

Te Hiku

Lake Austria (Aupouri), NRC Lake No. 22



Lake Austria from the southwestern margin showing open shoreline with sparse emergent vegetation, with well-developed emergent beds of kuta away from the shore and the scrub covered eastern margin (2023, Paul Champion).

Summary	Lake Austria
Surveyed:	2004, 2015 and 2023
Overall ranking:	High to Moderate: This humic-stained lake supported a diverse submerged vegetation in shallow water with a restricted depth range (1.2 m maximum depth for the 3 m deep lake), but it provides valuable habitat for endangered water birds.
Threats:	Low risk of introduction of further invasive pests. Likely disturbance of the catchment and marginal emergent vegetation by wild horses and pigs. Moderate-low risk of nutrient enrichment from pine plantation activities (logging, fertilisers). Continued decline in water level may further deteriorate lake values.
Management recommendations:	No further monitoring.

Description

This dune lake (1584726.7E, 6174708.5N) is 18 ha in area, with a maximum recorded depth of 3 m. It is situated on a ponded area between Holocene and Pleistocene sand dunes. The catchment is vegetated by pine plantation forestry (50% of margin) and kānuka scrub (50%). The lake has no inflows or outflows. Access is through well-formed private forestry roads but boat access would require a 4WD.

Wetland vegetation

There is a sparse fringe of emergent vegetation in the vicinity of the access point, but extensive beds (>50% lake area) dominated by *Eleocharis sphacelata* with lesser amounts of *Machaerina articulata* grew at the western half of the lake to depths of 2 m. In 2023, water levels were high and amphibious turfs (recorded as emergent in previous visits) were noted in the submerged vegetation.

Submerged vegetation

In 2023, a diverse submerged vegetation was noted extending to 1.2 m depth. Water was clear but heavily tannin stained, reducing available habitat for submerged plants due to limited light penetration. Turfs of *Glossostigma elatinoides*, *Myriophyllum propinquum* and the introduced emergent plant *Ludwigia palustris* growing as a low turf were common in open shallow (to 0.5 m) water areas. Clumps of *Myriophyllum propinquum* also extended into deeper water, with scattered *Potamogeton cheesemanii*. The dominant species were charophytes, with *Nitella leonhardii* most prevalent with average cover of 40%, with lesser amounts of *Nitella* sp. aff. *cristata*, *N. pseudoflabellata* and *Chara australis*. The invasive *Utricularia gibba* was common amongst emergent sedges and rushes but a minor component of the submerged vegetation.

In 2015, *Utricularia gibba* dominated the submerged vegetation forming dense mats smothering charophyte dominated vegetation (predominantly *Chara australis* with some *Nitella leonhardii*), which grew to a maximum depth of 2.5 m. No turf communities were present as a submerged community.

In 2004, turf communities were prevalent to a depth of 1 m, occurring where dense beds of emergent sedges were absent. Dominant species included *Glossostigma elatinoides* and *Lilaeopsis novae-zelandiae*. A range of charophytes were also present in this shallow water zone, with *Chara australis* locally abundant and the milfoil *Myriophyllum propinquum* growing to the maximum vegetation depth recorded in the lake (2.5 m). The nationally endangered *Utricularia australis* was found at low covers throughout the submerged vegetation. The invasive *U. gibba* formed dense surface-reaching mats and extended over much of the submerged vegetation with average covers exceeding 50%.

LakeSPI

No LakeSPI score has been generated for Lake Austria.

Water birds

The isolated nature of the lake and large areas of emergent and wetland vegetation provide good habitat for many aquatic birds. Dabchick (*Poliocephalus rufopectus*) were observed during the 2015 and 2023 visits. The following rare species are also reported: fernbird (*Bowdleria punctata vealeae*), spotless crake (*Porzana tabuensis plumbea*), Australasian little grebe (*Tachybaptus novaehollandiae*) and scaup (*Aythya novaezeelandiae*).

Fish

Īnanga (*Galaxias maculatus*) were observed in Lake Austria during the 2015 visit.

Aquatic invertebrates

No aquatic invertebrates were observed.

Endangered species

The Nationally Critical *Utricularia australis* appears to be extinct in this lake, despite apparently suitable habitat being observed in 2023. At Risk – Declining ĩnanga were seen in Lake Austria in 2015. Nationally Threatened – Increasing dabchick (*Poliocephalus rufopectus*) were also seen in 2015 and 2023.

Lake Ecological Value

Lake Ecological Value of 9 (High to Moderate) was calculated for Lake Austria in 2023. This compared with scores of 8 (High to Moderate) in 2004 and 7 (Moderate) in 2015. The endangered species score has dropped in 2015 and 2023 due to the loss of *Utricularia australis*. Increase in emergent vegetation cover and integrity of the submerged vegetation since 2015 has led to the present High to Moderate rating.

Threats

In 2023, the alien bladderwort (*U. gibba*) was having a minor impact on submerged vegetation compared to previous (2004 and 2015) surveys. The access through private forestry roads (3 km off access road) means the likelihood of introduction of other alien species is low, but if introduced, these would have major deleterious impacts on the lake values.

There was evidence of wild horse impacts on the shallow margins of this lake based on 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.

The water level appeared to have dropped about 1 m since pines were planted in the catchment, and future decreases could occur. However, water levels were high in 2023 reflecting the very wet summer previous to the visit.

Management recommendations

No regular monitoring is recommended.