Lakes

Introduction

Northland has a large number of small and generally shallow lakes. The majority of these lakes were formed by dune activity and are therefore called 'dune lakes'. However some — such as Lake Ōmāpere — were formed by volcanic activity, or were artificially made. Northland's lakes are a valuable economic, social, cultural and environmental resource.

The Kai Iwi Lakes group is made up of some of the largest and deepest dune lakes in New Zealand.

The Northland Lake Water Quality Monitoring Network (LWQMN) was set up by the Council in 2005 as a means of collecting information on water quality in the region's lakes, and monitoring change over time.

The programme includes 30 lakes in the Kai Iwi, Aupōuri, Central/Karikari and Poutō lake groups. These lakes are sampled every three months to test for a range of properties including temperature, nutrients and clarity.

Lake water quality

Lakes are graded using the Trophic Level Index (TLI), which gives a measure of the amount of nutrients in the water and gives an indication of a lake's overall health.

Aquatic plants need many types of nutrients, including nitrogen and phosphorus, for growth. However, increased levels of nutrients can encourage excessive plant growth, particularly of pest plant species, and can also lead to algal blooms. High levels of nutrients in the water most often come from agricultural runoff and urban wastewater.

At the end of the monitoring season, lakes are given a TLI grade from ultra-microtrophic (very low nutrient levels) to hypertrophic (saturated) depending on their nutrient levels.

The maps (over page) show the TLI grades for the lakes that form the LWQMN.
For more information go to **www.nrc.govt.nz/lakedata**

Lake monitoring performance targets

Continue to implement and improve a prioritised State of the Environment (SoE) monitoring programme and monitor compliance with, and the effects of, the exercise of resource consents and Regional Plans by:

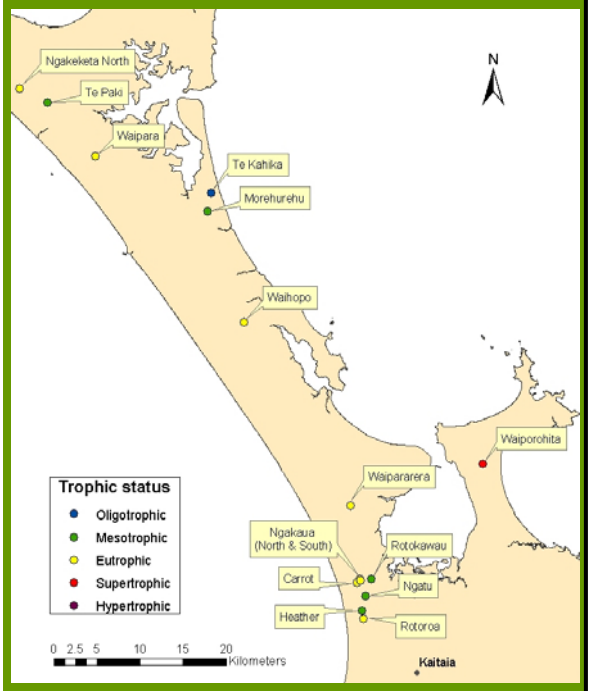
- Operating a region-wide water quality network for the measurement, recording and reporting of river, lake and groundwater quality trends.
- Water quality, weed and algae monitoring of Lake Omapere and associated community liaison and advice, including the ongoing development and co-ordination of a lake catchment management plan.
- Reporting to the Council annually on environmental monitoring activities within three months of the end of the financial year.
- Making the results from the annual SoE monitoring programmes available on the Council's website

www.nrc.govt.nz/soe

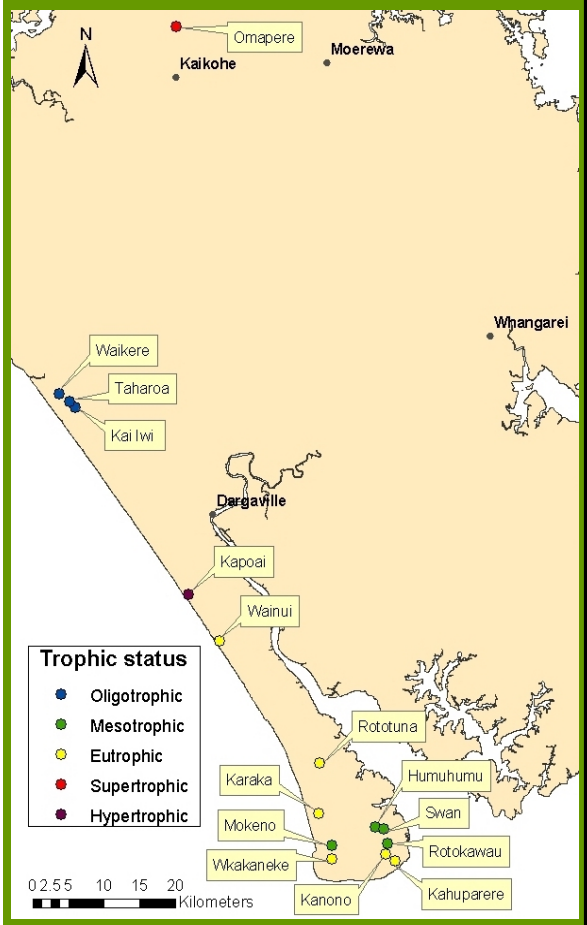
Key points

Of the 30 lakes monitored during 2008-09:

- **4 were graded oligotrophic (low nutrients)**
- **9 were mesotrophic (medium nutrients)**
- **14 were eutrophic (high nutrients)**
- **2 supertrophic (very high nutrients)**
- **1 was graded hypertrophic (saturated)**
- **2 lakes have declined in water quality since 2007-08 — Ngakapua North and Waipara (both are mesotrophic to eutrophic status)**
- **1 lake has improved water quality since 2007-08 — Whakaneke (hypertrophic to eutrophic)**
- **Changes are most likely due to natural nutrient cycles in each lake.**



TLI grades for the Aupōuri and Karikari lakes in the LWQMN.



TLI grades for the Poutō and Central lakes in the LWQMN.

For more information on the lakes in the Council's monitoring network go to

www.nrc.govt.nz/lakedata

Ecological monitoring

In addition, ecological monitoring is undertaken of 82 lakes in the region, on a rotational basis (a selection of these lakes is surveyed each year), by the National Institute of Water and Atmospheric Research (NIWA). In 2008-09, six lakes were monitored as part of this programme.

Lakes in the programme are ranked according to their ecological value, i.e., how many native or endangered plant and animal species they contain, the absence of pest species and how close the lake is to its natural state. Of the 82 lakes in the programme, 30 are ranked as having low value, 21 as having moderate value, 14 high value and 17 are ranked as having outstanding value.

Pest plant surveillance

As recommended by NIWA, ongoing pest plant surveillance was carried out at eight at-risk, high priority lakes in the region during 2008-09.

In May 2009, grass carp were released into Lake Swan on the Pouto peninsula. These fish eat the pest plant Hornwort and it is hoped they will help to eradicate this pest species from the lake. Lake Swan is the only lake on the Pouto peninsula to have this pest plant so it is vital to control Hornwort before it spreads to other neighbouring, high value lakes.

Children help release grass carp at Lake Swan. The local iwi and school attended the release of 850 of the fish.

Lake Ōmāpere

Lake Ōmāpere is located north of Kaikohe and feeds the Utakura River, which flows into the Hokianga Harbour. Water quality in the lake is poor and the lake is prone to blooms of toxic algae, which affect downstream water quality. The Council and local community have been working closely together for the last two decades to improve water quality in the lake, through active management and regular monitoring.

Over the past year, there has been a decline in algae and nutrient levels and an increase in water clarity in Lake Ōmāpere. The TLI grade for Lake Ōmāpere was 5.32 this year, which is significantly lower than the previous year's grade of 5.98. These are all good signs, however it is still too early to tell if the improvements are permanent.

Lake Ōmāpere