

Ōhau Diversion Wall



The Ōhau diversion wall on Lake Rotoiti has been constructed as part of the Rotorua Lakes Protection and Restoration Programme.

The partners in the programme are Bay of Plenty Regional Council, Rotorua District Council and Te Arawa Lakes Trust. The diversion wall is part of a \$200M programme of protection on 12 Rotorua lakes. The 12 lakes vary in their water quality, from near pristine to highly eutrophic.

Seventy percent of the nutrients reaching Lake Rotoiti come from Lake Rotorua via the Ohau Channel. The diversion wall is designed to divert the nutrient-rich flow from Lake Rotorua through the Ohau Channel away from Lake Rotoiti, directly down the Kaituna River.



Construction of the wall took place over 2007/2008 and was completed in July 2008. It is a sheet pile wall 1275 m long attached to the lake bed with king piles up to 70 m deep in places. It has been designed with a low profile which extends 500 mm above the water surface so it is not visually intrusive.

The construction cost of the wall was just under \$9M, with additional design and consenting costs of about \$1M. The wall was funded by Bay of Plenty Regional Council with a \$4M contribution from the Government.

The diversion wall is one component of three major interventions for Lake Rotoiti. The others include;

- Sewage reticulation or advanced onsite treatment

The project is a long-term programme to improve Lake Rotoiti's water quality.

Associated with the wall is a comprehensive monitoring programme looking at:

- water quality including algae
- lake mixing
- trout and native fisheries
- bird life around the wall

This monitoring is designed to measure the success of the wall and identify any areas where mitigation is necessary. At the outset, for example, the wall has not incorporated specific design features to address fish passage. It is not clear if fisheries will be affected, but monitoring has been designed to test this over a five year period. The results of this monitoring will be used to assess the need for mitigation.

Bay of Plenty Regional Council is also commissioning work to investigate how to enhance the fisheries if there are negative results from the diversion wall.

The construction of the diversion wall was authorised by resource consent, and the conditions imposed are designed to ensure protection of the environment. Included in the conditions is a requirement to obtain fisheries advice on the monitoring programmes and cultural advice on the structure. Regular dialogue is maintained to honour the intent of these conditions.

THE ROTORUA LAKES

Protection and Restoration Action Programme

A Bay of Plenty Regional Council, Rotorua District Council and Te Arawa Lakes Trust joint project.



Bay of Plenty Regional Council is also working with the University of Waikato to further develop lake water quality models to predict the impact of any changes in lake water quality arising from the wall. Long-term predictions will also include the effects of climate change and land use change. This is important to ensure we have the ability to identify future risks to water quality and if necessary, undertake interventions to address problems.

The wall is an engineering intervention within the natural environment. It is predicted to reduce harmful algal blooms by 40 percent in the lake within five years. It may not necessarily prevent all algal blooms, but the risks associated with algal blooms will be significantly reduced.

Algal blooms are identifiable as a green scum around parts of the lake, particularly in sheltered bays. Some species of bloom-forming algae can also produce toxins that can affect animals and humans. As algal blooms die and decay, their decomposition can also result in strong and unpleasant odours around some lakes, and even fish kills and deoxygenation of deep waters.

Will it harm the fish or waterbirds?

We're confident it won't affect the birds but are still researching the potential disruption to fish spawning and migration patterns. It's hard to exactly predict the ecological effects of a project like this, so we will be monitoring things very closely and making adjustments when necessary.

Won't it make the Kaituna River's water quality worse?

Scientists say the diversion wall will have little impact on Kaituna River's ecosystem (such as fish and birds), although it will cause a small increase in the level of nutrients down the river. Unlike the lake, river systems are not as affected by an increase of nutrients because the natural flow keeps the water mixed and moving and algae cannot multiply in the short travel time to the ocean.

It's worth remembering that water from Lake Rotoiti already flows into the Kaituna River. In 2004 there were warnings about the levels of cyanobacteria in the river for the first time. To make sure the river stays protected we are developing a Kaituna River Management Strategy.

What will the effect on Maketū be?

It's likely to have little effect on the Maketū Estuary. At high tide, just one tenth of the estuary's water volume comes from the Kaituna River.

We already monitor the estuary and Kaituna River for algal toxins and will continue to as part of the annual monitoring programme. When cyanobacterial numbers reach high levels in the Kaituna River, cyanobacterial toxins will be monitored in Maketū shellfish.

Why not fix the problems in Lake Rotorua?

It's extremely important that we improve Lake Rotorua's water quality too. A lot of work is being done towards that, including a multi-million dollar sewerage reticulation programme, upgrades to Rotorua's sewerage treatment, and new rules for farming.

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