Te Hiku

Lake Pretty (Aupouri), NRC Lake No. 24.

Lake Pretty from the eastern end of the lake showing kānuka dominated marginal scrub and emergent vegetation dominated by kuta (2023, Paul Champion).

Summary	Lake Pretty
Surveyed:	2004, 2015 and 2023
Overall ranking:	**High**: Small relatively shallow (7.2 m) lake with no invasive biota recorded other than *Utricularia gibba*, steep sided except for west end.
Threats:	Low risk of introduction of invasive pests. Risk of nutrient enrichment from pine plantation activities (logging, fertilisers), evidence of impact by wild horses, pigs and possibly cattle.
Management recommendations:	Lake native biodiversity value monitoring every 5 years.

Description

The lake (1584443E 6173185N) is approximately 5.7 ha in area with a maximum recorded depth of 7.2 m. The catchment comprises plantation pine forestry on Holocene sand dune field. There is likely an intermittent flow to the lake from the east, with no discernible outflow. The lake is accessed through well-formed private forestry roads, with easy boat access at end of forest road on north-western side.

Wetland vegetation

Much of the lake margin is steep sided, with margin predominantly of kānuka (*Kunzea linearis*) scrub with rushland at access point. In 2023, emergent vegetation had increased in extent from previous visits (to >50% of lake shore). Dominant species were kuta (*Eleocharis sphacelata*)*, E. acuta, Machaerina articulata* and *Juncus pallidus*.

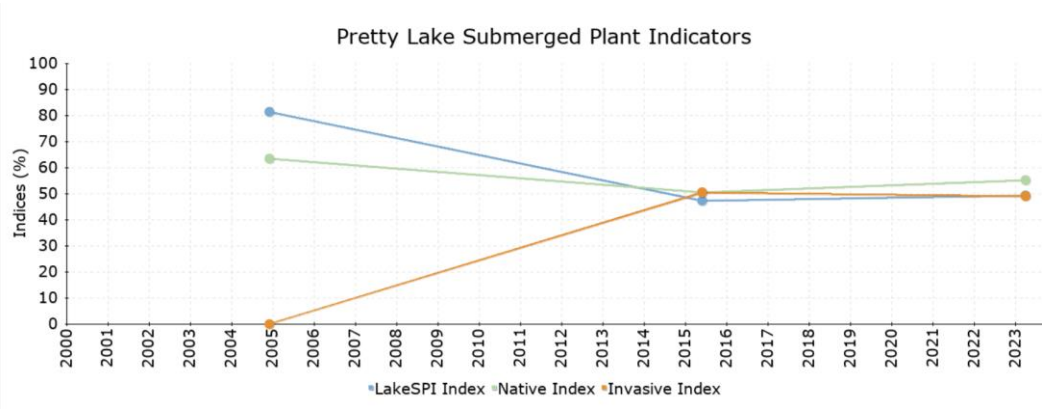
Submerged vegetation

In 2023, no amphibious turf vegetation was observed although *Myriophyllum propinquum* was found in shallow water extending to 2.3 m with average cover exceeding 50% on two transects. The pondweeds *Potamogeton cheesemanii* and *P. ochreatus* grew to maximum depths of 2.1 and 2.4 m respectively, often greater than 1 m tall but usually at low covers (<5%). Four charophytes (in order of abundance) *Chara australis, C. fibrosa, Nitella leonhardii* and *N.* sp. aff. *cristata* formed meadows (>75% cover) at four of the five transects extending to a maximum depth of 3 m, with the deepest recorded plants at 3.1 m. On two transects, decaying charophytes were noted in depths greater than 2.5 m. The invasive weed *Utricularia gibba* was prevalent in four transects, with covers exceeding 50%, extending to 2.1 m. Water clarity was poor, with underwater visibility less than 1 m and humic-staining observed.

On previous surveys (2004 and 2015), open turf vegetation was present dominated by *Glossostigma elatinoides* and *Myriophyllum propinquum* on lake margins to 1.2 m deep, with emergent kuta likely occupying this zone in 2023. Charophyte meadows were dominated by high cover, tall, *Nitella leonhardii* (1.1 m height) and *Chara australis* (0.6 m height). *Chara fibrosa* and *Nitella pseudoflabellata* were also recorded. Charophyte meadows were interspersed with bands of tall (1.7 m) *Potamogeton cheesemanii* to 2 m deep and *Potamogeton ochreatus* (also 1.7 m tall) to 3.9 m deep. No endangered or invasive plant species were found, with the exception of the invasive *Utricularia gibba* growing to 3 m deep in 2015.

Maximum vegetation depth has decreased from 4.4 in 2004 to 3.9 m in 2015 and 3.1 m in 2023.

LakeSPI



Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
March 2023	Moderate	49.3%	55.2%	48.9%
May 2015	Moderate	47.3%	50.5%	50.4%
November 2004	Excellent	81.3%	63.5%	0.0%

Lake Pretty, LakeSPI Index as % of potential score since 2004. Native Condition Index, and Invasive Impact Index (from left to right).

In 2023, a Moderate LakeSPI index of 49% was calculated, close to the 50% threshold for a high condition. This index was marginally higher than that calculated in 2015 (47%). This reflects the diverse native submerged vegetation presence but with a high impact from *U. gibba,* a species not recorded at the lake in 2004, when a provisional Excellent LakeSPI index of 81% was calculated based on three sites.

Water birds

Water bird habitat had likely improved with increasing emergent vegetation. One Australasian little grebe (*Tachybaptus novaehollandiae*) and a kingfisher (*Todiramphus sanctus vagans*) were noted on the 2015 survey, with several kingfishers noted in 2023.

Fish

Common bullies (*Gobiomorphus cotidianus*) frequently observed.

Aquatic invertebrates

The indigenous leech *Richardsonianus mauiensis* was observed in 2023.

Endangered species

The Colonising species Australasian little grebe was noted on the 2015 survey. No other threatened species were recorded.

Lake Ecological Value

A Lake Ecological Value of 10 (High) was calculated for Lake Pretty in 2023. This compared with scores of 7 (Moderate) in 2004 and 9 (High to Moderate) in 2015. The invasion of *U. gibba* between 2005 and 2015, had led to a decline in Native Condition Index from 63 to 50%, with an increase to 55% in 2023. Water quality data from 2004 (after the first visit) reported this lake as mesotrophic, led to an increased score in subsequent calculations. Increase in emergent vegetation cover since 2015 has led to the present High rating.

Threats

There are currently no pest plants (with the exception of *Utricularia gibba*) or fish reported from this lake. The access through private forestry roads (6 km off access road) means the likelihood of introduction of further alien species is low, but if introduced, these could have major deleterious impacts on the lake.

Wild horse impacts included pugged lake margins and absence of emergent vegetation in some shallow water areas. Feral pigs were also noted in the surrounding forest which may affect nutrient run-off from the catchment due to soil disturbance. This would exacerbate impacts from forestry management including harvesting and fertiliser application.

A drop in water level by approximately 3 metres since pines were planted in the catchment was noted in 2004. Water levels appeared to have increased since that time, with dead scrub evident along much of the lake margin in 2015 and also in 2023; presumably resulting from prolonged waterlogging.

Management recommendations

Lake native biodiversity value monitoring every 5 years.