

Lake Kahuparere

12/02/2026

NRC Lake Number: 384



Ecological Condition: High

Submerged Plant Indices	Score	NPS-FM Attribute band
Native Condition Index	52.4%	B
Invasive Impact Index	13.3%	B

Summary

Overall Rank: Lake Kahuparere remains a high-value dune lake, with a strong emergent fringe, western kānuka buffer, native wetland habitat, and predominantly native submerged vegetation. However, it has declined from the 2021 “Outstanding” condition. The main change is a contraction of the submerged macrophyte zone.

Threats: Eutrophication, catchment-derived nutrient and sediment inputs, internal organic loading, and contraction of the native macrophyte zone are the primary threats. Catchment pressure come from pastoral and forestry influences. Waterfowl nutrient inputs may be contributing to ongoing pressure.

Recommendations: Reduce external nutrient and sediment inputs and maintaining existing habitat buffers. Assess the nutrient contribution from waterfowl. Regular monitoring of water quality, monitoring and routine 5-year biodiversity assessments. A formal fish and kākahi survey would also support future management actions.

General description

Lake Kahuparere is a small dune lake situated on the southern tip of the Poutō Peninsula (1703875E, 5974465N) with a surface area of approximately 9.4 ha and a maximum depth of 7.9 m. The lake stratifies seasonally, which may moderate short-term water quality fluctuations but can also promote internal nutrient loading under anoxic conditions in deeper waters.

The lake is situated within a moderately sized catchment of 370.52 ha, resulting in a high catchment-to-lake area ratio. Land cover within the catchment is dominated by exotic vegetation (65.88%), reflecting a mix of pastoral and forestry land uses that exert differing pressures on lake condition. Pastoral land accounts for 21.95% of the catchment and occupies the entire eastern side, where direct hydrological connectivity to the lake increases the likelihood of nutrient, sediment, and faecal contaminant delivery via diffuse runoff during rainfall events.

Forestry is the dominant land use, covering 43.93% of the catchment and extending across much of the western catchment area. Forestry activities influence catchment hydrology and sediment dynamics, particularly during harvesting or earthworks. However, the effects of forestry runoff on lake water quality are partially mitigated by the presence of a substantial native vegetation buffer.

Native vegetation comprises 23.31% of the catchment and occurs as a contiguous mānuka/kānuka block along the western lake margin. This native block forms an effective buffer between the extensive forestry area and the lake, providing important interception of overland flow, stabilisation of soils, and attenuation of sediment and nutrient inputs. In addition to its buffering function, this vegetation contributes to habitat diversity and enhances shoreline stability.

Wetlands make up a small proportion of the catchment (1.28%) and are concentrated along the southern end of the lake. While limited in extent, these wetlands likely provide localised benefits, including sediment trapping, nutrient processing, and support for wetland and aquatic species. Their small size and location below the lake constrains their ability to offset catchment-wide inputs from pastoral and forestry land.

Hydrological inputs to Lake Kahuparere are therefore influenced by a clear east–west land-use gradient, with pastoral runoff pressures from the east and forestry-dominated sub-catchments to the west moderated by native vegetation buffers.

Overall, Lake Kahuparere represents an intermediate condition, where its relatively deep basin and substantial native vegetation buffer provide resilience, but ongoing pressures from pastoral land use and extensive forestry within a high catchment-to-lake ratio maintain a risk of nutrient enrichment and water quality degradation under certain hydrological and management scenarios.

Wetland vegetation

An almost continuous ~15 m wide band of tall emergent vegetation surrounds the lake. *Schoenoplectus tabernaemontani* and *Typha orientalis* are the dominant species with lower covers of *Eleocharis sphacelata*, *Machaerina articulata*, and *Bolboschoenus fluviatilis*. The emergent vegetation extends beyond the wetted edge into open water, forming a floating wetland in places, with rooted emergents occurring to ~0.8 – 1.5 m deep.

A large population of the y At Risk–Naturally Uncommon and regionally Threatened - Regionally Critical fierce lancewood (*Pseudopanax ferox*) is common within the subcanopy and canopy of the remnant kākūka forest on the western side.

The lake supports high wetland structural integrity and high ecological value due to the adjacent remnant kākūka forest that supports regionally critical *Pseudopanax ferox*. No specific invasive wetland plant pressures were noted during the survey.

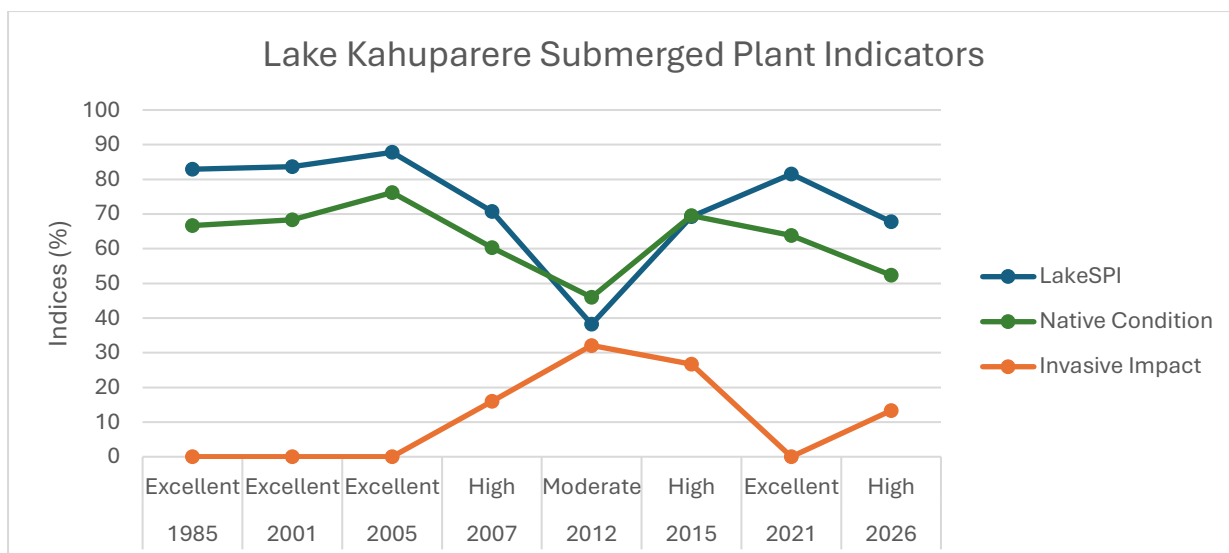
Submerged vegetation

The 2026 survey indicates Lake Kahuparere currently supports predominantly native submerged vegetation, but with a shallower and more spatially constrained macrophyte zone than in earlier high-condition surveys. The macrophyte extent now spans from the edge of emergent reeds (~0.2 – 0.5 m) to a maximum of ~2.0 m, with most of the vegetation concentrated in a ~10 m wide littoral band between ~0.2 – 1.2 m deep. The general vegetation assemblage was characterised by a 25 – 30 cm tall milfoil–pondweed matrix, with *Myriophyllum triphyllum* forming the main canopy (average covers of 26 –

50% and localised covers of 51 – 75%). Potamogeton species (*P. ochreatus*, *P. cheesemanii*) occur frequently and form the lower story below the taller milfoil canopy (1 – 5% average cover with higher density beds of 26 – 50% cover). *Utricularia gibba* was sparse and confined to the shallow margins amongst the emergent reeds (~0.1 – 0.2 m). *Chara australis* formed dense patches (96 – 100% cover, ~25 cm tall) in certain locations rather than the lake-wide meadows which were recorded during previous assessment.

This represents a substantial shift from 2021, when submerged vegetation was charophyte-dominated, with meadows of *Chara australis* and *Chara globularis* extending to ~4.7 m. Native vascular species (*M. triphyllum*, *P. cheesemanii*) were also previously recorded along the deeper contours (~4.3 m). The 2021 condition was assessed as excellent, with a LakeSPI Index of 81.5% and no invasive impact recorded (Figure 1). This reflected a possible recovery and stabilisation following earlier invasive species driven score suppression. In contrast, the 2026 survey shows native vegetation remains dominant, but charophyte meadows have contracted, and the functional bed extent is potentially limited by a reduced photic depth and littoral growing zone.

Historically, Lake Kahuparere scored in the excellent range (82.9 – 87.8) between 1985 – 2005 (Figure 1). A marked decline in condition was recorded in 2007, the lake then rebounded to a high/excellent condition between 2015 - 2021 (LakeSPI score 69.3 & 81.5 respectively) (Figure 1). In 2026 the LakeSPI score dropped to 67.8, which is similar to the condition documented in 2015 (Figure 1). A reduced native condition score (52.38%) and a renewed invasive impact penalty (13.33) was the primary driver of this decline. This indicates that while the lake remains in a generally good ecological state (high condition), the overall condition has deteriorated relative to 2021 and is consistent with the resent state swapping seen since 2005 (Figure 1).



Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
February 2026	High	67.8	52.4	13.3
March 2021	Excellent	81.5	63.8	0
May 2015	High	69.3	69.5	26.7
April 2012	Moderate	38.2	46	32.1
April 2007	High	70.7	60.3	16
March 2005	Excellent	87.8	76.2	0
May 2001	Excellent	83.7	68.3	0
January 1985	Excellent	82.9	66.7	0

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

If existing conditions persist, Lake Kahuparere is likely to remain in the current ecological condition with LakeSPI scores staying in the High range. If the expansion of floating wetlands and encroaching reeds increases the available macrophyte habitat could be reduced, resulting in declining LakeSPI scores. The most likely future macrophyte assemblage, under continued poor water clarity and littoral displacement, is ongoing dominance by the milfoil and pondweed species with patchy charophyte persistence, rather than a re-expansion to lake-wide charophyte meadows. Conversely, improvements in water clarity would increase the probability of charophyte re-expansion and could lead to a shift toward excellent LakeSPI scores.

Wetland birds

Lake Kahuparere supports a diverse assemblage of mainly native waterbirds and wetland specialists. In 2026 dabchick (*Poliocephalus rufopectus*) were the most frequently recorded species, alongside smaller numbers of paradise shelduck (*Tadorna variegata*), grey duck × mallard hybrids (*Anas superciliosa* × *A. platyrhynchos*), pūkeko (*Porphyrio melanotus*), spotless crake (*Zapornia tabuensis tabuensis*), pied shag (*Phalacrocorax varius*), little black shag (*Phalacrocorax sulcirostris*), and red-billed gull (*Chroicocephalus novaehollandiae scopulinus*). A single Caspian tern (*Hydroprogne caspia*) was also recorded.

Threatened and at-risk values are high considering the number of high conservation value species. Previous assessments have also detected Australasian bittern (*Botaurus poiciloptilus*), North Island fernbird (*Poodytes punctatus*) and New Zealand scaup (*Aythya novaeseelandiae*).

The almost continuous ~15 m wide band of tall emergent vegetation surrounding the lake provides high quality habitat for wetland birds. Remnant kānuka scrub on the western margin adds shelter and an intact terrestrial–wetland gradient. The lake provides a stepping-stone environment within the Poutō dune-lake cluster and as an inland roost/foraging option for coastal-linked species (e.g., Caspian tern).

Management actions include maintaining the integrity of the emergent fringe and continuing to protect adjacent kānuka scrub. Additional catchment nutrient management will add ongoing benefits and maintain a steady trophic state.

Fish & invertebrates

Historical records indicate that inanga (*Galaxias maculatus*) have previously occurred in Kahuparere, but the species was not observed by divers in 2026 and was not detected by eDNA. This suggests that they are currently absent or present only at very low abundance.

During the 2026 survey, common bullies (*Gobiomorphus cotidianus*) were observed along the margins of emergent reed beds. Several dead kākahi (*Echyridella menziesii*) were also found below the maximum vegetation depth extent, at approximately 1.7 – 2.0

m. eDNA additionally returned faint signals for *Gambusia affinis* and goldfish (*Carassius auratus*) however, because neither species has previously been recorded from this lake, these detections should be treated cautiously and may reflect sample contamination rather than confirmed occupancy.

Endangered species

Inanga (*Galaxias maculatus*; At Risk – Declining) have been recorded from Lake Kahuparere, and earlier observations have also included nationally critical wetland birds such as grey duck (*Anas superciliosa*) and Australasian bittern (*Botaurus poiciloptilus*), alongside At Risk – Declining fernbird (*Megalurus punctatus*) and other common wetland specialists. During the 2026 survey several threatened birds were recorded including, New Zealand dabchick (*Poliocephalus rufopectus*; Nationally Increasing), spotless crake (*Zapornia tabuensis tabuensis*; At Risk – Declining), red-billed gull (*Chroicocephalus novaehollandiae scopulinus*; At Risk – Declining), Caspian tern (*Hydroprogne caspia*; Nationally Vulnerable), pied shag (*Phalacrocorax varius varius*; At Risk – Recovering), and little black shag (*Phalacrocorax sulcirostris*; At Risk – Naturally Uncommon). On the western lake margin, a large population of fierce lancewood (*Pseudopanax ferox*; At Risk – Naturally Uncommon; Regionally Threatened – Regionally Critical) was common within remnant kānuka forest. Individuals were GPS-mapped, fruiting was frequent, and several large trees were recorded, highlighting the significance of the adjacent forest habitat.

Lake ecological value

Lake Kahuparere is currently classed as a High condition lake, with an Ecological Value Score of 10/20.

The habitat size is considered low because, although the lake reaches 7.9 m depth, its area is only 9.4 ha. The moderate buffering is due to the near-continuous 15 m emergent fringe and the western kānuka buffer, despite only limited wetland extent. Connectivity within the Poutō dune-lake cluster remains an important positive attribute.

Low water quality values are consistent with current eutrophic symptoms. Moderate aquatic vegetation diversity and aquatic vegetation integrity reflects the retention of

predominantly native submerged vegetation but contraction of the charophyte-dominated littoral zone.

No live kākahi were confirmed in 2026, so the key-species component is not currently expressed. Relative to the 2021 assessment, this represents a clear decline in ecological value. The 2021 report described Kahuparere as Outstanding and recorded an ecological value score of 13/20, supported by excellent LakeSPI condition (81.5%), no invasive impact, and charophyte meadows extending to 4.7 m. In 2026, LakeSPI declined to 67.8%, with reduced native condition, renewed invasive impact, shallower vegetation limits and evidence of eutrophication. Accordingly, Kahuparere remains a high-value lake, but no longer supports the Outstanding status assigned in 2021.

Threats

Kahuparere appears to be in a degraded eutrophic state driven by catchment pressure and internal organic loading. High suspended algal biovolume and accumulations of dead algal material on the lakebed indicate chronic nutrient enrichment and repeated bloom collapse. Dense sulphide precipitate throughout the lake further suggests strong decomposition processes and likely oxygen stress in bottom sediments. It is likely that large numbers of waterfowl utilise the lake and contribute to the nutrient loading. The limited macrophyte extent reduces the in-lake nutrient assimilation capacity and overall resilience.

Management recommendations

Management should prioritise reduction of external nutrient and sediment inputs through erosion control, and best practice land management. The role of waterfowl in maintaining nutrient pressure should be considered in restoration planning. Predator control is also advised to support native bird values.

A formal fish survey is recommended to confirm the presence of exotic species (goldfish and Gambusia) and obtain a baseline native species assemblage. A kākahi survey could be added to the fish survey to identify if any live individuals still exist in the lake. Regular monitoring of water quality, algal biomass and sediment condition can inform recovery trajectory and future management actions.