# Trip report: Three Awhitu Dune Lakes: Puketi, Rotoiti, and Unnamed , 19 March 2011

**Tricia (P.) A. Aspin**

**Attendance (20):** Tricia Aspin (leader), Ezra Barwell, Jan Butcher, Ewen Cameron, Paul Cashmore, Leslie Haines, Marcel Horvath, Peter Hutton, Mei Nee Lee, James Luty, Helen Lyons, Juliet Richmond, John Rowe, Stella Rowe, Jennifer Shanks, Cheryl Taylor, Val Tomlinson, Mike Wilcox, Dave Wilson, Maureen Young.

Lake Puketi, Lake Rotoiti and a nearby smaller unnamed lake lie within Geoff Muir's property in the southern part of the Awhitu Ecological District. These bodies of water have been hemmed in by ancient drifting sand dunes and although the three are in close proximity each is distinct not only in appearance but also in diversity of plant species. All are open to rotational grazing by cattle and it was demonstrated that this can be beneficial to our smaller species in the presence of vigorous exotics such as Mercer grass (*Paspalum distichum*). The summer had been unusually wet and water levels were higher than usual for this time of year. However, we were still able to observe lakeside turf species even though it meant getting our feet wet.

An easy walk through grazed farmland brought us to Lake Puketi (Fig. 1), the largest of the three. This lake is fringed by a ring of wetland species ranging from the smaller herbaceous plants to standing reed beds including raupo (*Typha orientalis*), tall spike sedge (*Eleocharis sphacelata*) and *Baumea articulata*. Several thickets of grey willow (*Salix cinerea*) intermingled with flax (*Phormium tenax*) are also present. We noted a small cabbage tree (*Cordyline australis*) under the willow also. Several small "beaches" have small areas of lakeside turf.

**Fig. 1. Overlooking Lake Puketi. Photo: Mike Wilcox, all photos 19 Mar 2011.**

As soon as we reached the waterside botanising began in earnest. Sparse *Gratiola sexdentata* listed as Regionally Critical (Stanley et al. 2005) was first noted here three years prior (Aspin 2008) and it was heartening to see how well it is establishing. A small partially submerged log (Fig. 2) hosted a mat of around six different species including the indigenous

**Fig. 2. Botanising a partially submerged log, Lake Puketi. Photo: Mike Wilcox.**

species *Gratiola sexdentata, Glossostigma elatinoides* and *Limosella lineata* in flower (Fig. 3) intermingled with *Lilaeopsis novae-zelandiae.* *Glossostigma*, Regionally Sparse (Stanley et al. 2005) was present in its more open submerged form in water to around 350mm in depth. The charophyte *Chara fibrosa* was here also. Fresh water mussels were in the soft sand. Small fish in schools, some with orange colouring, were observed here and later in Lake Rotoiti as well. We were unable to identify them on the day but suspect that they included the exotic species rudd.

We moved in an anticlockwise direction and soon saw a myriad of small yellow flowers of the exotic bladderwort (*Utricularia gibba*). This was first noted here in December 2009 (voucher: AK 310183) and it is amazing how rapidly it has spread.

Along the northern shores it was time to watch for *Hydrocotyle pterocarpa* and we found a few plants beneath the willows and among the grazed turf. This species is listed as Data Deficient (Stanley et al. 2005). The sandy area by small sandstone boulders was a known site for tiny *Myriophyllum votschii* (AK 294951) but with high water levels we hunted in vain among the plentiful larger *M. propinquum* until Lesley spied two small sprays nestled beside a large cowpat.

**Fig. 3. *Limosella lineata,* Lake Puketi. Photo: Tricia Aspin.**

This "beach" area gives an open view through a break in the reed beds and several waterfowl were observed including black swans with fluffy grey cygnets, numerous paradise ducks and a pair of dabchicks with two young. Pukeko, unusually quiet, were only occasionally noted in the reeds.

Further along near the gap in the ridge it was heartening to find a lot more *M. votschii* on a sandstone boulder (Fig. 4). This species is listed as Regionally Range Restricted (Stanley et al. 2005). Flowering *Bidens frondosa* was present in the reed fringe, and Ewen (long legs are an advantage) volunteered to collect some so Maureen could observe the achenes. Near the gap in the ridge a single Bathurst bur (*Xanthium spinosum*) sub-shrub was the subject of interest. Locals report that it is not common but does occur occasionally in the sandhill areas of the district.

We went through the gap and lunched overlooking Lake Rotoiti. This lake is completely fringed by reed

**Fig. 4. *Myriophyllum votschii,* Lake Puketi. Photo: Tricia Aspin.**

beds and we stayed on the southern side. Here we observed the foliage of the Regionally Critical *Ranunculus macropus* (Stanley et al. 2005), similar to *R. amphitrichus* but more robust. Wooden railings provided dry access to a floating platform between belts of reeds (Fig. 5). Swamp millet (*Isachne globosa*) was dominant with much *Hydrocotyle pterocarpa,* several stands of seeding *Epilobium pallidiflorum, Carex virgata* and some localised ferns *Blechnum novae-zelandiae, Dicksonia squarrosa, Histiopteris incisa* and *Hypolepis ambigua*. We had hoped to find burr-reed (*Sparganium subglobosum*) here but it was not to be. Further along the southern shore we saw more gratiola. The western arm of Rotoiti carries swathes of *Lachnagrostis filiformis* in spring but only a couple of mature seedheads were seen today. *Persicaria decipiens* was in full flower bathing the sometimes dry western extremity in a sea of pink.

We continued over a small rise to overlook the small unnamed lake. The eastern end has very tall stands of raupo and several large old crowns of *Carex secta* while the western shores have open water. Again we stayed on the southern side. Nearing the open water we found the floating liverwort *Ricciocarpos natans* intermingling with watermeal (*Wolffia australiana*) and the exotic purple duckweed (*Landoltia punctata*). Neither the liverwort nor watermeal had been noted here before (for a complete vascular species list for all three lakes, see Cameron & Aspin 2011). The jewel in this lake is the abundance of *Potamogeton ochreatus* another species regionally at risk (Stanley et al. 2005). It differs from the more common *P. cheesemanii* in that all leaves are submersed. The bottom of this lake drops down steeply from the shore and we were able to observe the thick underwater band of potomageton with occasional seed heads showing from around knee depth.

**Fig. 5. A handy walkway to a floating plant platform, Lake Rotoiti. Photo: Mike Wilcox.**

We returned over a rise to the western end of Lake Puketi and completed the circuit along the southern side through a herd of dry dairy cows. Another small patch of gratiola with fully opened flowers was noted in the damp margins. On climbing back up from the lake we noted a patch of thorn apple (*Datura*

*stramonium* var. *tatula)* with distinct purple stems. We returned to the cars around 3pm after a very pleasant day and well satisfied with the fact that we had observed six species on the Auckland Regional Threatened & Uncommon Vascular Plants List (Stanley et al. 2005).

**Acknowledgments**
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**References**

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# Flora of eight southern Awhitu dune lakes, southwest Auckland

**Ewen K. Cameron & Tricia (P.) A. Aspin**

## Introduction

All the high coastal land of the Awhitu Peninsula down to the Waikato River mouth was formed by the gradual build up of a series of coastal sand dunes – each set of dunes, stabilised by forest, was subsequently buried by later dune advance and so the process continued over the last 2 million years or so (Hayward 2008). Most of the forest is long gone as shown by the Waipipi Block Survey map (Smith 1864), and the Whiriwhiri and Maioro Survey map (Reay & Clayton 1864) which show only rough open fern, scrubland-flax (*Phormium tenax*), toetoe (*Cortaderia splendens*), and coastal shrubs on the unconsolidated sand dunes. This dune land at southern Awhitu is now mainly farmed with exotic forestry at the southern tip. However, a number of small lakes and wetlands still exist filling the hollows of the old sand dunes.

The first published botanical account of this general southern Awhitu area was by Carse (1901), followed over a century later by Aspin (2008). Five southern Awhitu lakes (Otamatearoa, Kokahuake, Puketi, Rotoiti and Whatihua) were included as part of a wider lake health survey by NIWA of the Waikato and Auckland Regions during 2004-09 (Edwards et al. 2005, de Winton & Edwards 2009).

From 2006 to March 2011 we surveyed the best eight dune lakes in the southern Awhitu area: Whatihua, Puketi, Rotoiti, unnamed, Otamatearoa, Kokahuake (Parkinsons), Rotopopo, and Pongahurahura Lakes. They are spread over 6 km on old sand dunes, 1-2 km in from the coast, at 70-110 m asl (Fig. 1). Most lakes were visited at least twice (see Appendix 1) and our most recent visit to Lakes Puketi, Rotoiti and unnamed was with the Auckland Bot Soc (see Aspin 2011). Our survey was carried out by walking around the lake margins recording the flora, wading out in places but no underwater survey was carried out by us. However, washed up material was included and charophyte presence/cover was estimated by wading out from the margins. Although the emphasis of our survey was on the vascular flora, where observed,

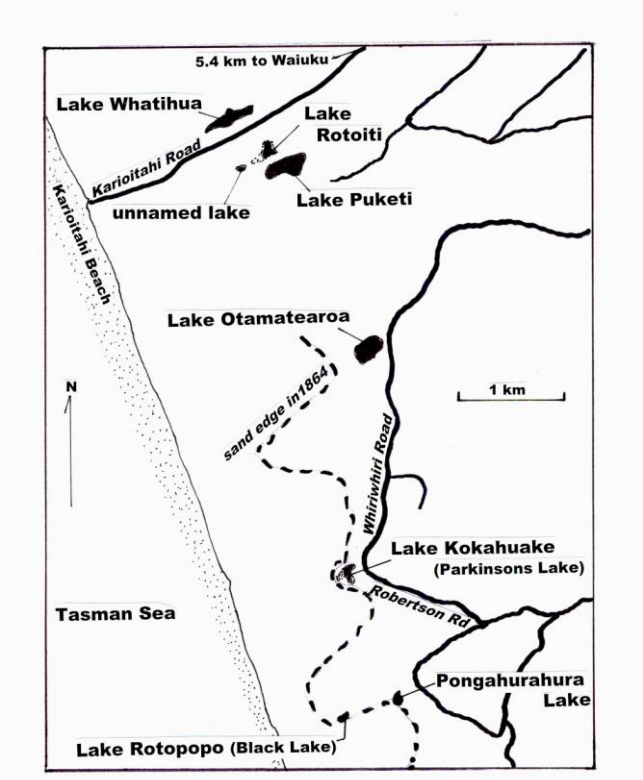


**Fig. 1. Location of eight dune lakes surveyed in the southern Awhitu Ecological District (drawn by EKC).**

algae (charophytes) and bryophytes were collected, later identified and were included in Appendix 1. Most of the lakes contained a large area of open water fringed by a usually narrow margin of emergent vegetation. The smaller lakes of this area not included in the survey are much more highly modified (PAA pers. ob.).

Apart from the Crown-owned Lake Kokahuake, all the lakes surveyed are on private land; Lakes Puketi and Rotoiti are both covenanted to DoC (Department of Conservation). Except for parts of Lakes Kokahuake and Whatihua all lakes are unfenced from stock (Fig. 2). The degree of grazing varies on stocking densities and cattle rotation. Except for one, none of the lakes have a natural outflow and therefore the levels