Te Hiku

Lake Austria (Aupouri), NRC Lake No. 22

Lake Austria margin showing exposed turf communities and *Apodasmia similis* tussocks. Note humic stained water and floating mats of *Utricularia gibba* (centre right).

Summary	Lake Austria
Surveyed:	2004 and 2015
Overall ranking:	**Moderate**: This humic-stained lake was severely impacted by the pest plant *Utricularia gibba* and water level is decreasing, but it provides valuable habitat for endangered water birds.
Threats:	Low risk of introduction of further invasive pests. 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 kanuka scrub (50%). The lake has no inflows or outflows. Access is through well-formed private forestry roads but boat access would require a 4-WD.

Wetland vegetation

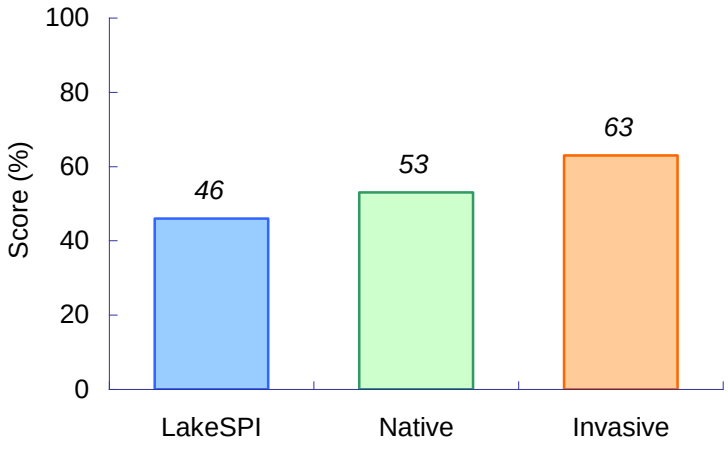
There is a sparse fringe of emergent vegetation in the vicinity of the access point, but extensive beds (30% lake area) dominated by *Eleocharis sphacelata* with lesser amounts of *Machaerina articulata* grew at the western end of the lake to depths of 2 m. Exposed turfs with a mosaic of amphibious and annual herbs was common at the access point and bordering pine forestry, interspersed with tussocks of oioi (*Apodasmia similis*).

Submerged vegetation

No turf communities were submerged in 2015. The invasive *Utricularia gibba* dominated the submerged vegetation forming dense mats smothering charophyte dominated vegetation (predominantly *Chara australis* with some *Nitella leonhardii*). No *U. australis* was found despite extensive searching in 2015.

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%. Density of *U. gibba* had increased in 2015, with limited covers of charophytes and no *U. australis* seen.

LakeSPI



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

The low LakeSPI score of 46% reflects the smothering impact of the invasive *U. gibba* on the submerged vegetation. Profiles were limited so this LakeSPI assessment should be considered provisional. No LakeSPI assessment was made in 2015.

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 visit. 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

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

Aquatic invertebrates

No aquatic invertebrates were noted.

Endangered species

The Nationally Critical *Utricularia australis* appears to be extinct in this lake. At Risk – Declining inanga were seen in Lake Austria in 2015. At Risk Recovering dabchick (*Poliocephalus rufopectus*) were also seen in 2015.

Lake Ecological Value

Based on the 2004 survey, a Lake Ecological Value score of 8 (rated High to Moderate) was calculated. The endangered species score has dropped due to the loss of *Utricularia australis* now having a Lake Ecological Value score of 7, now rated a Moderate water body.

Threats

The alien bladderwort (*U. gibba*) is having a major impact, forming a sprawling mat that extends over other submerged vegetation. The access through private forestry roads (3 km off access road) mean the likelihood of introduction of other alien species is low, but if introduced, these would have major deleterious impacts on the lake values.

There is apparently some livestock access (probably horses?) based on pugged lake margins and absence of emergent vegetation in shallow water areas (see plate).

The water level appeared to have dropped about 1 m since pines were planted in the catchment, and future decreases could occur.

Management recommendations

The lake is highly impacted by *U. gibba*, and the likelihood of introduction of other alien species is low. No monitoring is recommended.