Rotorua Te Arawa Lakes Health Summary 2024/2025

Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Trust.
Working as one to protect out lakes with funding assistance from Ministry for the Environment

Lake Statistics (Water Quality Attributes)

Lake	Trophic Level Index		National Policy Statement for Freshwater Management (NPS-FM) Lakes Attributes 2024/25				10 Year Trends (Very Likely Improving; Likely Improving; Indeterminate/Uncertain; Likely Worsening; Very Likely Worsening)				Contact Recreational Attributes		
	TLI 2024/25 (TLI Target)	TLI 3 Year Average	Total Nitrogen Median	Total Phosphorus Median	Chl-*a* Median	Chl-*a* Max	Total Nitrogen	Total Phosphorus	Chl-*a*	Water Clarity	Blue-green health warning	Cyano-bacteria Biovolumes 2022-25	Swimming water quality – faecal[1]
Ōkāreka	3.1 (3.0)	3.1	B	A	B	B					*NA*	*NA*	Fair
Okaro	4.7 (5.0)	4.5	C	C	C	D					No	D	Good
Ōkataina	2.6 (2.6)	2.7	A	A	A	A					*NA*	*NA*	*NA*
Rerewhakaaitu	3.7 (3.6)	3.8	B	B	B	B					*NA*	*NA*	Good
Rotoehu	4.2 (3.9)	4.3	B	C	C	D					Yes	D	Good
Rotoiti	3.8 (3.5)	3.8	B/B	C/C	C/B	C/B					Yes	B	Excellent
Rotokakahi*	*NA (3.1)*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Rotomā	2.5 (2.3)	2.6	A	A	A	A					*NA*	*NA*	Good
Rotomahana	3.6 (3.9)	3.8	B	C	B	B					*NA*	*NA*	*NA*
Rotorua	4.3 (4.2)	4.3	B/B	B/B	C/C	C/C					Yes	C	Poor
Tarawera	2.8 (2.6)	2.9	A	B	A	A					No+	*NA*	Excellent
Tikitapu	2.8 (2.7)	2.9	B	A	B	A					*NA*	*NA*	Excellent

*Italicised figures are based on Te Wairoa Stream monitoring and a three-parameter TLI (no Secchi disk).
[1] NPS-FM Human contact attribute based on 95 percentile *E. coli* over the most recent five bathing seasons. The lowest (worst) grade is shown where lakes have more than one bathing site.
+ Lake Tarawera is not routinely monitored, however ad-hoc samples collected in response to public concern, has resulted in health warnings in past seasons.

What is The Trophic Level Index?

The Trophic Level Index is a number used to indicate the health of lakes in New Zealand. As a general rule of thumb the higher the number, the worse the water quality in the lake.

The number is calculated using four separate water quality measurements – total nitrogen, total phosphorous, water clarity, and chlorophyll-*a*.

National Policy Statement for Freshwater Attributes

To protect ecosystem and human health, attributes are measured to help determine the extent to which specific values are provided for. There is a range of different physical, chemical, microbiological and ecological attributes, and one attribute may apply to more than one value.

Attributes are graded A-D (E), with the National Bottom Lines set for some attributes. 'A' indicated ecosystems are healthy and resilient, or low risk to human health; to 'D' aquatic communities are in a persistent degraded state, or risk to human health from contact recreation is high.

Contact Recreation

Bathing and contact recreation sites are monitored during Summer throughout the Rotorua Lakes, to inform the public when and where it is safe to interact with the water. Not all lakes, or all bathing sites can be monitored, so popular and culturally significant sites are prioritised. Sites can be graded from Poor to Excellent based on attribute statistics in the National Policy Statement for Freshwater (NPS-FM).

Cyanobacteria are monitored in lakes with a history of algal bloom activity. Health warnings are issued by Toi Te Ora based on the volume of potentially harmful cells in the water, and sites are graded according to the NPS-FM.

A	Excellent
B	Good
C	Fair/Moderate
D	Poor

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Lake Statistics (Ecological Attributes)

Lake	Lake Submerged Plant Index[1]				Kōura			Kākahi		Catfish	
	LakeSPI	LakeSPI Native Index	LakeSPI Invasive Index	Invasive Submerged Plants Present	Abundance	Trend	Reason for Change	Abundance	Trend	Abundance	Trend
Ōkāreka	High	B	B	d	Moderate		N/A	Present		Absent	N/A
Okaro	High	C	B	c	Present	[2]	Artifical reef	Absent	N/A	Absent	N/A
Ōkataina	High	B	C	d	Abundant		N/A	Present		Absent	N/A
Rerewhakaaitu	Moderate	C	C	b, d	Present		N/A	Present		Absent	N/A
Rotoehu	Poor	C	D	a, c, e	Present		Declining water quality	Moderate		Absent	N/A
Rotoiti	Moderate	C	C	a, b, c, d, e	Moderate		Catfish predation	Abundant		Abundant	
Rotokakahi*	Moderate	C	C	c	Moderate		N/A	Abundant		N/A	N/A
Rotomā	High	B	C	d	Abundant		N/A	Abundant		Absent	N/A
Rotomahana	Moderate	C	C	a, b	Absent	N/A	N/A	Absent	N/A	Absent	N/A
Rotorua	Moderate	C	C	b, c, d	Moderate		Catfish predation	Abundant		Abundant	
Tarawera	Moderate	C	C	a, b, c, d, f	Abundant		Unknown	Moderate		Absent	N/A
Tikitapu	High	B	C	d	Present		Recovering	Absent	N/A	Absent	N/A

Trend Key
- Improving
- Stable
- Worsening

[1]*based on LakeSPI survey data collected between2018 anc 2023.*
Invasive Submerged Plants: a) *Ceratophyllum*; b) Egeria; c) Elodea; d) Lagarosiphon; e) *Potamogeton crispus*; f) *Ranunculus trichophyllus*
[2]Artificial reef structure has been installed in Lake Okaro as Kōura habitat. There is not enough information to determine a population trend at this time.

Lake Submerged Plant Index (Lake SPI)

The LakeSPI programme monitors macrophytes (aquatic plants) which are used to classify the ecological condition of lakes. The ecological status of a lake can be characterised by the composition of native and invasive plants.

'LakeSPI' index is a synthesis of components from both the native condition and invasive impact condition of a lake, and provides an overall indication of lake condition. The higher the score the better the condition. Monitoring undertaken by Earth Sciences NZ (formerly NIWA).

Kōura and Kākahi Monitoring

Kōura and Kākahi monitoring is carried out by Dr Ian Kusabs of Kusabs and Associates Ltd. Kōura monitoring is undertaken on all the Rotorua Te Arawa Lakes.

Regular kākahi monitoring surveys are undertaken in Lakes Rotorua and Rotoiti to monitor the long-term effects of lake restoration initiatives on kākahi populations in the shallow littoral zone of these lakes.

Catfish Monitoring

Catfish were first detected in Lake Rotoiti in March 2016 and in Lake Rotorua in December 2018. Surveys have been undertaken to detect their presence in the other lakes. So far they are limited to these lakes.

LakeSPI / Cultural / Catfish	
A	Excellent/Abundant/Absent
B	High/Moderate/Present
C	Moderate/Present/Common
D	Poor/Absent/Abundant

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