Te Hiku

Lake Waiparera, NRC Lake No. 102.

Lake Waiparera: Boat access point, note the invasive giant reed (*Arundo donax*) on the left and alligator weed (*Alternanthera philoxeroides*) on the right (Svenja David, 2025).

Summary	Lake Waiparera
Surveyed:	2005, 2010, 2016, 2017, 2020 and 2025.
Overall ranking:	Moderate: Largest of the Te Hiku lakes. Submerged vegetation has collapsed. Good water bird habitat and threatened marginal plants and fish potentially still present.
Threats:	A combination of deteriorating water quality and a past increase in dominance of egeria has resulted in collapse of the submerged vegetation.
Management recommendations:	Discuss the potential for introduction of torewai to improve water quality with mana whenua. Five-yearly ecological monitoring is recommended to assess potential submerged vegetation recovery. A fish survey and ongoing water quality monitoring are also recommended.

Description

The lake (1616526E, 6133135N) is the largest of the Te Hiku lakes (106 ha) but relatively shallow (6.5 m). This catchment is approximately 70% pasture (mostly fenced) with the remainder in native scrub or wetland. The lake has several inflows, mostly drains on the south western side, but also a drain on the north-western and north eastern shores. There are no obvious outflows. Access for vehicles and boats is easy with a public access off SH 1 to a boat access site from a large grassy area.

Wetland vegetation

Emergent vegetation nearly encircled the lake extending over 10 m wide in many places. Vegetation was dominated by monocultures of: raupō (*Typha orientalis*), oioi (*Apodasmia similis*), *Machaerina articulata, M. arthrophylla, M. juncea,* kuta (*Eleocharis sphacelata*) and *Schoenoplectus tabernaemontani*. In 2025, there appeared to be a die-off of emergent plants in the deeper water, with remnant rhizomes and stems persisting.

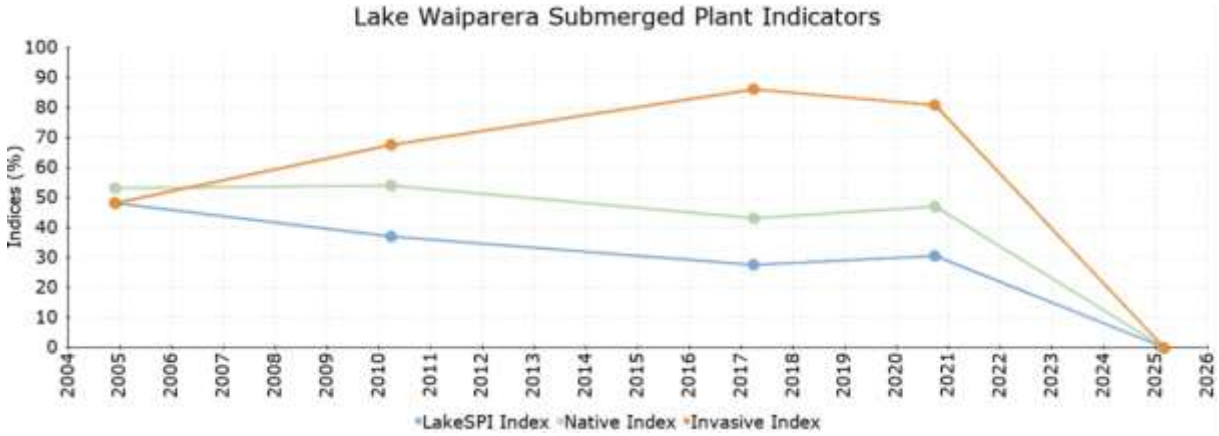
The alien invasive giant reed (*Arundo donax*) was locally established around the boat access point. Another invasive, alligator weed (*Alternanthera philoxeroides*) formed floating mats on the south western shore and appeared to be well established around the lake. No NRC shore-based vegetation survey was undertaken in 2025. One 2 m tall royal fern (*Osmunda regalis*), a major wetland weed, was located at the north western end of the lake amongst mānuka in 2010, the first record of this species north of Kaipara District. It was not found at this site from 2016 onwards and is likely to have been eradicated. Several plants of the endangered fern *Cyclosorus interruptus* were found amongst emergent vegetation.

Submerged vegetation

In 2025, a diver survey of five LakeSPI sites was undertaken to depths of 2.5 to 3.3 m. Lake water clarity was poor (0.4 m) and dark below 2 m. Submerged vegetation was sparse, with none of the five transects supporting vegetation at covers of more than 5%, with the lake classed as non-vegetated according to LakeSPI. The commonest species was the invasive alien egeria (*Egeria densa*), found at all sites from 0.2 to 1.5 m deep, with some lagarosiphon (*Lagarosiphon major*) in shallower water at three sites, hornwort (*Ceratophyllum demersum*) at two sites and *Nitella* sp. aff. *cristata* the sole native species encountered from 1.6 to 1.7 m at one site.

On previous surveys egeria dominated the submerged vegetation from less than 1.5 m deep to just over 4.5 m. Lagarosiphon and hornwort formed low covers from 1 - 3 m. The native *Potamogeton ochreatus* had a similar depth range to the egeria and was the second most abundant plant in the lake. *Chara australis*, *Nitella* sp. aff. *cristata* and *N. leonhardii* were the most abundant charophytes but charophyte meadows were only found at two sites and no deeper than 2 m. Turfs were dominated by *Lilaeopsis novae-zelandiae* with several charophytes including *Chara globularis, Nitella hyalina* predominantly restricted to this vegetation.

LakeSPI



Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
February 2025	Non-vegetated	0.0%	0.0%	0.0%
September 2020	Moderate	30.5%	47.0%	80.7%
March 2017	Moderate	27.5%	43.0%	85.9%
March 2010	Moderate	37.0%	54.0%	67.4%
November 2004	Moderate	48.0%	53.0%	48.1%

A LakeSPI Index of 0% was generated in 2025, as the submerged vegetation did not exceed the cover threshold of 10% and was classed as **non-vegetated**, with a significant decrease in all indices from 2020. Previously, the LakeSPI Index classified the lake in **moderate** ecological condition, with the lake highly impacted by invasive weed species.

The lake has undergone a change of state, flipping from clear water, submerged macrophyte domination, to a turbid algal dominated state.

Water birds

No bird survey was undertaken in 2025, but the dive team noted paradise shelduck (*Tadorna variegata*) and large numbers of little black (*Phalacrocorax sulcirostris*) and pied shag (*Phalacrocorax v. varius*). No black swans (*Cygnus atratus*) were observed, this species being abundant on previous sampling occasions.

Prior to the 2025 visit, the extensive emergent vegetation and fenced areas provided good water bird habitat. Black swan, Canada geese (*Branta canadensis*), paradise shelduck, New Zealand dabchick (*Poliocephalus rufopectus*), scaup (*Aythya novaezeelandiae*), pied stilt (*Himantopus himantopus*) and three shag species (*Phalacrocorax* spp.) were recorded. Fernbird (*Poodytes punctata vealeae*) were heard in the marginal vegetation in 2016. DOC records include the Australasian bittern (*Botaurus poiciloptilus*).

Fish

Previous fish surveys have recorded common bullies (*Gobiomorphus cotidianus*), non-diadromous (lake-bound) īnanga (*Galaxias maculatus*), long and shortfin eels (*Anguilla dieffenbachii* and *A. australis*) and the pest fish *Gambusia affinis* and goldfish (*Carassius auratus*).

Aquatic invertebrates

Prior to 2025, freshwater sponges and the native snail *Potamopyrgus antipodarum* were commonly observed in the lake.

Endangered species

Threatened plants have earlier included the At-Risk Declining fern *Cyclosorus interruptus* and the At-Risk Naturally Uncommon sedge *Fimbristylis velata* but wetlands and marginal vegetation were not surveyed in 2025. The Nationally Critical turf species *Trithuria inconspicua*, was last recorded here in 1993.

Two At-Risk Declining fish īnanga (*Galaxias maculatus*) and longfin eels (*Anguilla dieffenbachii*) are reported from Lake Waiparera.

Two At-Risk shag species were seen in 2025 including Recovering pied shag (*Phalacrocorax v. varius*)

and Naturally Uncommon little black shag (*Phalacrocorax sulcirostris*).

Lake Ecological Value

In 2025, an Ecological Value rating of Moderate was calculated for Lake Waiparera, with a score of 6. This compared to the High rating (score of 10) in 2020, with decreasing Native Aquatic Species Richness, Native Condition Index and Endangered Species scores. Water quality was assessed as supertrophic in 2025 with a TLI score of 5.4, previously being eutrophic from 2020-2022.

Threats

Access to the lake is easy and has resulted in several pest plant incursions in the last 40 years. It is likely that the combination of deteriorating water quality and a previous increase in dominance of egeria resulted in the collapse of the submerged vegetation, similar to that documented in Lake Ōmāpere (Champion 2002). Torewai (freshwater mussels - *Echyridella menziesii*)) are present in Lake Ōmāpere but not known from Lake Waiparera. The impact of these filter feeders on planktonic algae is postulated as a mechanism for improving water clarity and the subsequent re-establishment of submerged vegetation in Ōmāpere.

Royal fern (*Osmunda regalis*) was located at the north western end of the lake amongst mānuka, the first record of this species north of Kaipara District. Department of Conservation was managing this species (G. Williams pers. comm.). This has apparently been a successful eradication, with no plants seen since 2016.

The lake is now fenced and development of riparian and emergent vegetation in formerly grazed lake margins is likely to reduce nutrient inputs, however drains entering the lake provide point sources of nutrients draining from pastoral land.

Management recommendations

Potentially, the introduction of torewai could improve the water clarity in Lake Waiparera, provided approval is given by mana whenua. The closest lakes with sufficiently large populations of these molluscs are Lakes Wahakari and Rotoroa.

Five-yearly ecological monitoring is recommended to assess potential submerged vegetation recovery. A fish survey and ongoing water quality monitoring are also recommended.

References

Champion, P.D. (2002). *Egeria densa* – an alien invasive plant responsible for the devegetation of New Zealand shallow lakes. Proceedings of the Thirteenth Australian Weeds Conference, Perth.126–129.