

# Stop your farm going down the drain

**Soil is the most valuable resource on your farm. Agricultural practices can cause many tonnes of soil to be lost into waterways. Soil loss reduces farm production and damages our rivers and estuaries.**

You can stop this by capturing the soil before it leaves your property by creating ponds in small open or tiled catchments. The ponds can also be used for duck shooting, stock water, nutrient stripping, wildlife habitat, drainage and farm aesthetics.

The ponds can be designed to suit each individual site and situation and do not take up a lot of land or require high maintenance. Initial costs are not high, with three to five year pay back periods expected when the captured soils and nutrients are spread back onto your farm land.

## Basic farm pond example – built 2009, cleaned out 2013

<b>Location:</b>	Pourakino Valley in Southland on a dairy farm
<b>Catchment:</b>	23.31ha of pasture with some lanes, waterway 90% tiled
<b>Pond:</b>	10 x 30 x 1.5 metres built in 2009; cost \$500
<b>Soil captured:</b>	118 cubic metres of slurry containing 37.7 tonnes of soil
<b>Soil content:</b>	3.3 tonnes of carbon 201.5kg of nitrogen and 47.8kg of phosphorus
<b>Cost recovery:</b>	In four years \$558 worth of fertiliser recovered
<b>Cost savings:</b>	Drain below pond did not require cleaning during the four years saving \$370

## Activities that require consent:

- Weed and sediment removal from a lake or natural watercourse that has not had previous drainage maintenance work carried out at that location requires resource consent.
- Diversion of water from any naturally occurring wetland requires resource consent.
- Channel deepening and/or significant rebattering (reshaping) of the banks to increase channel capacity requires resource consent.



▶ Pond prior to cleaning



## Pond upgraded to capture more soil

While the basic pond had successfully collected much of the heavy soil particles, finer material which holds most of the phosphorus was still being lost. To capture smaller particles the water needed to be held for longer to allow the material to settle, so a second section was added in 2013.

The new pond design is based on NIWA science and on-farm practicality and now consists of two separate sections joined by a culvert pipe. The water flows slowly through both ponds before re-entering the field tile.

The two ponds have full digger access for easy removal of the accumulated sediment, which can be returned back to the paddocks using a muck spreader, or allowed to drain by the ponds then moved with a front-end loader.

The pond is designed to handle most normal flows the catchment receives. During flooding, the bunding around the ponds can contain and slowly release large volumes of water that will filter through grass and plants before going into the field tile.

Based on the value of the nitrogen and phosphorus fertiliser from the original pond collected each year and the increased efficiency of the new pond, it is estimated the payback period will be three years, with on-going savings in drain maintenance.

A single hotwire will be placed around the site and, once grass cover is established, will be planted to increase nutrient stripping and provide bird habitat.

<b>Pond size:</b>	30 x 20 x 1.5 metres and 30 x 10 x 1.5 metres
<b>Storage capacity:</b>	960,000 litres
<b>Cost:</b>	\$2325
<b>Cost recovery:</b>	Estimated three years based on 2013 fertiliser values
<b>Land area:</b>	58 x 48 metres or 2784 m <sup>2</sup>

*Reference - New Zealand guidelines: Constructed Wetland Treatment of Tile Drainage. NIWA Information Series No. 75*

Despite the many methods and good practices used today to reduce soil losses to waterways, substantial amounts are still lost.

Good pond design and placement can reduce the amount of sediment being lost to our waterways.

## Further assistance

Every farm is different and some activities require resource consent, so having the expert advice of a land sustainability officer is recommended.

To arrange a free visit please contact Environment Southland's land sustainability team on (03) 211 5115 or 0800 76 88 45.



▶ Two ponds now capture more fine material.