Te Hiku

Lake Te Arai 3 (Aupouri), NRC Lake No. 47.

Lake Te Arai 3. A dune lake with scrub and forestry margins and mobile sand dunes to the north- west.

Summary	Lake Te Arai 3
Surveyed:	2004, 2006 and 2017.
Overall ranking:	**Moderate**: remote shallow, dune lake, native species with *U. gibba,* charophyte meadows, high wildfowl values.
Threats:	Further decrease in water table would reduce the habitat value. Invasive species introductions are unlikely.
Management recommendations:	No monitoring.

Description

This dune lake (N1597392E 6159720N) is recorded as a 12.9 ha area in the NRC database, but the lake occupies c. 8.2 ha, with an ephemeral wetland to the east of the lake formerly contiguous with this. The lake had a maximum depth of 2.2 m. The catchment is mostly scrub, with pine forest to the south and mobile dunes to the north-west. There are no inlets or outlets. Access was gained through 3 km of forestry roads and scrub covered tracks.

Wetland vegetation

The eastern half of the lake was predominately vegetated with emergent raupo (*Typha orientalis*) and *Machaerina arthrophylla* (0 to 0.5 m deep) with kuta (*Eleocharis sphacelata*) growing in deeper water (to 1 m) on about 25% of the lake margin. Additional tall emergent species included *E. acuta,*
M. juncea, M. rubiginosa, M. articulata and *Schoenoplectus tabernaemontani* and the sprawling swamp millet (*Isachne globosa*). Other parts of the lake were fringed with a narrow (<5 m) emergent margin of the same species but with significant sections without emergent vegetation, with turf vegetation dominated by *Glossostigma elatinoides.*

Submerged vegetation

The lake was 90% vegetated with characean meadows of *Chara australis*, and some tall-growing *Potamogeton cheesemanii* and *Myriophyllum propinquum*. The invasive *Utricularia gibba* was abundant. When visited in 2004, only the east end of the lake was accessed and shallow areas of the lake (up to 0.5 m). Amongst emergent vegetation was a dense bed of *Chara australis* dominant in the shallows with small amounts of the exotic *Utricularia gibba,* and *Potamogeton cheesemanii* dominating the vegetation from 0.5 m to a maximum of 1.5 m deep. In 2006, only the west end of the lake was accessed. The same species were recorded but cover was very sparse with just the odd plant present due to heavily stained water with only 0.2 m underwater visibility.

In 2017, the water was much clearer with 1.7 m underwater visibility. The same species were recorded and they covered the lake bottom.

LakeSPI

Lake Te Arai (3) Submerged Plant Indicators

Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
March 2017	High	59%	71%	48%

The high LakeSPI score reflects the dense *Chara australis* dominated submerged vegetation, with *Utricularia gibba* the only invasive species present.

Water birds

Dabchick (*Poliocephalus rufopectus*), black swan (*Cygnus atratus*) and mallard (*Anas platyrhynchos*) were seen. DOC SSBI records from 1991 reported regionally rare fernbird (*Bowdleria punctata vealeae*) and nationally critical bittern (*Botaurus poiciloptilus*).

Fish

No fish were seen.

Aquatic invertebrates

Backswimmers (*Sigara arguta*) and the introduced snail *Physella acuta* were noted. No mussels or koura were seen.

Endangered species

Two At-Risk Recovering dabchick (*Poliocephalus rufopectus*) were seen.

Lake Ecological Value

The condition of Te Arai Lake 3 had increased from moderate-low to moderate in 2017, resulting from the improved native condition index due to well-developed characean meadows.

Threats

Few invasive threats were noted due to difficult lake access, but water levels have receded historically, and forestry management threatens water quality.

Management recommendations

No monitoring recommended.