

Lake Waiporohita

09/02/2026

NRC Lake Number: 99



Ecological Condition: High

Submerged Plant Indices	Score	NPS-FM Attribute band
Native Condition Index	80%	A
Invasive Impact Index	0%	A

Summary

Overall Rank: Waiporohita currently supports a high-condition, fully native submerged macrophyte community with a near-reference LakeSPI score. Despite the excellent macrophyte condition, the lake remains High rather than Outstanding because water quality is still constrained by poor water quality and increasing marginal weed pressure.

Threats: Eutrophic pressure from the surrounding high-producing pastoral catchment and large populations of waterfowls contribute to persistent water quality issues. The major current vegetation threat is the spread of alligator weed and water primrose through the emergent margins and shallow littoral zone. Easy public access also maintains a continuing biosecurity risk for new pest introductions.

Recommendations: Prioritise nutrient reduction and containment of marginal invasive weeds. Increase biosecurity measures such as signage and surveillance. Ongoing monitoring of macrophyte condition, algal biomass, and weed spread remains important.

General description

Lake Waiporohita is a small, shallow lake (6.4 ha) with a maximum depth of 3.5 m, located on the Karikari Peninsula (1631763E, 6137937N). Its shallow morphometry makes the lake inherently sensitive to external nutrient inputs, sediment resuspension through wind, and internal nutrient recycling, increasing its vulnerability to eutrophication.

The lake is situated within a relatively large catchment of 552.61 ha, resulting in a high catchment-to-lake area ratio. Land cover within the catchment is dominated by exotic vegetation (84.62%), with high-producing pastoral land accounting for 84.41% of the total area. This intensive pastoral land use is likely the primary driver of nutrient and contaminant loads entering the lake, particularly nitrogen, phosphorus, fine sediments, and faecal-associated contaminants.

Forestry occupies a very small proportion of the catchment (0.17%), primarily as pockets along the east coast. Native vegetation comprises 14.16% of the catchment and occurs mainly as wetlands and small fragmented blocks of mānuka/kānuka along the catchment boundary. While the remnant native bush blocks provide some localised ecological value, their limited extent and fragmented nature mean they offer minimal buffering capacity at the catchment scale.

Wetlands make up 1.92% of the catchment and are primarily associated with the large coastal complex that runs along the western catchment boundary. This wetland complex is not hydrologically connected to the lake via surface flows. It drains into a separate main stem stream that flows past the lake before discharging to the coast. As a result, the wetland does not function as a nutrient or sediment sink for the lake and provides no effective buffering of contaminant loads derived from surrounding pastoral land. It does however, provide valuable habitat for wetland species that utilise both the lake and coastal environments.

Lake Waiporohita has no defined inflowing streams. Hydrological inputs are dominated by diffuse overland flow, which generally drains from west to east across the catchment. During high rainfall events, this flow pathway facilitates the direct delivery of nutrients,

sediments, and other contaminants from adjacent pasture into the lake. The riparian buffers offer some contaminant attenuation but cannot mitigate the extent of runoff generated from the largely pastoral catchment.

The combination of intensive high-producing pastoral land use, minimal sub-catchment buffering, lack of hydrologically connected wetlands, and the lake's shallow morphology directly contributes to the eutrophic condition of Lake Waiporohita. These factors collectively promote high nutrient loading, reduced water quality resilience, and an elevated risk of algal blooms and ecological degradation.

Wetland vegetation

Emergent wetland vegetation surrounds ~40% of the lake margin, averaging ~8 m wide along the eastern margin and ~20 m wide around the remainder of the lake. A wider emergent band occurs along the western margin, linking the northern corner to a distinct wetland feature in the south-west bay.

The emergent vegetation is dominated by *Typha orientalis* with an outer fringe of *Eleocharis sphacelata*, additional stands of *Schoenoplectus tabernaemontani*, *Eleocharis acuta*, and *Apodasmia similis* are also present amongst the wetland features.

The first record of *Gratiola pedunculata* at this lake was made in 1996 and it has been commonly found since. In 2007, *Alternanthera denticulata* had expanded its range over much of the lake margin. A previously unrecorded rush (*Juncus polyanthemus*) was recognised here in 2009, and the first New Zealand record of *Crassula natans* var. *minus* was made here in 2011. These two vagrant species are now common and are regarded as established at this site.

Alligator weed (*Alternanthera philoxeroides*) and primrose willow / water primrose (*Ludwigia peploides* var. *montevidensis*) form large marginal beds and are widespread within the emergent zone, representing the dominant current ecological pressure on wetland condition. A 2 m² alligator weed patch was noted in 2005 and has increased substantially since. Overall, the wetland retains moderate to high ecological condition but is currently constrained by invasive species development.

Submerged vegetation

Due to persistent algal blooms, 2026 was the first time since 2017 that a submerged plant survey in Lake Waiporohita has been possible. The lake currently supports a high-condition, fully native submerged macrophyte community with a near-reference LakeSPI outcome. The submerged flora is characterised by a mixed charophyte and pondweed assemblage (Video 1) with a shallow turf component in the upper littoral margins (Video 2).



Video 1: Charophyte and pondweed dominated macrophyte assemblage.

Chara australis is a key structural species, recorded broadly from ~0.3 – 2.4 m and forming moderate (25 – 75%) to very high cover beds (95 – 100%) with average heights ranging from 10 - 55 cm. *Potamogeton ochreatus* is a frequent co-dominant species seen across a similar depth range (~0.3 – 2.4 m), reaching ~48 cm tall and ranging from low (6 - 50%) to very high maximum covers (95 – 100%). *Nitella* sp. aff. *cristata* was the only other charophyte species recorded during the survey and was generally confined to ~0.5 – 0.7 m where it achieved maximum covers 26 – 50%. Shallow turf taxa (*Elatine gratioloides*, *Glossostigma elatinoides*) formed discrete beds in the upper littoral zone (0.1 – 0.4 m) zone. The turf cover along the surveyed transects were low (<25%) however, large beds achieving ~75% cover were seen along the eastern lake margin (Video 2). *Potamogeton cheesemanii* and *Myriophyllum propinquum* were also recorded but did not form significant covers.

Although vegetation was recorded down to ~1.8 m, there was pronounced spatial heterogeneity within the lake driven by substrate and littoral configuration. In general, the macrophyte establishment pattern consisted of moderate to high mixed assemblage cover adjacent to the emergent reeds, followed by a 10 – 15 m band of bare substrate, then a narrow muddier band (2 – 5 m) with low to moderate pondweed cover, and then a ~5 m band of higher-cover charophytes. Loose substrates appear to limit deeper establishment, with vegetation not exceeding ~10% cover beyond ~0.8 m in parts of the lake. This distribution indicates the photic zone largely supports native-dominated assemblages and retains intact charophyte beds, although some shoreline reaches appear affected by emergent reed encroachment.

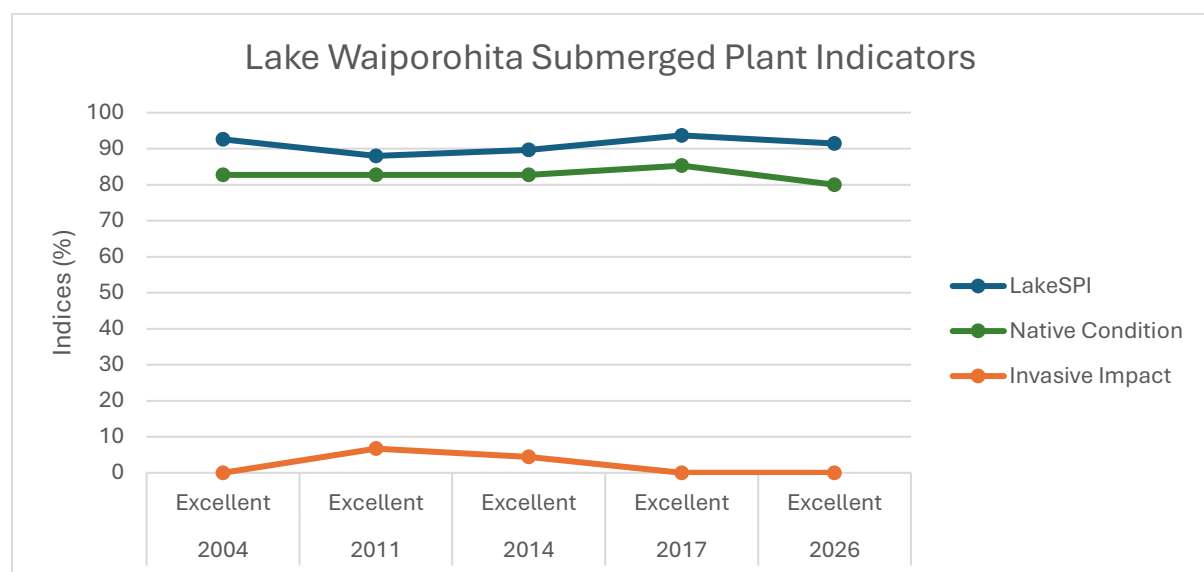


Video 2: Turf communities in the upper littoral zone.

Comparisons to previous assessments indicates long-term persistence of excellent macrophyte condition despite variable water quality conditions. In 2004/2006 the charophyte bottom limit was ~1.5 m, whereas by 2011 and 2014 the lake had improved to be fully vegetated to its deepest point (~3 m). Over that period, the charophyte community shifted from *Nitella* sp. aff. *cristata* toward dominance by *Chara australis*, with *Nitella* last recorded in 2011 (though it reappears as a secondary component in 2026). In 2017, despite extremely low reported clarity (~0.1 m), *Potamogeton ochreatus* and *Chara australis* still dominated and vegetation extended to 2.9 m. This was indicative of the macrophyte resilience under poor photic conditions at the survey time but also emphasised the ongoing vulnerability to bloom-driven shading. Small amounts of

Utricularia gibba were noted along the shallow emergent reeds in 2014, but it has not been seen since. In 2022, diverse turf communities were recorded widely in the upper littoral zone, including *Glossostigma elatinoides*, *Lilaeopsis novae-zelandiae*, *Myriophyllum propinquum*. During the 2026 survey remnants of these turf beds were seen, however they appear to be suppressed by the encroachment of emergent reeds and fluctuating water level. No LakeSPI was generated in 2024 due to cyanobacterial blooms preventing diver entry. This reinforces that episodic bloom risk is a key threat even when long-term macrophyte condition remains strong.

The historic LakeSPI scores show consistently excellent status with indices in the high 80s to low-mid 90s (Figure 1). Native condition has remained high and invasive impacts were minor in 2011 – 2014 and zero in 2004, 2017, and 2026. The 2026 LakeSPI score of 91.43% indicates that Lake Waiporohita currently functions as a near-reference, invasive-free macrophyte system.

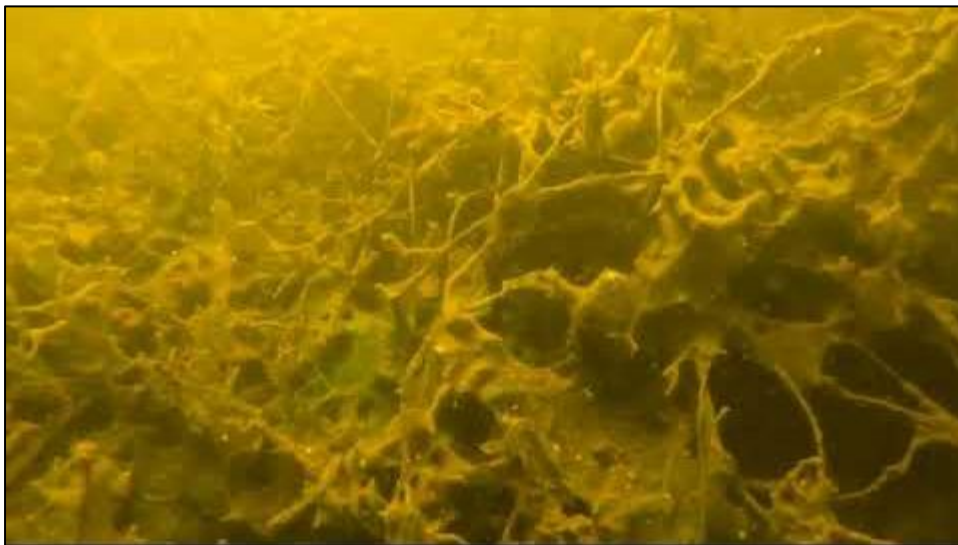


Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
February 2026	Excellent	91.4	80	0
March 2017	Excellent	93.7	85.3	0
May 2014	Excellent	89.7	82.7	4.4
March 2011	Excellent	88	82.7	6.7
Nov 2004	Excellent	92.6	82.7	0

Figure 1: Lake Waiporohita LakeSPI scores as a percentage of the maximum Potential LakeSPI score, Native Condition Index, and Invasive Impact Index.

If current light climate and substrate stability are maintained, Lake Waiporohita is likely to remain in excellent macrophyte condition, with the charophytes and pondweeds continuing to provide substrate stabilisation and maintenance of clear-water conditions. The primary risk is bloom-driven reductions in clarity that could trigger localised vegetation loss and expand bare-substrate zones. Signs of eutrophication and wider algal development was seen along the lower macrophyte extent. Thick benthic algal mats had formed over the charophyte beds and achieved 100% cover across large sections of the vegetated depth profile (Video 3).

While no invasive submerge macrophytes were recorded in 2026, alligator weed and water primrose are present along the lake margin and are forming large beds. The expansion of these beds can displace submerged macrophytes from the upper littoral zone and reduce the overall diversity. Management priorities should focus of containment of emergent invasives and enhancements to water quality through reductions in catchment nutrients and waterfowl biomass.



Video 3: Benthic algal growth smothering charophytes along the lower macrophyte extent.

Wetland birds

The February 2026 survey recorded a grazing waterfowl dominated species assemblage including ~75 black swans (*Cygnus atratus*) and ~100 Canada geese (*Branta canadensis*), with smaller numbers of mallard and mallard-hybrids (*Anas platyrhynchos*), pūkeko (*Porphyrio melanotus*), and welcome swallows (*Hirundo*

neoxena) using the margins. New Zealand dabchick (*Poliocephalus rufopectus*) were present in low numbers, indicating suitable sheltered water and prey availability.

The dominance of large herbivores and the low representation of cryptic wetland specialists is consistent with a small, accessible dune lake with open pasture margins. Previous assessments indicate more intermittent use by mobile species such as paradise shelduck (*Tadorna variegata*), shags (*Phalacrocorax melanoleucos*, *Phalacrocorax varius*, *Phalacrocorax sulcirostris*) and Caspian tern (*Hydroprogne caspia*), reflecting connectivity with nearby coastal habitats and other Karikari dune lakes.

Habitat quality for wetland specialists appears moderate. Emergent wetland vegetation occurs around ~40% of the shoreline but is largely confined to narrow margins with abrupt transitions to pasture, limiting nesting/refuge for more cryptic species. Invasive aquatic and wetland weeds (*Alternanthera philoxeroides* and *Ludwigia* spp.) are an additional pressure that can impact native assemblages. The high swan and goose biomass is ecologically significant because it can elevate nutrient inputs and accelerate eutrophication, increasing the risk of nuisance macrophytes and algal production.

Overall, the lake likely functions as a stepping-stone within the local area but is unlikely to be a major staging site for native species due to limited habitat complexity and the strong influence of grazing waterfowl.

Key management priorities for improving native wetland bird values are wider stock-excluded buffers, invasive aquatic plant control, reducing nutrient inputs, and reducing swan and goose numbers.

Fish & invertebrates

Lake Waiporohita supports a fish assemblage dominated by common bullies (*Gobiomorphus cotidianus*) and shortfin eels (*Anguilla australis*), both of which have been recorded during previous field assessments and again in 2026.

The exotic pest fish *Gambusia affinis* was also present historically and was present in high numbers during the 2026 survey. eDNA collected in 2026 additionally returned a faint signal for longfin eels (*Anguilla dieffenbachii*), an At Risk – Declining species,

although this taxon was not visually confirmed by divers it is possible that they are present. Left-handed snails (*Physella acuta*) were the only commonly observed invertebrate species during the 2026 assessment.

Endangered species

Longfin eels (*Anguilla dieffenbachii*; At Risk – Declining) were detected by eDNA in 2026 at Lake Waiporohita. The lake margins also supported large, localised patches of *Gratiola pedunculata* and (described as a Non-resident Native - Coloniser) along the southern shore (furthest from Inland Road), Lake Waiporohita is a New Zealand stronghold and the location of the species' first national record. Threatened birds recorded during the 2026 survey include New Zealand dabchick (*Poliocephalus rufopectus*; Nationally Increasing), red-billed gull (*Chroicocephalus novaehollandiae scopulinus*; At Risk – Declining), little black shag (*Phalacrocorax sulcirostris*; At Risk – Naturally Uncommon), and royal spoonbill (*Platalea regia*; At Risk – Naturally Uncommon). Protection of shallow littoral habitats and minimisation of shoreline disturbance are likely to be important for sustaining these species.

Lake ecological value

Lake Waiporohita is currently classified as having High ecological value, with an Ecological Value Score of 11/20.

The habitat size is low, reflecting the small lake area (6.4 ha) and shallow maximum depth (3.5 m). Buffering value is moderate with emergent vegetation and local wetland features providing partial littoral protection. Native vegetation cover in the catchment is limited, and the larger western wetland complex is not hydrologically connected to the lake, so buffering of pastoral runoff remains weak at the catchment scale. Connectivity with nearby Karikari wetlands and lakes enhances the value of this lake within the wider landscape so it receives an additional point.

Water quality value remains low due to persistent eutrophic condition, seasonal cyanobacterial blooms and benthic algal development.

Aquatic vegetation diversity and integrity are both high, reflecting the fully native submerged flora, absence of invasive submerged macrophytes, and a 2026 LakeSPI score of 91.43%.

Endangered-species values are low-moderate and no freshwater mussels were recorded in 2026 so the key-species component is not scored.

The overall ecological value remains unchanged since the 2022 assessment. Previous data indicated that the lake was fully vegetated and improving from earlier supertrophic condition, although a dense cyanobacterial bloom prevented direct assessment of submerged ecology in August 2022. In 2026 the lake remains High rather than Outstanding, but this rating is now supported by measured excellent LakeSPI condition despite continued eutrophic pressure and increasing marginal weed invasion.

Threats

Waiporohita is under sustained pressure from nutrient enrichment, invasive weeds and high bird use. Persistent benthic and suspended algal growth indicates ongoing eutrophic conditions, most likely linked to the surrounding agricultural catchment and large population of waterfowls. Large numbers of Canada geese and black swans increase nutrient loading and suppress macrophyte recovery through grazing. The firm sandy bottom and wide pavement unimpeded by reed beds along the southern margin, offers good loafing habitat for waterfowl as evidenced by buildup of effluent on the lake margins. The contribution of waterfowl faeces to freshwater systems remains relatively unstudied (Hahn *et al.* 2008) however Coleman (2008) found that Canada geese produce three times the amount of faecal input as a sheep. Alligator weed is a major threat around the margins and is now advancing into shallow water, where it is likely to displace turf communities and upper littoral vegetation. Easy public access further increases the risk of new pest introductions and spread between sites.

Management recommendations

Management should prioritise reducing external nutrient and sediment inputs through sustained stock exclusion, riparian protection and catchment nutrient management. Containment and ongoing control of alligator weed is needed to stop further spread

within the lake and to other wetlands. The contribution of waterfowl to nutrient loading and grazing pressure should be addressed, particularly if macrophyte recovery is limited. Due to the easy public access, biosecurity measures such as signage and regular surveillance should also be strengthened.