Te Hiku

Lake Wahakari, NRC Lake No. 35.

Lake Wahakari: The lake margin looking westward (Svenja David, 2025).

Summary	Lake Wahakari
Surveyed:	2004, 2008, 2013, 2015, 2021 and 2025.
Overall ranking:	**Outstanding**: Well-developed and diverse emergent and submerged vegetation with some endangered biota, including the only known Northland population of *Isolepis lenticularis*. The pest species *Utricularia gibba* and *Gambusia affinis* were present.
Threats:	Introduction of further invasive species, especially hornwort which is present in nearby lakes. Harvesting of pine trees occurred in the catchment in 2021 to 2023, with an increase in tannin staining and the next rotation of trees is now well established. *Isolepis lenticularis* is susceptible to decreasing water quality.
Management recommendations:	Warn landowners of the risk posed by new weed incursions. Discuss the impacts of pine harvesting on lake ecology with forestry owners Undertake a delimiting survey for *Isolepis lenticularis.* Lake ecological condition monitoring every 5 years.

Description

Lake Wahakari (1592960E, 6165597N) is a large (84.4 ha) lake with a maximum depth of 12.5 m. The lake is ponded between dunes to the west and weathered hill country, with heavy clay soils, to the east. The catchment is primarily plantation pine forestry (50%), with the western end of the lake harvested in 2021 to 2023, mānuka / kānuka scrub (40%) and fenced pasture (10%). There is an inflow at the north-western end of the lake, apparently surrounded for much of its 3 km length by wetland vegetation. The outlet at the south-eastern end passes through a raupo/flax swamp and discharges into Parengarenga Harbour via the Te Kao Stream. Access is now (2014 onwards) from Oromanga Road, off Te Ahu Road. There is no public access to the lake, which serves as a water supply to Te Kao.

Wetland vegetation

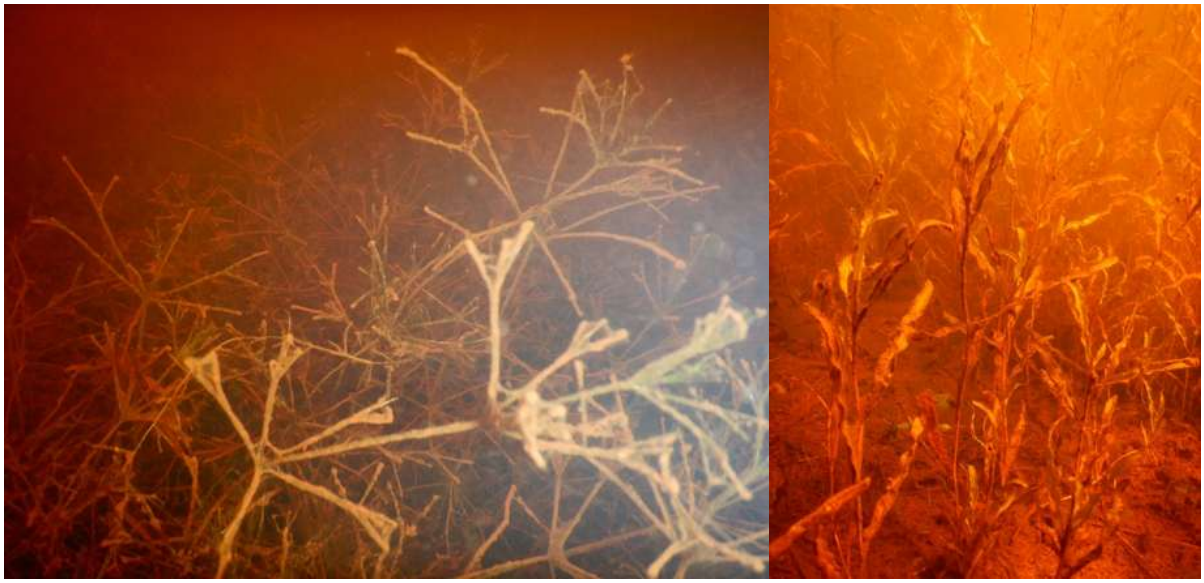
Most of the lake margins have beds of emergent species of up to 10 m wide growing from the lake margin to 1.3 m depth. The dominant emergent species were kuta (*Eleocharis sphacelata*), *Eleocharis acuta,* oioi (*Apodasmia similis*), *Machaerina juncea, M. arthrophylla, M. articulata, M. rubiginosa*, *Schoenoplectus tabernaemontani* and raupō (*Typha orientalis*). In 2013, maru (*Sparganium subglobosum*) was found in a grazed wetland adjacent to emergent beds.

Submerged vegetation

In 2025, a diver survey of five LakeSPI sites was undertaken to depths of 5 to 7 m. They described underwater visibility as being poorer than previous visits. However, a very diverse mosaic of macrophyte species was present in the shallows (≤ 2 m), with charophyte meadows growing deeper (up to 4.3 m) and scattered plants to a maximum depth of 6.4 m, possibly a remnant of deeper meadows. There were comparatively lower plant covers at the two western sites. Turf communities were sparse due to extensive and dense emergent beds. Shallow water species included *Lilaeopsis novae-zelandiae, Juncus bulbosus, Utricularia gibba, Myriophyllum propinquum, Potamogeton cheesemanii, P. ochreatus* and the charophytes *Nitella* sp. aff. *cristata*, *N. leonhardii, N. muscosa, N. hyalina, Chara australis,* and *C. acanthopitys. Nitella* sp. aff. *cristata, P. ochreatus* and *U. gibba* grew deeper than 4 m at one or more sites.

Isolepis lenticularis was found adjacent to the boat access point associated with the emergent *Machaerina juncea.*

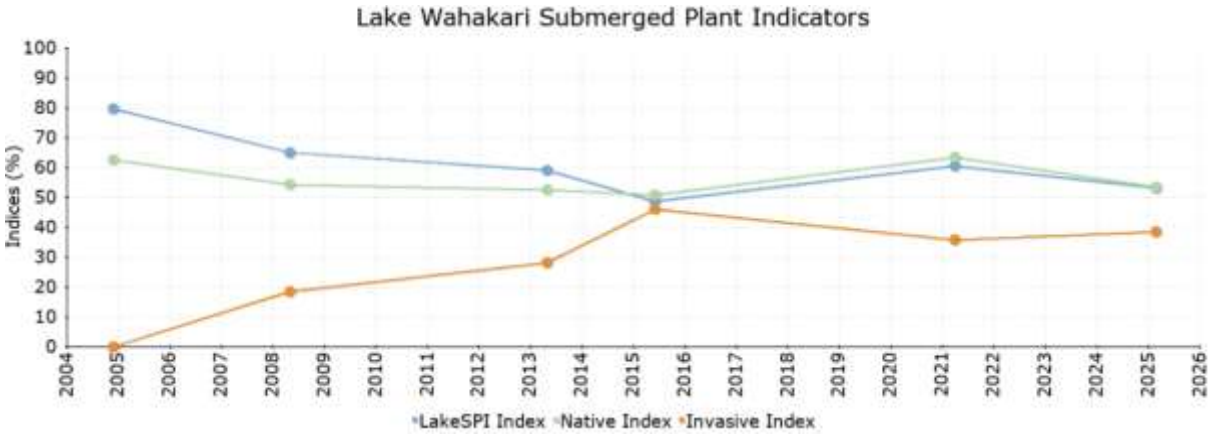
In 2004 (and previous visits), submerged vegetation extended to more than 7 m depth, but since that time, depth limits have become shallower.



Lake Wahakari: *Nitella* sp. aff. *cristata* (left) and *Potamogeton cheesemanii* (right) (Mary de Winton, 2025).

Lake Wahakari: *Isolepis lenticularis* submerged amongst emergent vegetation (Marley Ford, 2025).

LakeSPI



Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
February 2025	High	53.2%	53.3%	38.5%
March 2021	High	60.5%	63.3%	35.6%
May 2015	Moderate	48.6%	50.8%	45.9%
April 2013	High	59.1%	52.5%	28.1%
April 2008	High	65.0%	54.2%	18.5%
November 2004	Excellent	79.5%	62.5%	0.0%

In 2025, a **high** LakeSPI Index of 53.2% was calculated. All three LakeSPI indices had significantly deteriorated from 2021, but were significantly better than in 2015. An **excellent** LakeSPI Index of 80% in 2004 reflected an abundant and diverse cover of indigenous plants extending to more than 7 m deep. This lake is heavily impacted by the invasive bladderwort with an Invasive Impact Index between 35.6 and 45.9% in the last three visits, with declining water clarity likely responsible for the shallower maximum vegetation depths.

Water birds

Extensive emergent vegetation and a relatively isolated lake provides good habitat for water birds. In 2025, 7 New Zealand dabchick (*Poliocephalus rufopectus*), 25 Canada goose (*Branta canadensis*), 3 paradise shelduck (*Tadorna variegata*), 1 black shag (*Phalacrocorax carbo novaehollandiae*) and 2 pied shag (*Phalacrocorax varius*) were recorded. Previously, fernbird (*Poodytes punctata vealeae*), scaup (*Aythya novaeseelandiae*), mallard duck (*Anas p. platyrhnchos*) and black swan (*Cygnus atratus*) were observed or heard in 2015.

Fish

A fish survey undertaken in 2025 recorded 583 common bully (*Gobiomorphus cotidianus*) ranging in length between 49-58 mm, one 33 mm long Cran's bully (*Gobiomorphus basalis*), 13 longfin eel (*Anguilla dieffenbachii*) ranging in length between 420-990 mm (maximum weight of 3.89 kg), 12 shortfin eel (*Anguilla australis*) ranging in length between 290-710 mm and 300 alien invasive gambusia (*Gambusia affinis*). NIWA Freshwater Fish Database also recorded smelt (*Retropinna retropinna*) in this lake but they have not been recorded during the lake ecological surveys.

Lake Wahakari: Longfin eel (*Anguilla dieffenbachii*) captured on the fish survey (Katrina Hansen, 2025).

The Golden Bell frog (*Ranoidea aurea*) was reported as common in the lake margins in previous ecological surveys.

Aquatic invertebrates

Torewai / freshwater mussels (*Echyridella menziesi*) were abundant throughout the lake including below the vegetated zone. Freshwater sponges were commonly seen and 97 freshwater shrimp (*Paratya curvirostris*) were caught during the fish survey. Kēwai / freshwater crayfish (*Paranephrops planifrons*) were recorded on previous surveys.

Lake Wahakari: Sponges on dead submerged bases of emergent plants (Mary de Winton 2025).

Endangered species

This lake contains possibly the only regional population of the At-Risk Declining *Isolepis lenticularis*. This species was found at three sites in 2013, but otherwise has only been found at the southeastern site, being first recorded there in 2001 (Champion et al. 2002). Other At-Risk Declining species included longfin eel (*Anguilla dieffenbachii*) and torewai (*Echyridella menziesi*), with longfin eels recorded for the first time.

Nationally Increasing New Zealand dabchick (*Poliocephalus rufopectus*) were recorded from the 2025 bird survey. Two At Risk shag species were also observed; black shag (*Phalacrocorax carbo novaehollandiae*; Relict) and pied shag (*Phalacrocorax varius*; Recovering).

The Nationally Critical *Utricularia australis* has not been seen since 2008 and is apparently now extinct in this lake.

Lake Ecological Value

In 2025, an Ecological Value rating of **Outstanding** was calculated for Lake Wahakari, with a score of 15. This rating was also assigned in 2015, with the following differences:

- *Isolepis lenticularis* was classified as Nationally Critical in 2017 (de Lange et al. 2018), now regarded as At-Risk Declining (de Lange et al. 2024). Endangered Species score was adjusted from 5 to 2 for this species.
- At-Risk Declining longfin eel were recorded for the first time in 2025. Addition of this to the calculation of Endangered Species score compensated for the decline discussed in the bullet point above.
- Underwater visibility had declined with increased tannin-staining noted in 2025. The decline could be linked to forestry harvesting in the western catchment in 2021 to 2023. However, water quality has remained at Mesotrophic with a TLI of 3.5.

Threats

Road access to the lake is restricted and on private land, although there is access at the southern end for waka ama. If introduced, submerged pest plants such as hornwort (*Ceratophyllum demersum*), present in the nearby Lake Kihona, would have a major impact on the submerged biota of Lake Wahakari. The pest fish *Gambusia affinis* may have a deleterious impact on native fish (Collier and Grainger 2015).

Reducing submerged native plant cover and a reduction in maximum depth limits signal concerns for this lake's deteriorating condition. Harvesting of pine trees in the catchment may have led to increased tannin staining, with decreased underwater light penetration. The lower plant covers reported at the two western sites may relate to adjacent pine harvesting activities.

Isolepis lenticularis is particularly sensitive to decreasing water quality and has been lost from most lowland water bodies in the North Island. While the lake is still mesotrophic, any future decline could impact the survival of this species in Northland.

Management recommendations

Ensure local landowners and recreational lake users are aware of the risk posed by aquatic weed introductions..

Discuss the impacts of pine harvesting on the ecology of Lake Wahakari with forestry owners and suggest more sensitive planting set-backs to protect the lake and associated wetlands.

Undertake a delimiting survey for *Isolepis lenticularis* in the emergent and shallow (<3 m deep) water zone. Carry out lake ecological condition monitoring every five years.

References

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