Rotorua Te Arawa Lakes Programme

Snapshot of Progress 2013-2014

Ko te wai te ora o ngā mea katoa - Water is the life giver of all things

Successes for 2013-2014

- Five lakes at water quality target and three others very close to target
- Completed final action in Lake Rotoehu Action Plan of land use change agreement in catchment to remove 4.4 tonnes of nitrogen
- Project Steering Committees established to identify options for wastewater treatment and Rotoiti/ Rotomā sewage reticulation
- Approval of integrated approach to nutrient reductions for Lake Rotorua rules and incentives, including:
  - Crown transfer of funds for incentive scheme
  - Gorse conversion fund to remove 30 tonnes of nitrogen
  - Draft rules to limit nitrogen losses prepared for consultation
- Revised Strategy for the Lakes of the Rotorua district adopted
- Science Plan developed and approved
- Land Technical Advisory Group approved to provide advice on land-based nutrient management solutions.

ROTORUA TE ARAWA LAKES PROGRAMME

The Rotorua Te Arawa Lakes Programme is responsible for meeting water quality targets in 12 Rotorua Lakes. Great achievements were made in the last year to help improve and protect water quality in our lakes.

Message from Sir Toby Curtis, Chairman, Rotorua Te Arawa Lakes Strategy Group

Toitu te wai *Let quality water prevail*
Toitu te whenua *That the land flourish*
Toitu te tangata *May humanity remain forever*

"The Lakes are so important for our city and our people. They are a part of us. We have a responsibility to ensure the lakes are in a state to assist our people to live and it is heartening to see improvements in many of our taonga. It's testament to the programme's innovation and can-do approach."

Great results for water quality

Our actions have improved the health of the Rotorua Te Arawa Lakes.

Annual monitoring showed the best water quality results achieved in the programme's history with five lakes at target and another three very close to their targets. Several lakes experienced the best water quality in decades.

While the annual results are promising, external factors such as climatic conditions can affect water quality from year to year. We also need to look at the long-term trend in each lake.

The long-term trends are also extremely positive with nine out of 12 lakes showing stable or improving water quality.

The improvements are the result of taking both short-term and long-term actions. This has meant the community can enjoy improvements in the lakes now while long-term actions are implemented and take effect.

Short-term actions include lake weed removal and alum dosing in streams to lock-up phosphorus while long-term actions include sewage reticulation, land use and land management change.

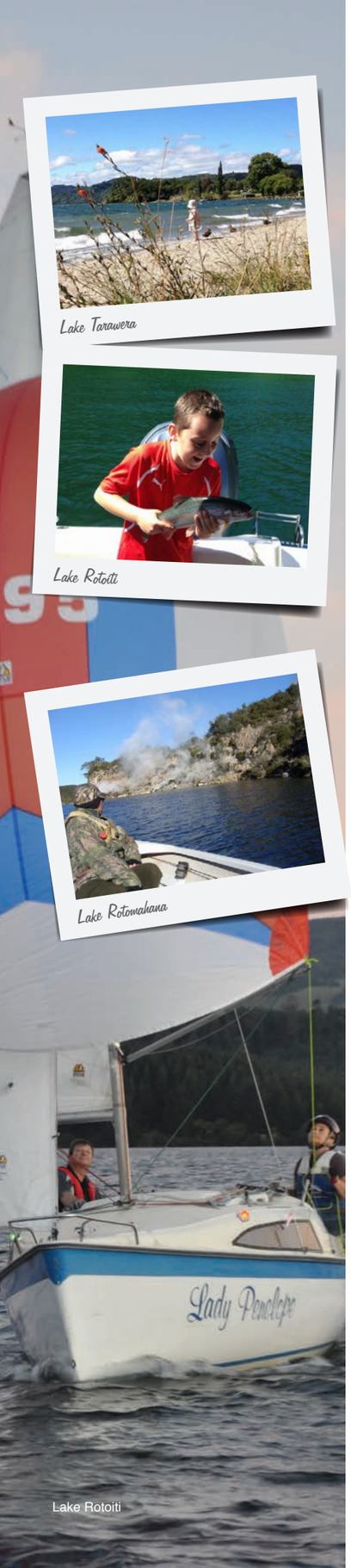
Measuring our progress

Our goal is to improve water quality and the overall health of the Rotorua Te Arawa Lakes.

Progress is measured against water quality targets, set in consultation with the community based on a period of time when people were happy with the water quality in each lake. This point in time was converted to a number called the Trophic Level Index (TLI); a water quality measure used to indicate the health of the lakes. It is calculated using four separate water quality measurements; total nitrogen, total phosphorous, water clarity and chlorophyll-a.

An annual average of the TLI is used to measure progress made towards protecting and improving the Rotorua Te Arawa Lakes and meeting the community's expectations.

Image - Lake Ōkataina



Rotorua Te Arawa Lakes water quality trend

Lake Rotorua

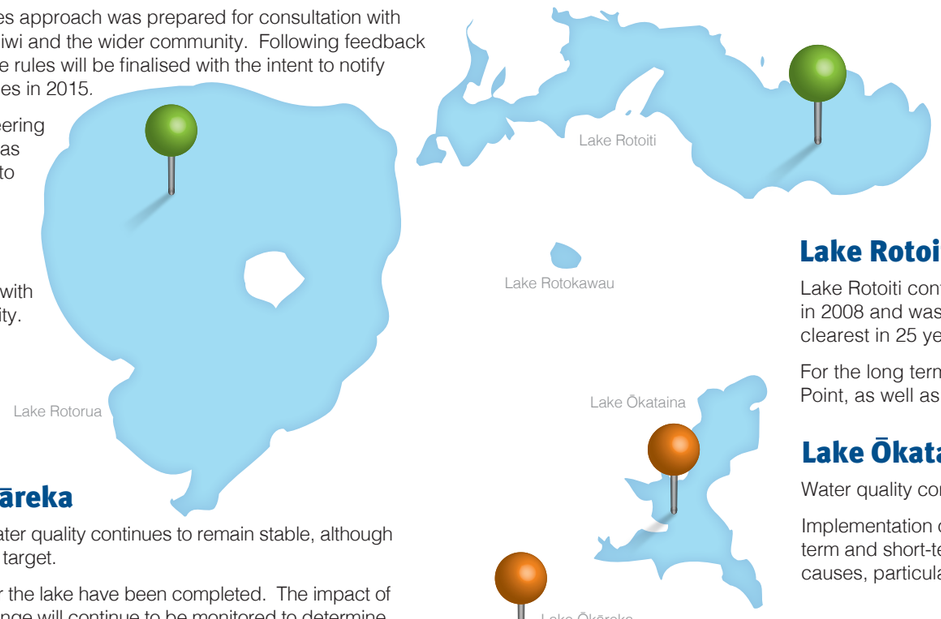
Lake Rotorua is continuing to experience the best water quality in decades and is at its target for the third consecutive year. An alum dosing programme, started in one of the lake inflows in 2007, appears to be playing an important role in the improvements.

For the long term health of the lake, reductions in nutrients from pastoral land are needed.

Significant progress was made with the Lake Rotorua Stakeholder Advisory Group to agree on an integrated programme of individual property nitrogen limits and incentives to achieve the 270 tonne nitrogen per year reduction needed from land use in the catchment.

The draft rules approach was prepared for consultation with landowners, iwi and the wider community. Following feedback and input, the rules will be finalised with the intent to notify proposed rules in 2015.

A Project Steering Committee has been set up to help identity wastewater treatment options in consultation with the community.



Lake Ōkāreka

Ōkāreka's water quality continues to remain stable, although still above its target.

All actions for the lake have been completed. The impact of land-use change will continue to be monitored to determine if further actions are needed to meet the target.

Lake Tikitapu

There was a slight decrease in the water quality for Tikitapu over the last year, but lake is still showing improvements over the long-term. All actions in the Action Plan have been completed.

Lake Rotokakahi

Water quality has improved since the severe algal blooms of 2009 and remains significantly above the water quality target.

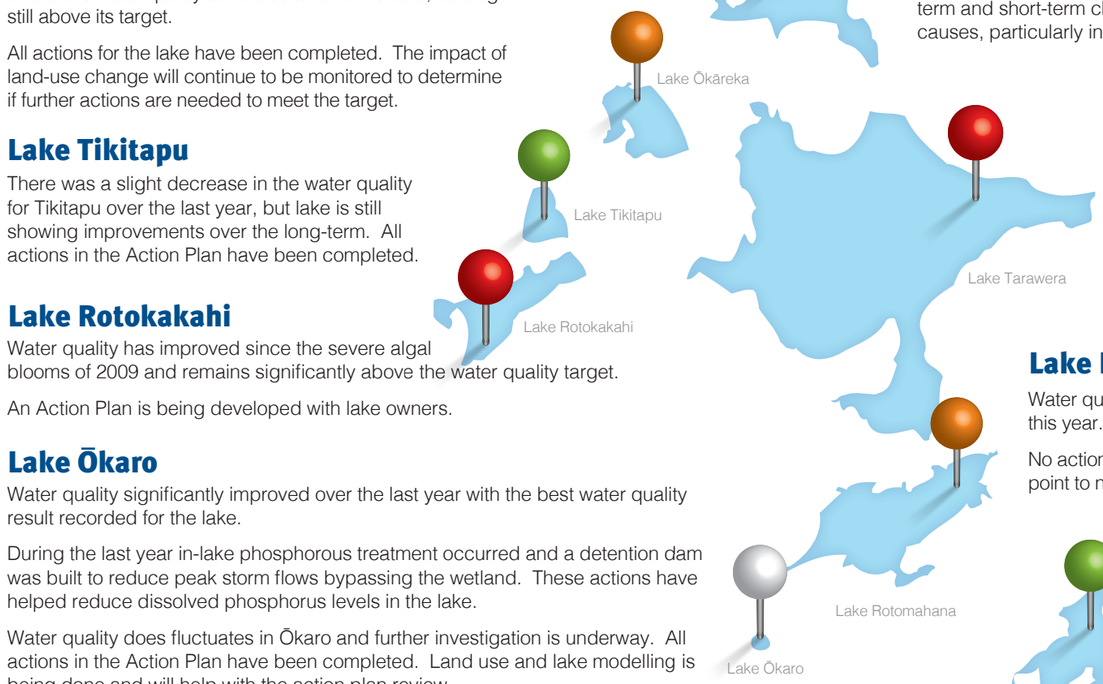
An Action Plan is being developed with lake owners.

Lake Ōkaro

Water quality significantly improved over the last year with the best water quality result recorded for the lake.

During the last year in-lake phosphorous treatment occurred and a detention dam was built to reduce peak storm flows bypassing the wetland. These actions have helped reduce dissolved phosphorus levels in the lake.

Water quality does fluctuates in Ōkaro and further investigation is underway. All actions in the Action Plan have been completed. Land use and lake modelling is being done and will help with the action plan review.



Improving | Stable | Declining | Investigation needed

Long term water quality trend

Lake Rotoehu

Rotoehu has seen substantial improvements over the last five years and has been just above its target for the last two years. During the last year water clarity was at its best since the early 1990s.

Alum dosing and weed harvesting contributed to these improvements while land-use change takes effect.

The final action from the Action Plan was completed with a land-use change agreement to remove 4.4 tonnes of nitrogen from the catchment.

Lake Rotomā

Water quality in Rotomā is stable and close to its water quality target.

The key action for Lake Rotomā is sewage reticulation. This has been delayed while options for wastewater disposal are developed in consultation with the community.

Lake Rotoiti

Lake Rotoiti continues to improve following implementation of the diversional wall in 2008 and was at its target for the second consecutive year. The lake was at is clearest in 25 years.

For the long term health of the lake more reticulation is still required at Gisborne Point, as well as sustainable improvements in Lake Rotorua.

Lake Ōkataina

Water quality continued to improve in Ōkataina and is close to the lake target.

Implementation of the Action Plan started with a PhD study to understand the long-term and short-term changes in water quality of Lake Ōkataina and the underlying causes, particularly in relation to exotic browsers in the forest catchment.

Lake Tarawera

Over the last year important work was completed to progress the Action Plan for Lake Tarawera. The lakes nutrient budget and geological model were completed, both of which will help determine the interventions needed to improve water quality.

While water quality improved over the last year, the long-term trend of water quality for Lake Tarawera is declining.

Lake Rotomahana

Water quality remains very stable, with slight improvements in Rotomahana this year.

No actions were undertaken as the lake has not yet reached the trigger point to need an action plan.

Lake Rerewhakaaitu

Rerewhakaaitu is another lake that has been at its target for the second consecutive year.

Farmers have done an impressive job in reducing nutrient loss from their land and we are seeing significant improvements in water quality as a result of their efforts.

Landowners are being supported by the programme to develop and implement their own catchment plan.

Lake Rotorua

Lake Rotoiti

Lake Rerewhakaaitu

Proud Partners

DESTINATION ROTORUA
ROTORUA DISTRICT COUNCIL

TE ARAWA LAKES TRUST

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ROTORUA TE ARAWA LAKES PROGRAMME

For more information call 0800 884 880 or rotorualakes.co.nz

Innovative solutions and research for water quality

Geothermal nitrogen removal

Lake Rotorua has a challenging nitrogen reduction target of 320 tonnes. To achieve this all possible options to manage and mitigate nitrogen need to be investigated and implemented.

About 20 to 25 tonnes of nitrogen enters Lake Rotorua annually from the Waiohewa Stream due to geothermal activity.

Innovative methods are being trialled to remove this nitrogen from the stream before it enters the lake. Trials have used locally mined zeolite and have been successful in removing nitrogen from the stream waters.

Final analysis of the trial is underway to help the design of a full scale plant for construction in 2015.

New weed harvester for programme

Weed harvesting is an effective method to remove nutrients from lakes where weed is prolific. This has contributed to significant improvements in Lake Rotoehu, removing about 3.5 tonnes of nitrogen from the lake each year.

This intervention was under threat due to a lack of a weed harvester being available in the country. The Rotorua Te Arawa Lakes Programme is now the proud owner of a weed harvester to ensure this successful action can continue.

Owning a weed harvester will also enable the investigation of weed management options in all lakes as an alternative to spraying.

Alum dosing success

The Rotorua Te Arawa Lakes Programme was an early adopter of continual dosing of low levels of aluminium sulphate in incoming streams to manage phosphorus.

It has the effect of "locking up" the phosphorus and reducing algal growth. Alum dosing has been extremely effective in Lakes Rotorua and Rotoehu.

Scientific modelling confirmed that at least some of the improvements in Lake Rotorua are due to stream alum dosing, which effectively locks up nearly 5-6 tonnes of phosphorus entering the lake each year. Modelling has shown that without alum dosing Lake Rotorua would be experiencing the frequent algal blooms of the early 2000s.

We are conscious of any effects our interventions may have on the lake ecosystems and environment. University of Waikato monitors the stream fauna where alum dosing occurs as well as lake bed sediments. This ongoing programme of monitoring has shown that levels of aluminium in fauna and sediments are similar to natural background levels.

What's next?

The focus for the next 12 months includes:

- Finalise rules to limit nitrogen loss in the Lake Rotorua catchment
- Launch Lake Rotorua Incentives Scheme to support landowners in the Lake Rotorua catchment to reduce nitrogen to meet new rules
- Progress Action Plans for Tarawera and Rotokakahi
- Construct Tikitere treatment plant for nitrogen removal from geothermal sources
- Review of completed action plans for lakes Ōkaro and Ōkāreka
- Continue development of Transferable Development Rights through the Proposed Rotorua District Plan process
- Gorse conversion in Lake Rotorua catchment
- Establish Land Technical Advisory Group to provide advice on land-based nutrient management
- Finalise design of Rotoiti and Rotomā sewerage schemes
- Complete wastewater treatment system scoping and consultation.