

Poutō Peninsula

Lake Humuhumu (Poutō), NRC Lake No. 350.



Humuhumu. A pastoral catchment (foreground) and harvested pine plantation (background).

Summary	Humuhumu
Surveyed:	1984, 1985, 1988, 2001, 2005, 2007, 2012, 2014, 2017 and 2021.
Overall ranking:	Outstanding: A large, relatively deep, clear lake with diverse biota including nationally rare plants, fish and birds, with no major pest species.
Threats:	High risk of introduction and establishment of invasive pests. High risk of nutrient enrichment from pine plantation activities (harvesting and fertilisers) and nutrient run-off from farmland. Indicators of recent improved lake condition due to fencing and riparian management.
Management recommendations:	Lake ecological assessment monitoring every 5 years.

Description

Humuhumu is a large (139.4 ha) dune lake (1700789E, 5979177N) with a maximum depth of 16 m. The lake has a predominantly pastoral catchment with scattered pockets of manuka and kanuka scrub, except for the western shore, which is comprised of sand dunes with pine forest. A large island with indigenous vegetation divides the lake into two basins. There are no inlet or outlet streams. The lake is easily accessed from the roadway across firm grassed ground, but the previous boat launch site has been closed off by raupō growth. Alternative access is possible on private property.

Wetland vegetation

About 70% of the shoreline had a (c. 15 m) band of emergent species extending into about 1 m depth of water. *Schoenoplectus tabernaemontani* and *Eleocharis acuta* were the most common species, with raupō (*Typha orientalis*), *Apodasmia similis*, *Bolboschoenus fluviatilis*, *Cyperus ustulatus*, *E. sphacelata*, *Juncus pallidus*, *Machaerina articulata*, *M. arthropphylla*, and *M. juncea* also present. The invasive exotic, alligator weed (*Alternanthera philoxeroides*) was present in the marginal vegetation on the north-east shore and the invasive royal fern (*Osmunda regalis*) was also recorded (B. Searle pers. comm.).

Submerged vegetation

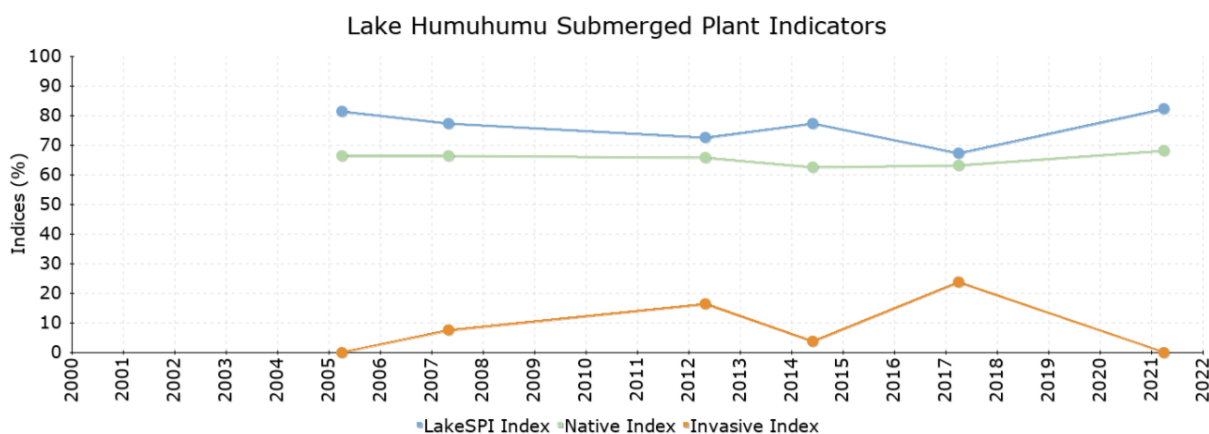
Turf plants were common where not displaced by dense emergent vegetation, with *Lilaeopsis ruthiana*, *Myriophyllum propinquum*, *M. votschii* and *Glossostigma elatinoides* the dominant turf species, with the charophyte *Nitella hyaline* also common in this vegetation..

In 2021, the submerged vegetation was dominated by *Chara globularis* and *Chara australis* at high covers with some tall-growing natives commonly *Myriophyllum triphyllum*, *Potamogeton cheesemanii* and *P. ochreatus*. *Chara australis* formed the deepest growing vegetation, extending to 9.7 m, with meadows of this species down to 9.1 m. No non-native species were recorded. *Stuckenia pectinata* was also recorded but not on the transects surveyed.

A similar submerged vegetation was recorded in 2017, but this only extended to 7.6 m. Two introduced species, *Otellia ovalifolia* and *Potamogeton crispus* had been recorded, but were assessed to have little consequence to native biodiversity. Localised impacts had occurred from *Utricularia gibba*, a species not recorded in 2021.

The vegetation pattern has changed over the years since 1985. *Nitella* sp. aff. *cristata* was dominant until 1985, then *Chara australis* increased in abundance in 1988 to become the dominant plant in 2005 with *Chara globularis*. The presence of *N.* sp. aff. *cristata* has decreased to low covers, occurring in only one profile in 2007 and it has not been recorded since. Maximum vegetation depth limits were 9 – 10 m in the 1980's but had reduced to 7.6 m with lower plant cover than previous years. Increased benthic cyanobacterial mat cover was also noted from 2014 onwards. In 2021, maximum depths of 9.7 m were recorded indicating an improved ecological condition of Humuhumu even though water clarity was poor (< 1m visibility) at the time of survey.

LakeSPI



Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
March 2021	Excellent	82.2%	68.0%	0.0%
March 2017	High	67.1%	63.2%	23.7%
May 2014	Excellent	77.3%	62.4%	3.7%
April 2012	High	72.4%	65.6%	16.3%
April 2007	Excellent	77.3%	66.4%	7.4%
March 2005	Excellent	81.3%	66.4%	0.0%

The 2021 LakeSPI Index shows a lake in excellent ecological condition with a LakeSPI index of 82%, a significant improvement from 2017. This reflects the extent of native submerged vegetation with charophyte meadows growing deeper in the lake with no introduced species recorded.

Water birds

The lake provides significant bird habitat with abundant water birds noted on the lake in 2017 including black swan (*Cygnus atratus*), Canada geese (*Branta canadensis*), paradise shelduck (*Tadorna variegata*), scaup (*Aythya novaezeelandiae*), 31 dabchick (*Poliiocephalus rufopectus*) and two shag species (*Phalacrocorax* spp.). The threatened birds, bittern (*Botaurus poiciloptilus*) and Caspian tern (*Hydroprogne caspia*) are commonly seen at this lake, with bittern being present here at higher numbers than the more isolated Mokeno (Andrew Knock, DOC, pers. comm. 2021) on previous visits. OSNZ also recorded the regionally significant fernbird (*Bowdleria punctata vealeae*) and spotless crane (*Porzana tabuensis plumbea*).

Fish

The common bully (*Gobiomorphus cotidianus*) was most commonly seen. Īnanga (*Galaxias maculatus*), were also common, being observed on most profiles in the shallows and during weed surveillance monitoring. No introduced fish species were recorded.

Aquatic invertebrates

Nine invertebrates have been recorded including koura (*Paranephrops planifrons*) and freshwater mussels (*Echyridella menziesii*) and the snail (*Glyptophysa variabilis*). Freshwater jellyfish (*Craspedacusta sowerbyi*) medusae were present in the lake.

Endangered species

The Nationally Critical *Trithuria inconspicua* has not been found since 2012. A survey to ascertain the status of this plant in Lake Humuhumu is recommended. The Nationally Vulnerable *Lepilaena bilocularis* was reported in 2001 but the specimen held at the Auckland Herbarium (AK) was subsequently determined to be *Ruppia polycarpa* (by P Champion). In 2012, the uncommon fern *Thelypteris confluens* (At Risk – Naturally Uncommon) was found on the lake margin in two localities. The Poutō Peninsula is the national stronghold for this species.

A lake-locked population of the At Risk Declining inanga (*Galaxias maculatus*), formerly recognized as a different species (*G. gracilis*) restricted to the Poutō lakes, remains abundant in Humuhumu with schools of this fish commonly seen during dive surveys.

The At Risk Declining torewai (freshwater mussels) and Data Deficient *Glyptophysa variabilis* were both abundant in the lake.

Lake Ecological Value

Previously, Humuhumu showed indicators of nutrient enrichment with extensive cyanobacterial mats, receding macrophyte bottom limits, change in charophyte species dominance and declining charophyte cover occurring. These trends have apparently reversed, with a 2021 condition similar to that in 2005, although cyanobacterial mats were seen on some transects. Water quality trends showed improvement in TLI indicating mesotrophic status (10-year median of 3.64) in 2019, although water clarity was poor in 2021. Humuhumu has an ecological value rating as Outstanding with a score of 16. *Trithuria inconspicua* may have disappeared from this lake, with Rotokawau the only remaining Poutō location of this plant.

Threats

This lake has no pest fish; Rototuna with *Gambusia affinis* is the closest threat. No invasive submerged plants were present but invasive species would do well in this lake. Nearby Rototuauru, had presented the most immediate threat as a source of invasive weeds, but the introduction of grass carp for weed control in that lake, has effectively mitigated this threat.

Alternanthera philoxeroides is well established at the southern end of Humuhumu.

Forest harvesting may have a major influence on this lake.

Management recommendations

Five yearly lake ecological monitoring is recommended.