Poutō Peninsula

Karaka (Poutō), NRC Lake No. 347.

Karaka. Photo taken from the tall pasture covered dunes to the east of the lake. (Photo: Tracey Burton 20 September 2018).

Summary	Lake Karaka
Surveyed:	2005, 2007, 2012, 2015 and 2018.
Overall ranking:	**Outstanding**: A lake with an indigenous vegetation (no *U. gibba*) and fauna, much of the margin surrounded by wetland with nationally endangered plants, fish and birds present.
Threats:	Isolation and difficulty of access through private farmland make likelihood of pest introduction low, but a major impact could result should introduction occur. Water quality is currently poor with submerged vegetation collapse occurring in May 2015. Water quality is likely to be impacted by cattle access, farming intensification and forest harvesting within the catchment.
Management recommendations:	Infrequent pest plant surveillance and lake ecological assessment (5 years). Recommend fencing of the eastern margin to exclude cattle. A consideration of nutrient sources might reveal why this lake is so enriched and inform possible mitigation measures.

Description

This dune lake (1693415E, 5980559N) is 11.1 ha in size and 5.4 m deep with an undulating bottom. It is one of the lakes situated on the south-western Poutō Peninsula between consolidated dunes to the east and mobile dunes to the west. The immediate catchment is pastoral (25%), and flax/sedge/raupō wetlands (75%) extend to the north and south of the lake, linking it with other water bodies with mobile sand dunes at the western end. There are no inflow or outflow streams. Access is difficult through forestry roads and rough pasture over consolidated dunes. The lake has 4-WD access only, with difficult boat access.

Wetland vegetation

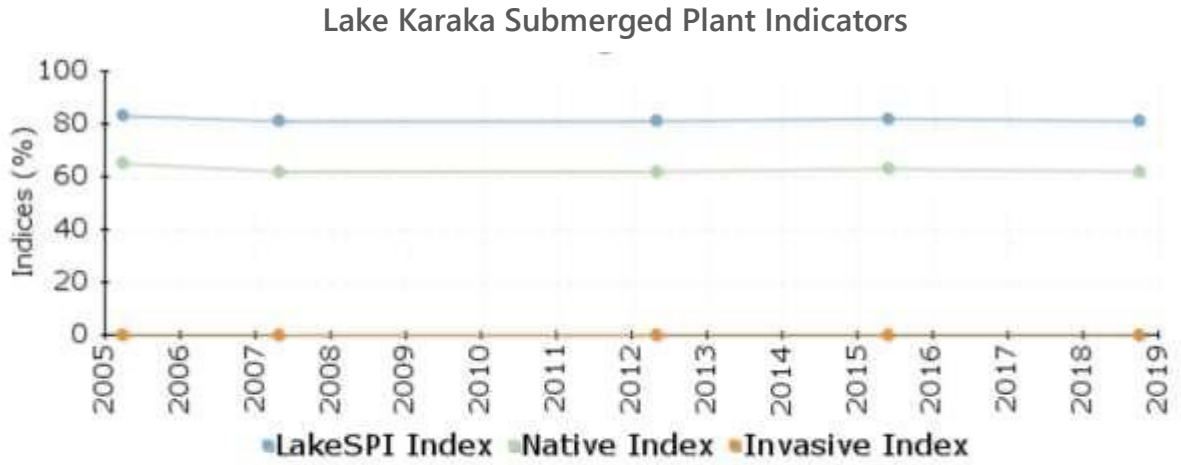
Emergent species encircle most of the lake, except the margin bordered by pasture and open to cattle grazing. *Typha orientalis* and *Machaerina articulata* dominated. These extended over a 20 m wide band in most areas growing to depths of 1.5 m. Other emergent species seen included *Apodasmia similis, Carex maorica, Carex secta, Cyperus ustulatus, Eleocharis acuta, Isachne globosa, Isolepis prolifera, Juncus pallidus, Machaerina arthrophylla, M. juncea, Schoenoplectus tabernaemontani,* flax and cabbage trees. The fern *Thelypteris confluens* was common amongst the *M. juncea* emergent vegetation.

Submerged vegetation

Only native vegetation was recorded in this lake. In 2018, the dominant species was *Chara australis,* which grew to a maximum depth of 2.4 m, in meadows up to 1.5 m tall. Another charophyte, *C. globularis* was recorded in the lake for the first time. The vascular species *Myriophyllum triphyllum* and *Potamogeton cheesemanii* were locally abundant, with lesser amounts of *P. ochreatus*.

The submerged vegetation had recovered from a partial vegetation collapse in 2015, most likely resulting from shading by dense algal blooms.

LakeSPI



Survey Date	Status	LakeSPI %	Native Condition %	Invasive Impact %
September 2018	Excellent	81%	62%	0%
May 2015	Excellent	82%	63%	0%
April 2012	Excellent	81%	62%	0%
April 2007	Excellent	81%	62%	0%
March 2005	Excellent	83%	65%	0%

LakeSPI results for Karaka. LakeSPI Indices expressed as a percentage of lake maximum potential.

Karaka is categorised as being in excellent ecological condition with a LakeSPI Index of 81%.

Water birds

The extensive wetland areas provide outstanding habitat for water birds. Dabchick (*Poliocephalus rufopectus*), little black shag (*Phalacrocorax sulcirostris*), scaup (*Aythya novaeseelandiae*), paradise shelduck (*Tadorna variegata*), pukeko (*Porphyrio melanotus*) and black swan (*Cygnus atratus*) were seen in 2018. Other threatened species previously reported included bittern (*Botaurus poiciloptilus*), banded rail (*Rallus philippensis assimilis*) and spotless crake (*Porzana tabuensis plumbea*).

Fish

Common bully (*Gobiomorphus cotidianus*) were very common, with most specimens having swollen abdomens indicative of an infestation of endoparasitic cestode or trematode species. Both longfin and shortfin eels (*Anguilla dieffenbachii* and *A. australis*) and īnanga (*Galaxias maculatus*) are reported from this lake and several eels were seen during most surveys, including 2018. Giant kōkopu (*Galaxias argenteus*) have been collected from Karaka (T. Birch, DOC pers. comm.).

Aquatic invertebrates

Snail feeding native leeches were noted in 2018. The native snail *Potamopyrgus antipodarum* was recorded from one profile in 2015.

Endangered species

The At Risk – Declining longfin eel (*Anguilla dieffenbachii*), īnanga (*Galaxias maculatus*) and giant kōkopu (*Galaxias argenteus*) have all been recorded from Karaka. The At Risk Naturally Uncommon *Theypteris confluens* was common, growing amongst emergent *Machaerina juncea* at the water's edge. Threatened birds seen in 2018 included At Risk Recovering dabchick and At Risk Naturally Uncommon little black shag.

Lake Ecological Value

An ecological value rating of 13 "Outstanding" was assigned to Karaka with an increase in aquatic vegetation diversity score. However, it appears the lake water quality is declining and trending towards supertrophic (as occurred in 2018), and although submerged vegetation has re-established since 2015, further collapses may occur in the future.

Threats

Relative isolation and difficulty of access makes risk of introduction of pest species low. However, should these be introduced they would displace or significantly impact indigenous biota. Nutrient enrichment from land management in the catchment (or of the aquifer) may be the cause of algal blooms and poor water clarity. Decline of charophytes in 2015 is indicative of the lake being close to flipping from a clear water macrophyte dominated state to a turbid planktonic algal dominated state.

Management recommendations

Lake native biodiversity value monitoring and pest plant surveillance are recommended every 5 years. Consideration of nutrient sources might reveal why this lake is so eutrophic and mitigations measures might be self-evident. Advocate fencing off the eastern shoreline to prevent cattle access to the lake. Information on seasonality of plant condition and water clarity would inform potential management actions.