.

3. Invite someone with experience to have a look at your area and go over your plan - Discussing your plan with an expert can help ensure you're following regulations and provide advice on whether you need consent. They might also offer design suggestions. You can reach out to organisations like Environment Southland's Land Sustainability Team, Southland Fish & Game, or a rural environmental consultant. Most of these organisations have access to better maps utilising LiDAR. Just keep in mind, that for larger or more complex projects, you may need to do additional planning after your meeting.

4. Construction - Once your plans are finalised, get together with your contractor and seek expert help to go over your plan. This will help to keep everyone on the same page and how to best achieve your goals. You can either hire a local earthworks contractor — many have experience constructing duck ponds and wetlands across Southland — or, if you're skilled with a digger, consider renting the equipment and starting the construction yourself. It's worth getting quotes from a few different contractors as costs can vary. Good communication throughout your build with your contractor is key.

5. Give it time - Allow some time to see if your project is progressing as expected. Often, adjustments are needed to improve performance. For example, if a bund is draining too quickly for effective sediment removal, you can simply reduce the outlet pipe size.

6. Plant the area out - A wetland will greatly benefit from having some initial native wetland vegetation planted. Check out our recommendations for plants in the 'Plants' section of this directory.

TIP - If you've built a ponded area, either laser level out the maximum height your water will reach, or wait until it fills up before planting. Very few plants can survive being inundated year round. Carex is ideal closest to the water. It doesn't mind wet feet!

Is it working?

How can you tell if your wetland, bund or sediment trap is working? Sometimes it's as simple as going and taking a look! You don't always need to fork out for testing.

Sediment traps - A sediment trap filling up with sediment is definitely working. After heavy rainfall, check if the water exiting the trap is clearer than the water entering; this is another sure sign it's doing the trick. To remain effective, the sediment in the trap should not reach the same height as the outlet or inlet, as shown in the photo. Take a look at this full trap that is ineffective in this state. In this case, it's ready for a careful cleanout with a digger. Don't forget to put the sediment back on you paddocks. It's full of goodies!

Detainment Bund - After rainfall...

- is there water pooling behind the bund?
- is this water being released downhill slower than it would be without the bund?
- is there sediment left on the grass or behind the bund when the water is gone?
- is there a noticeable drop in flow or flooding downstream from the bund, and is this water less murky?

If the answer is yes, then the bund is certainly working. Take a look at this photo. After heavy rain this runoff detainment bund is doing its job perfectly. The water will subside in a couple of days, allowing the grass to start growing again, using the nutrients left behind.

Wetlands - While you can't directly observe a wetland reducing nutrients, you can estimate nutrient removal using NIWA's wetland guides and their handy nutrient calculator. Find the link in the 'Guides and Science' section, and be inspired by the Pomahaka pages later in the directory.

If you made a wetland for biodiversity and habitat benefits, or to sort out a problem area on your farm, you can often see the positive changes.
Are there more birds, fish and bugs? Are your wetland plants healthy and thriving? Are your paddocks and farm animals happier and healthier?

The man-made pond on the right provides great habitat and has sorted out a wet area of paddock.

Want to know more about what's living in your stream or wetland and how to check if it's healthy?

There are some great resources out there to help you study your stream, including how to do a Rapid Habitat Assessment (RHA) and examine macroinvertebrates (the tiny bugs in your stream).

Check out Bob, who is examining some macroinvertebrates he collected using a sieve and ice cream containers.

Follow these links for guides and great videos: Water monitoring - NZ Landcare Trust - Rapid Habitat Assessment - Cawthron - SHMAK videos

Potential funding

Various funds are available that may help finance your wetland, bund, or sediment trap project. Take a look at the list of contacts below that often provide funding or can connect your project with environmental enhancement resources.

- **Environment Southland** - Environment Southland have a range of funding opportunities that could help you. Reach out to their Land Sustainability Team to ask about funding that might be suitable for your project. Environment Southland: Funding & Support
- **Southland Fish & Game** - Funding could be available to help you construct a wetland, particularly if it will create good habitat for game birds. Fish and Game Funding
- **Your Local Catchment Group** - Southland's Catchment Groups have resources available to help you source funding for projects. Find your local Catchment Group here: Southland Catchment Groups
- **Thriving Southland** - Thriving Southland has a wide network of funding opportunities and may be able to link you up with suitable funding for your project, particularly if it benefits the wider catchment and community. Thriving Southland Call one of their Catchment Coordinators to see if they can help. Catchment Coordinators
- **MPI On Farm Support** - The on farm support team may be able to link you up with a suitable funding opportunity. On Farm Support

Plants

Plants are an essential component to any wetland. They offer many benefits, including nutrient uptake and providing habitat and food for wetland-loving birds, fish and insects.

Establishing plant cover in a wet area? These plants are key for beginning wetland planting in Southland.

Carex secta* & *virgata

Flax - *Phormium tenax*

Toetoe - *Austroderia richardii*

Cabbage Tree - *Cordyline australis*

Manuka - Leptospermum scoparium

Ribbonwood - Plagianthus regius

Mingimingi - Coprosma propinqua

Red Tussock - Chionochloa rubra

There's plenty of great plant knowledge in Southland. Check out these links for more info:

- **The Southland Community Nursery** - Local experts share everything, from wetland planting lists to restoration tips. Community Nursery

- Two fantastic guides to help you grow your own natives from the **South Otago River Care Group** and the **AB Lime crew**.
  - Otago South River Care Start your Own Nursery
  - AB Lime Seed Collecting Calendar

Need plants? Get in touch with one of our many local native plant nurseries.

- **Pukerau Nursery** - Pukerau Nursery
- **Green Machine** in Tuatapere - Green Machine
- **Te Tapu o Tane** in Invercargill - Te Tapu o Tane Nursery
- **Plants South** in Invercargill - Plants South

TIP - Get in touch with your local Catchment Group! Many groups have projects on growing native plants and small community-based nurseries.

Want a hand with planting or maintenance? Or prefer to let someone else take the lead? There's some great help locally. Check out these local legends:

- **Fork and Spade** - On farm planting, planting planning and maintenance. Fork and Spade
- **NZ Conservation Services** - Pest control, planting, maintenance and planning. Call Toby Haliday on 027 319 7920 or email toby@nzconservation.nz

Protecting your precious plants when they go in the ground will boost their chances of survival. There are plenty of plant protectors and weed mats available locally and nationally to help with this.

- **Garto** - Dipton locals redesigned plant guards to provide better survival and less work. Garto
- **Advance Landscape Systems** - A range of plant guards and mats. Advance Landscapes
- **Future Ecology Em-guards** - The original cardboard plant protector. Em-guard

TIP - Got some old sheep dags? Stuff these into the bottom of your plant guards to save on buying weed mats. Ask your Catchment Group if they can put the word out that you want dags.

Filling in the gaps - 'Go-to' contacts

We hope we've already pointed you in the right direction with many contacts throughout this directory. To help fill in any gaps, here are some additional contacts that can assist with constructing wetlands, bunds and sediment traps.

Wetland, Bund and Sediment Trap Design Advice

- **Collaborations** - Involved in wetland and catchment projects nationwide. Mitigation design and catchment mapping, through to technical advice on rules and regulations. Collaborations

- **Land Water Science (LWS)** - Involved in many Southland-based projects. The team has extensive knowledge of Southland and wetlands, bunds and sediment trap design. LWS

- **Ryal Bush Transport - Contracting Division** - The Ryal Bush Contracting team has vast experience and knowledge in the rural sector, construction, and the Southland environment.
  Contact: Nick Webb, Contracting Operations Supervisor
  Email: nick.webb@ryalbush.co.nz - Ryal Bush

Equipment Hire

- **Fiordland Hire** - Te-Anau - Mini Digger Hire. Fiordland Hire
- **AdvanceQuip** - Gore - Mini to heavy digger hire. AdvanceQuip
- **Hire and Go Winton -** Winton - 1.7-2.5 tonne digger hire. Winton Hire
- **Hirepool -** Invercargill & Gore - Mini to larger digger hire. Hirepool
- **Southland Hire** - Invercargill & surrounds - Mini digger hire. Southland hire
- **Southland Machine Hire -** Invercargill - Larger diggers and dozer hire. Machine Hire
- **Two Tyre Tracks and Hire** - Invercargill - Mini diggers charged by machine hours. 2TyreTracks

Projects in our backyard

There have been some great wetland, detainment bund and sediment trap projects carried out in Southland. Check out the following projects and links for inspiration.

TIP - Looking at a printed copy of this Wetland Directory? Simply google the keywords in bold and the info should pop right up in your browser.

- **Living Water - Waituna Lagoon Project** - Focusing on designing and implementing a catchment-wide nutrient and sediment management approach, with the main goal of slowing the flow of water to decrease contaminants and build freshwater habitat. Living Water - Waituna

- **Aparima Community Environment (ACE) - Sediment Trap Network** - Information and case studies on sediment traps built in the Aparima Catchment. ACE Sediment Trap

- **Southland Fish & Game - Wetlands** - Involved in creating wetlands across Southland. Check out some inspirational before and after shots on their website. Southland Fish and Game - Wetlands

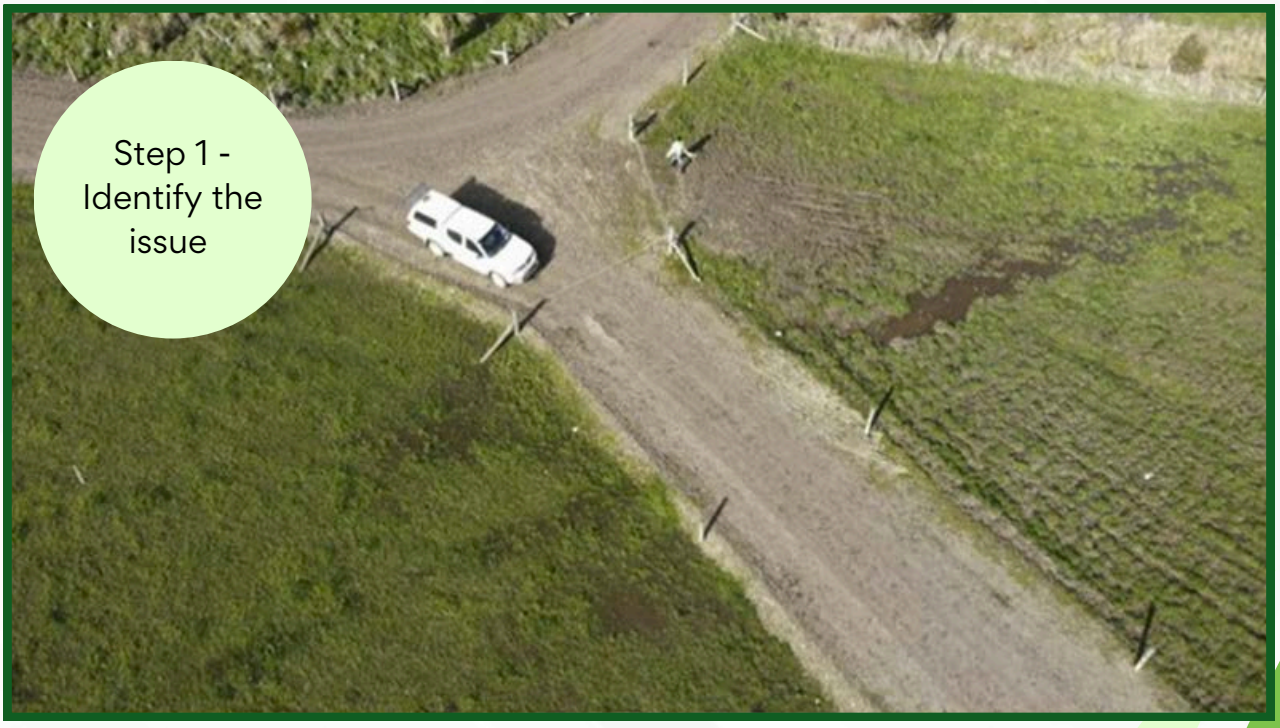
- **Pomahaka Water Care Group - Wetland Creation** - Discover the fantastic wetland creation and trial work our neighbours in the Pomahaka region have been undertaking. For more details, see the end of this section or visit their website. PWCG - Wetlands

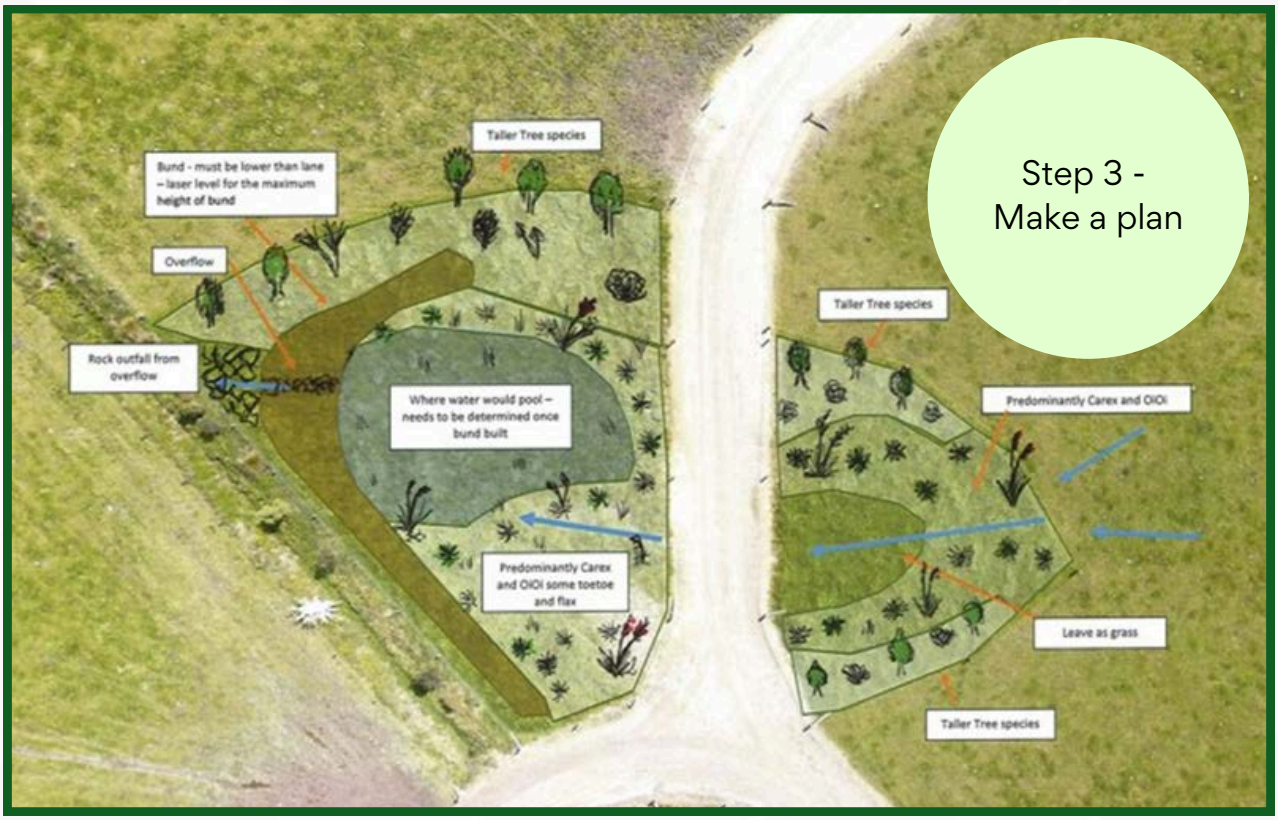
- **Between the Domes Catchment Group - NIWA Wetland Development** - Focusing on describing, understanding and improving the Between the Domes Catchment through wetland development. Domes - Wetland project

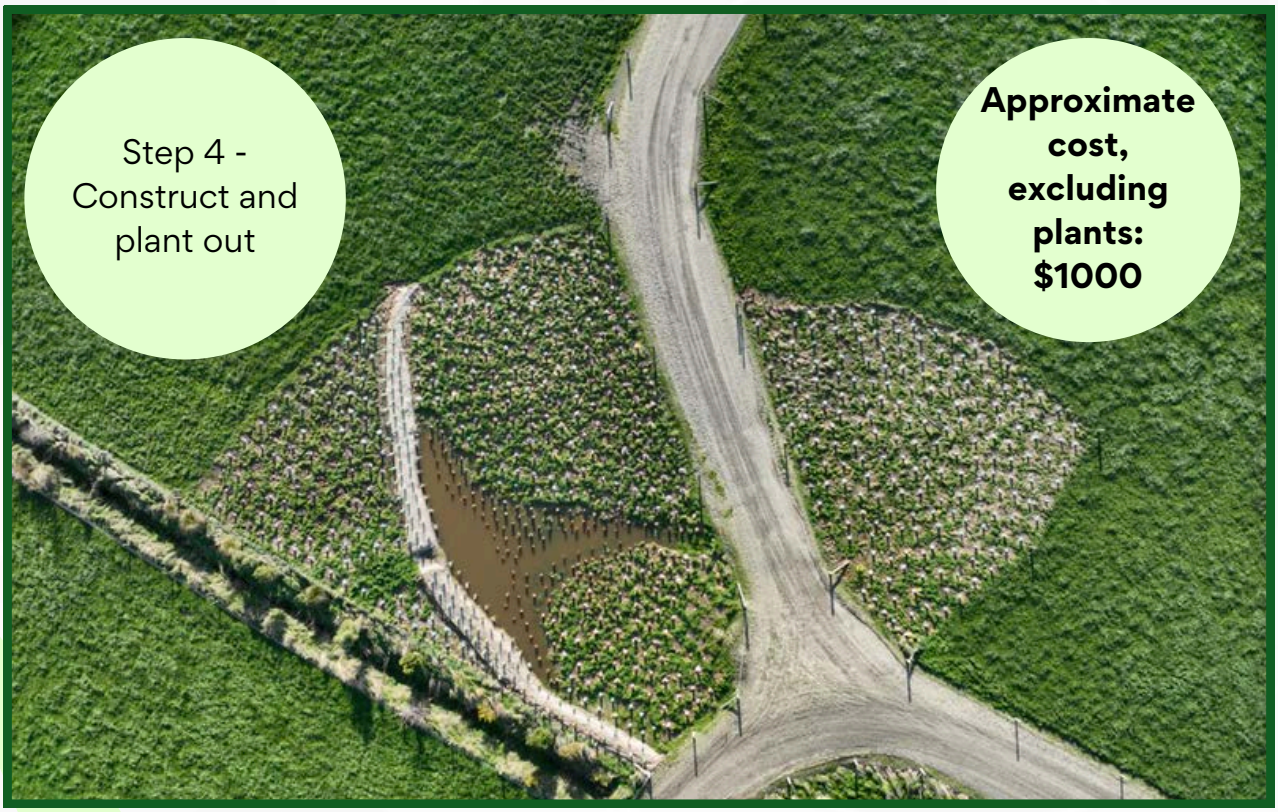
Building a small runoff detainment bund

AB Lime Dairy Farm - Winton

After a heavy downpour, it was observed that surface runoff was flowing directly into a channel from the dairy farm flats. This area was almost flat with a smaller catchment of around 20ha. The affected area, located just before the channel, was fenced off, and a plan was developed to construct a small detainment bund to slow the flow. This bund would allow sediment to settle out, preventing it from entering the channel. Overall, this was a cost-effective and straightforward solution. It took only two days to construct using a 1.8-tonne mini digger and approximately 400 native plants.







Planning this bund involved initially assessing how far back water could pool based on the height of the bund before becoming a nuisance, such as flooding over the lane. This was evaluated using a laser level, with the height of the lane set as the maximum height of the bund, and an overflow cut made below the height of the lane. Using the laser level, the area where water would pool at its maximum could be marked out. Since there was no productive area affected by pooling water, it was decided not to install any artificial drainage in the bund, such as pipework. Instead, an overflow was installed to allow for overtopping during extreme rainfall events. The water slowly soaks through the soil in the days following rainfall. This bund has captured 99% of rainfall so far, with only one flooding event occurring over the overflow. Carex virgata and secta were the main plants used here, and they are establishing well.

Building a large runoff detainment bund

AB Lime Dairy Farm - Winton

The Issue

During rainfall events there is significant ephemeral flow of dairy farm runoff from the AB Lime hill blocks. This runoff has high levels of sediment, nutrient and *E. coli* and significant volume and velocity, causing flash flooding in the lower reaches of the property. This flooding is not only a nuisance operationally but it also raises environmental concerns, including significant sediment loss off farm and to waterways, significant nutrient and *E. coli* loss to waterways, and the flooding of cow underpasses that may contain effluent.

The Research

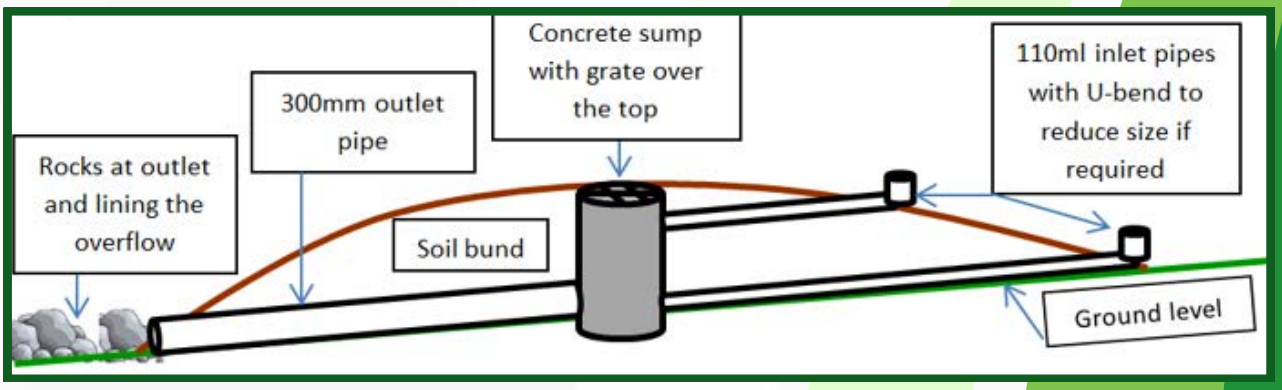
AB Lime engaged Land and Water Science (LWS) to undertake a hydrological assessment for farm contaminant retention on the dairy farm. This included researching all permanent and ephemeral water pathways to identify where rainfall across the AB Lime farm flows to as surface runoff. LWS also produced recommendations for short- and long-term mitigation measures to reduce sediment and contaminant loss off farm. The long-term measures involve retiring dairy cow grazing on 25ha of the steepest terrain on the hill blocks and planting it in native vegetation. The short-term measures involve constructing a series of soil runoff detainment bunds in the hill blocks. The catchment is 36ha which is considerably steep.

The Design

AB Lime investigated the research and construction of detainment bunds on farmland in Rotorua by John Paterson. Along with site-specific calculations and research tailored to AB Lime's hill property, two bund designs were developed:

- Bunds in productive dairy farmland – designed with a series of pipes to ensure water flows through with a planned retention time of no more than three days, allowing paddocks to still be grazed.
- Bunds in retired areas – constructed entirely of soil without a pipe network. These bunds are planted with wetland vegetation, retaining water for longer periods. These areas are not grazed by livestock.

The design of the bunds allows runoff to accumulate behind them to reduce the flow of the runoff and enhance sediment and nutrient settlement.

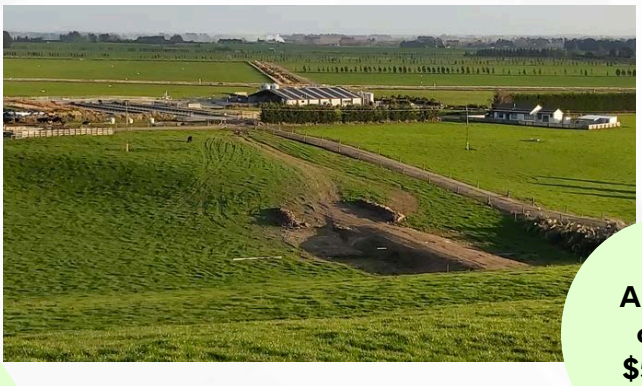


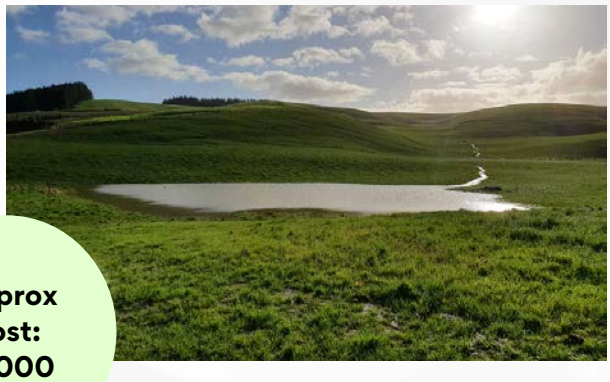
The Planning

As this was a considerably large catchment in steep terrain, planning involved firstly going out and looking at the proposed area to build the largest bund. It was decided that the most nuisance water flooding back would cause in this area was flooding a water trough. The overflow of the bund was then set to the height of the trough, which was set back from the bund area where water would pool. The next step was to ensure everything was being done within local planning rules, so AB Lime contacted Environment Southland's Land Sustainability Team to discuss further. After a very positive and proactive meeting, Environment Southland provided some rules to follow so that the bund construction remained a permitted activity and wouldn't require consent. Using a laser level, the height of the bund was set, and the extent of the maximum height of pooling water was marked out to understand how much water the structure would hold. An assessment was carried out to consider the potential impact if the bund were to fail and release its maximum pooled water immediately. Since the receiving environment was flat farmland where the water would spread out, this risk was considered minor.

The Construction

The bund was constructed entirely of soil, using clay-dominant soil for the inner structure and top soil to blend the bund into the surrounding landscape and provide a growing medium. A series of pipes and sumps were installed during construction, as per the design on the previous page. A depression was created at the top middle of the bund to provide an overflow, and this was lined with rocks to prevent scouring. The middle of the bund and the lowest points were fenced to prevent stock access and damage. A U-bend was used to rise up the two inlets to promote further ponding with adjustable sizes to modify the pooling period from one to five days. The bund is five times wider than its height, and is contoured into the surrounding landscape.





Approx cost: $5000

Success?

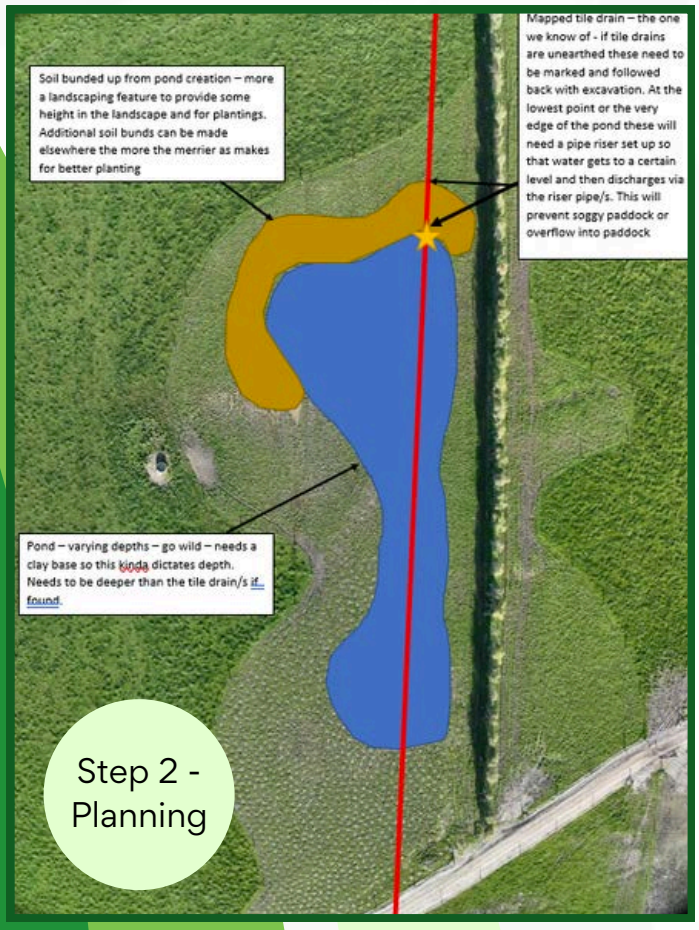
AB Lime is very pleased with the results of installing this bund. The bund significantly reduced peak flows in the downstream catchment and greatly mitigated the flooding that used to occur. Initially, the water did not pool long enough behind the bund, so the pipe size at the inlet was reduced. Now, water pools for about 2-3 days, depending on rainfall. Sediment is seen left behind on the grass after each rainfall. After three rainfall events in one week, water pooled for about five days, leading to yellowing of the grass, so pooling for less than this duration is recommended in productive areas. Four rounds of water quality testing have been conducted so far, showing an average sediment reduction of 40% and phosphorus reduction of 33%. This reduction could be improved by extending the water pooling time, and AB Lime is now considering a plug system where the plug is removed a day after rainfall to hold the water longer, but it's important to find a balance so the paddock stays productive.

Building an excavated seepage wetland

AB Lime Dairy Farm - Winton

The AB Lime dairy farm flats have notoriously wet areas, with some paddocks only grazed successfully during the few drier months of the year. They decided the best use of this land moving forward was to create a wetland, with the main goals of providing habitat for wildlife, increasing biodiversity, and potentially creating an area for duck shooting on the farm.

Farm manager Mitch marked out a wet area by walking along noting pooling water at the surface and poor grass growth. Mitch knows the area well - it's particularly wet all year round. This area was then fenced off.



Keeping the goals in mind for the wetland area, a plan was drawn up on a map. This included a ponded area with plenty of space for complementary wetland plantings. Water quality was not a primary focus for this wetland as there was no inflow or outflow of water in the form of a creek or channel. Avoiding flooding of tile drains was important, so the team looked at tile drain maps to identify their locations.

Once a plan was established, AB Lime checked local planning rules for wetland construction and asked Environment Southland's land sustainability team to come out and confirm what AB Lime needed to follow to avoid requiring consent. The ES team always has lots of handy advice!

AB Lime engaged Ryal Bush Transport - Construction Division to construct the wetland using a dozer and excavator. Having a knowledgeable contractor helped not only achieve AB Lime's goals but also enhance them. The tile drain was a wee way off the original map, but they found it. The perforated novo-flow pipe was cut off at each side of the ponded area. It was then rejoined using a solid pipe to prevent water from flooding back through the tile, creating unwanted wet areas on the farm or draining all the wetland water away. An overflow outlet was installed so if the wetland pond gets too high after significant rainfall, the pond will discharge into the tile instead of flooding neighbouring paddocks. There was no complicated sealing of the pond, as the soils were clay dominant, creating a natural base seal. The soil from the excavated pond was pushed up and contoured into a bund around the wetland pond for aesthetics, creating some elevation in the flat landscape and a raised area for planting.

Once the wetland construction was finished, AB Lime began planting the area. The area closest to where the pond water would sit was left until the pond filled, which took about three months. The pond is now home to a range of birds, including pied stilts, kingfishers, herons, oyster catchers, and lots of ducks. Carex virgata and secta are thriving in the wetland!

Approximate cost - excluding planting = $10,000 - 0.4ha pond.

Pomahaka Catchment Project Mitigation Trials

Pomahaka Water Care Group
Tiakina te mauri o te wai

Instream sediment trap & planting - Tapanui

Waterway: Permanently flowing
Process: Instream sediment trap, fencing, planting

Contaminant reduction highlights:

Sediment	38%	Phosphorus	24%
Nitrogen	47%		

Constructed wetland - Waipahi

Waterway: Intermittently flowing tile drain
Process: Sediment trap, followed by two bay constructed wetland, flowing into wetland areas fencing, planting

Contaminant reduction highlights:

Sediment	63%	Nitrogen	55%

Edge of field wetland - Waikoikoi

Waterway: Intermittently flowing waterway
Process: Instream sediment trap, followed by wetland area
Highlights: AgResearch have chosen this site to undertake further research to how effective wetlands are at mitigating contaminant loss from land to water

Contaminant reduction highlights:

Sediment	26%	Phosphorus	25%
Nitrogen	37%	*E.coli*	62%

Instream wetland - Clydevale

Waterway: Intermittently flowing waterway
Process: Instream sediment trap, followed by wetland area
Highlights: AgResearch have chosen this site to undertake further research to how effective wetlands are at mitigating contaminant loss from land to water

Contaminant reduction highlights:

Sediment	39%	Phosphorus	12%
Nitrogen	10%		

Ministry for Primary Industries Manatū Ahu Matua
Sustainable Farming Fund
NZ LANDCARE TRUST
Otago Regional Council
Fish & Game NEW ZEALAND
ERNSLAW ONE LTD

Thank you

Lots of wonderful people and organisations helped us with this project. They shared their time, knowledge and experience, and helped fill its pages with practical and useful local information.

Thank you to all of you, especially:

- AB Lime
- Christina, Cam & Wally Nelson
- Clare & John Officer
- Keith Finlayson & Rob Bird - Environment Southland
- Land & Water Science
- Rosie Forbes & Fortuna Farms - Piriti
- Tom, James, Stu & Jono - Collaborations
- Zane Moss & Ben Febery - Southland Fish & Game
- Thriving Southland

Our final thank you must go to Ainsley Adams who was the driving force behind this project and this booklet. Ainsley did an amazing job of pulling it together, and still helps and supports us from her new home in Dunedin.

Got any ideas?

The Mid Oreti Catchment Group created this resource as part of our Marshalling the Best Wetland Project.

We are happy to update it regularly. If you have any ideas, information, or anything that could make our Wetland Directory even more useful, please contact Sarah at Thriving Southland - sarah@thrivingsouthland.co.nz or 027 588 5200

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