

Poutō Peninsula

Rototuna (Poutō), NRC Lake No. 328.



Rototuna. Viewed from the south. Photo: Lisa Forester, NRC (4 May 2018).

Summary

Surveyed 2005, 2007, 2012, 2014 and 2018.

Overall ranking

High-Moderate: A lake with retired margins, native vegetation, endangered biota previously recorded and pest fish. Water level and water quality have declined over the past decade but improving catchment and emergent vegetation result in a similar lake ecological value.

Threats

A lowering water level and declining water quality, with regular heavy algal blooms, threaten the lake's ecology. Invasive submerged weeds would displace the existing vegetation, though access is now more difficult. The invasive reed sweet grass (*Glyceria maxima*) threatens the lake margins. Grey willow (*Salix cinerea*) was recorded here (and in Northland) for the first time in 2018.

Management recommendations

Address water level and nutrient concerns. Lake ecological assessment every 5 years. Eradicate reed sweet grass and grey willow.

Description

Rototuna is a dune lake 6 ha in area and 5.1 m deep, depending on water levels. The catchment was pasture (now mostly planted with native species) and pine plantation forestry. Ninety percent of the lake margin has been fenced since 1999 and native vegetation or a thick mat of kikuyu (*Cenchrus clandestinus*) surrounds the lake. There were no inflow or outflow streams. The lake is adjacent to Poutō Road, accessible with a 4-WD.



Google Earth images of Rototuna in 2004 and 2017. Note the establishment of native vegetation in the catchment and increased emergent vegetation.

Wetland vegetation

About 90% of the shoreline had emergent species with raupo (*Typha orientalis*), *Eleocharis sphacelata*, *E. acuta*, *Machaerina articulata* and *Schoenoplectus tabernaemontani* forming a 10 m wide band. *E. sphacelata* beds extended to 1.2 m deep, the other species were < 0.5 m. The invasive reed sweet grass (*Glyceria maxima*) was found for the first time in 2007. It was located amongst raupo on the south-eastern shore of the lake and was still present in 2018. A few small shrubs of grey willow (*Salix cinerea*) were noted amongst planted vegetation near the Poutō Road for the first time in 2018.

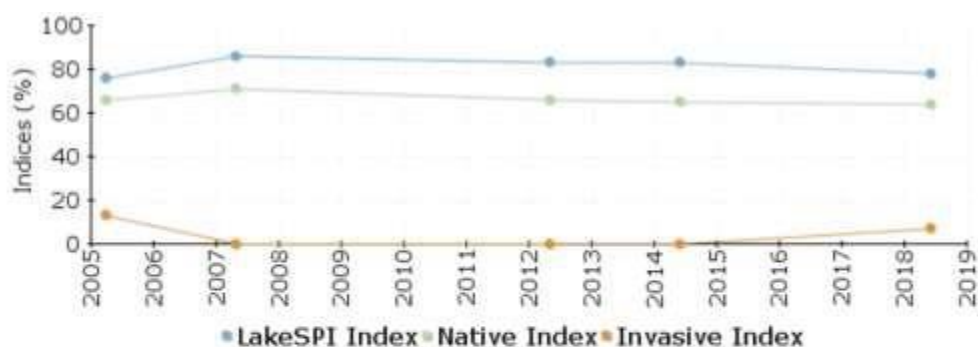
Submerged vegetation

Turf species were present around about 20% of the lake, with *Glossostigma elatinoides* and *Lilaeopsis novae-zelandiae* most common but always at low covers (<26%). Past surveys have been difficult with heavy algal blooms and low visibility (0.4 m in 2012). Charophytes were the dominant vegetation in the lake, with *Nitella* sp. aff. *cristata* at high (>75%) average cover at all profiles and growing to a depth of 3.1 m in 2014. *Chara australis* was also present, but *Nitella pseudoflabellata* and *N. hyalina* were not recorded in 2014. Tall-growing native species were present on all profiles with *Potamogeton ochreatus*, *P. cheesemanii* and *Myriophyllum triphyllum* the most abundant (0-5% median cover). The At Risk Naturally Uncommon *Stuckenia pectinata* was recorded in 2005 but has not been found since. No tall-growing exotic species were present except *Potamogeton crispus* and *Juncus bulbosus*, found in 2005, but they have not been seen since.

In 2018, submerged vegetation extended from the margin of emergent plants to a maximum depth of 3.3 m. The turf species were restricted to the remaining grazed lake margin (~130 m). Composition of the submerged vegetation was similar to previous surveys, although both *Nitella pseudoflabellata* and *N. leonhardtii* were recorded, and *Myriophyllum propinquum* was noted in submerged vegetation, but *M. triphyllum* was not seen. No introduced species were recorded, apart from *Utricularia gibba*, present in only one profile to a depth of 1.4 m.

LakeSPI

Lake Rototuna Submerged Plant Indicators



Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
May 2018	Excellent	78%	64%	7%
May 2014	Excellent	83%	65%	0%
April 2012	Excellent	83%	66%	0%
April 2007	Excellent	86%	71%	0%
March 2005	Excellent	76%	66%	13%

Rototuna is categorised as being in 'Excellent' condition with a LakeSPI index of 78%. LakeSPI values for this lake have remained stable since surveys began in 2001 with only a small change noted in the invasive impact scores during the 2001 and 2005 surveys on account of *Potamogeton crispus* and *Juncus bulbosus* being present at that time and the minor impact of *U. gibba* in 2018.

Water birds

The regionally significant dabchick (*Poliiocephalus rufopectus*) and scaup (*Aythya novaezeelandiae*) were noted in previous visits, with 18 other common birds, the most dominant being black swans (*Cygnus atratus*) and paradise shelduck (*Tardorna variegata*). In addition to the two regionally significant birds, an endangered Australasian bittern (*Botaurus poiciloptilus*) was seen during the 2012 and 2014 visits.

Fish

Nationally threatened inanga (*Galaxias maculatus*) were recorded by the NIWA FBIS database although none were seen during the survey. Common bully (*Gobiomorphus cotidianus*) and exotic *Gambusia affinis* were observed. Rudd (*Scardinius erythrophthalmus*) were also reported.

Aquatic invertebrates

The introduced snail *Physa acuta* was recorded during the vegetation survey.

Endangered species

No threatened plant, fish or aquatic invertebrate species were observed in 2018, but there were records of dwarf inanga (*Galaxias gracilis*) in the lake in the past. This species is now considered to be indistinct from inanga (*Galaxias maculatus*), a species classified as At Risk Declining.

Lake Ecological Value

Rototuna ecological value rating is assessed as 8 “High to Moderate”, an increase from Moderate in 2014. The increase results from the improved condition of the catchment and established emergent vegetation, which countered declining water level and water quality over the past decade.

Threats

A lowering water level and nutrient-enriched water quality, with regular heavy algal blooms, threaten the lake’s ecology. Rototuna has experienced a steady fall of water level, with an estimated loss of 2.74 m since 2004. There was also an apparent earlier level drop in excess of 1 m when the lower Rototuna lake blew out during a storm in the late 1990s (L. Forrest pers. comm.). The lake was supertrophic on two occasions (2013 and 2016), but TLI of <6 have been calculated since (now eutrophic).

The submerged vegetation is dominated by native species and introduction of other weed species is a risk. Invasive submerged weeds would displace the existing vegetation, though access is now more difficult. The invasive reed sweet grass (*Glyceria maxima*) threatens the lake margins. New Zealand’s worst wetland weed grey willow (*Salix cinerea*) was found for the first time in Northland at Kaihu on 3 May 2018, with the discovery of plants at Lake Rototuna the following day. They have since been removed.

Management recommendations

Lake ecological assessment every 5 years. Eradicate reed sweet grass and grey willow from the lake margins. A grass-specific herbicide such as haloxyfop is recommended for the grass, with minimal impact on sedges and raupo expected.

Fish surveys and water quality monitoring are both advocated.