

FLORA AND VEGETATION OF KAWEKA LAKES
KAWEKA STATE FOREST PARK

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Following a request by Conservator of Forests, Palmerston North, seeking advice on zoning the Kaweka Lakes as an Ecological Area, a party of three (Mr A.P. Druce, retired, ex Botany Division, DSIR, Taita; Mrs B.R. Clarkson, Botany Division, DSIR, Rotorua; Ms C.E. Regnier, SES, Department of Lands and Survey, based in Rotorua) carried out a botanical survey of the area from 9-11 April 1984. The survey was concentrated on the lakes and surrounding vegetation, a total area of about 60 ha (Fig. 1).

INTRODUCTION

Kaweka Lakes are two small lakes (areas about 5 ha and 8 ha) at 650 m a.s.l., 5 km north-east of Kuripapango (Napier-Taihape Road) in the southern half of Kaweka State Forest Park. Tertiary sandstones and mudstones have weathered to form flat to rolling topography around the lakes, whereas westwards the terrain rises steeply to a rugged greywacke ridge, the highest peak being Kuripapango at 1250 m a.s.l. Alluvial fans of recent origin have formed where streams drain into the lakes, mainly from the north.

Past fires have reduced much of the vegetation in the survey area to seral manuka shrubland and scrub. The vegetation immediately adjoining the eastern and southern boundaries had been reburnt, to facilitate the establishment of exotic forest, only weeks before the survey was carried out. East of this recent burn, and also extending partway north of the survey area, large tracts of former shrubland and scrub have been cleared and planted in pines.

The twin lakes were formed as a result of the damming of two stream valleys by debris from a massive slip of the greywacke ridge many thousands of years ago (pre Taupo eruption). The northern extent of the debris flow, as evidenced by the limit of the shattered greywacke on 'West Lake' foreshore, is depicted in Fig. 1. In the area of greatest deposition a hummock-and-hollow land surface was formed. Andesitic ash, which had already deeply mantled the whole area, continued to fall and covers the greywacke debris. After the Taupo eruption the hollows received an infilling of pumice. From 'West Lake' an underground stream emerges in a gully on the southern boundary of the debris flow, some 500 m from the outlet. No similar outflow was discovered for 'East Lake'. However, a seepage along the western part of the waist of land between the two lakes suggests that East Lake may periodically overflow into the slightly lower 'West Lake'.

'West Lake' has a fluctuating water level, whereas 'East Lake' is relatively stable, resulting in markedly different shoreline habitats. When the water level is low (as it was at the time of our visit) 'West Lake' has a gravelly and sandy shoreline, sparsely covered with various herbs, grasses, sedges and rushes, or else herbfield mats. In contrast, 'East Lake' is surrounded for the most part by Baumea rubiginosa sedge-land.

Although small, the survey area, with its lakes, seral shrubland and scrub, forest remnants, and pumice-infilled hollows, has a high diversity of vegetation types and a large number of plant species (288 indigenes and 59 adventives recorded; Appendix 1).

VEGETATION TYPES (Fig. 1)

A. 'West Lake'

1. Aquatic plants

Aquatic plants are few and mainly concentrated in the shallow water at the north-eastern end of the lake. The more common species are Myriophyllum propinquum, Potamogeton cheesemanii and the adventives Potamogeton crispus and Ottelia ovalifolia.

2. Shoreline gravelfield and sandfield

The lake shoreline in the southern sector comprises a shattered greywacke gravelfield which changes to a sandfield north of the limit of the greywacke slip debris. The shoreline is sparsely vegetated overall and characterised by scattered individuals of Graphalium involucreatum, G. limosum, Wahlenbergia colensoi, Lachnagrostis filiformis, Rorippa palustris, seedlings of manuka (Leptospermum scoparium), Centipeda sp., Deschampsia caespitosa, Lepidosperma australe and the adventives Cirsium vulgare and Linum catharticum. Turfy patches of Galium sp. (unnamed, aff. G. perpusillum), Lilaeopsis sp. (cf L. novae-zelandiae), Centella uniflora and Dichondra sp. (cf D. brevifolia) are present on the lower shore.

3. Shoreline herbfield

Herbaceous species dominate shoreline seepages and poorly-drained alluvial fans, forming up to 100% cover at the northern end of the lake. In the north-west bay vegetation zonation is particularly well developed. Here, submerged lax mats of Myriophyllum propinquum and Potamogeton cheesemanii give way at the water's edge to dense turfs of Myriophyllum propinquum, Hydrocotyle hydrophila, Hypsela rivalis and Lilaeopsis sp (cf. L. novae-zelandiae). Higher up the shore is a zone of grasses, namely Lachnagrostis striata and L. filiformis, which merges into a band of sedges, e.g. Eleocharis acuta and Carex dipsacea, and ultimately grades into manuka scrub of Type 7.

In the north-east sector where the stream drains into the lake the dominant species are Eleocharis acuta, Gnaphalium spp. and the adventive grass, browntop (Agrostis tenuis). Some patches of raupo (Typha orientalis) also occur here.

4. Alluvial fan herbfield

The alluvial fan associated with the main drainage stream and bounded to the south by vegetation of Type 3, has a thick cover of abundant Juncus gregiflorus, Yorkshire fog (Holcus lanatus) and creeping buttercup (Ranunculus repens), and occasional Carex geminata, C. sinclairii and Potentilla anserinoides. A few scattered manuka shrubs are also present.

B. 'East Lake'

5. Baumea sedgeland

Around the fringes of the lake is a Baumea rubiginosa zone, which varies from about 1 m wide along parts of the southern shore to more than 20 m wide at the northern end, and covers large areas of low-lying ground to the east. In places, scattered manuka up to 1 m high, overtops the B. rubiginosa. On the lake side of the zone, in deeper water, a belt of Eleocharis sphacelata is usually present.

6. Manuka/Baumea-Carex shrub sedgeland

An area of impeded drainage on the alluvial fan at the north end of the lake is dominated by individuals or clumps of manuka scattered over a lower canopy of Baumea rubiginosa, B. tenax and Carex echinata. Patches of flax (Phormium tenax) also occur here. Other common species are four-square sedge (Lepidosperma australe), Schoenus pauciflorus, umbrella fern (Gleichenia dicarpa) and Scirpus fluitans.

C. Other Areas

7. Kanuka/manuka scrub

Second-growth scrub dominated by manuka (Leptospermum scoparium) up to 5 m tall covers most of the land surrounding the lakes. Kanuka (Kunzea ericoides) overtops the manuka in many places, becoming more frequent westwards and finally forming a closed-canopy kanuka forest up to 12 m tall. Seedlings and saplings of Carpodetus serratus and a few of red beech (Nothofagus fusca) were noted in this short forest.

The understorey is relatively sparse with a low (usually less than 1 m) shrub layer of Gaultheria antipoda, prickly mingimingi (Cyathodes juniperina), Olearia furfuracea, bracken (Pteridium esculentum) and Coprosma rhamnoides. Ground cover species include Uncinia uncinata, Blechnum sp. (Lomaria latifolia), Lycopodium volubile and Poa anceps var. anceps, with Clematis forsteri sprawling over both the ground and shrub layers.

The margins of some hollows within this scrub contains stands of monoao (Dracophyllum subulatum) which grade into grassland of Type 10.

8. Monoao-manuka shrubland

North-east of 'East lake' is an extensive area of monoao-manuka shrubland interspersed with large, sparsely vegetated erosion patches where the commoner species are bracken, woolly moss (Racomitrium lanuginosum) and Cassinia vauvilliersii. The presence of numerous dead manuka and occasional kanuka stems, together with the above-mentioned early successional species, indicate a more recent burn than in vegetation of Type 7.

9. Beech forest

Beech forest stands, comprising Nothofagus solandri and N. fusca, are best developed in sheltered valleys running down from Kuripapango Peak; they were not investigated.

10. Grassland

Hollows in the hummock-and-hollow land surface are dominated by adventive grasses such as Chewings Pescue (Festuca rubra), browntop (Agrostis tenuis) and swards of the herb Hieracium pilosella. Monoac shrubs are scattered on the fringes of this type and a few mature cabbage trees grow only in a large hollow south of 'West Lake'.

BOTANICAL SIGNIFICANCE

Kaweka Lakes are of considerable botanical significance for the following reasons:

1. For such a small area there are large numbers of species and vegetation types present.
2. Four species of national significance, due to their very local distribution in New Zealand, grow in the survey area:
 - (a) Amphibromus fluitans - a very rare grass recorded in only a few North Island localities, e.g. L. Wairarapa.
 - (b) Galium sp. (unnamed; aff. G. perpusillum) - a taxonomically undescribed herb. NW Rushine Ra. is the only other NI locality known. Also found in SI locally.
 - (c) Rorippa palustris - a herb which grows on a few lake shores in NZ.
 - (d) Deschampsia caespitosa var. macrantha - a grass found in a few wet places in NZ.
3. Eight species uncommon in New Zealand grow in the survey area:
 - (a) Carex cirrhosa - sedge
 - (b) Gastrodia minor - orchid
 - (c) Pterostylis foliata - orchid
 - (d) P. micromeqa - orchid
 - (e) Lachnagrostis striata - grass
 - (f) Senecio sp. (unnamed; aff. S. glaucophyllus) - herb
 - (g) Hypsela rivalis - herb
 - (h) Ranunculus limosella - herb
4. It would be a useful place to study vegetation succession as the succession pathway is evident, i.e. all seral vegetation (particularly Types 7 & 8) should eventually revert to beech forest.

5. The two different lakes, less than 100 m apart, constitute a very special ecological situation. Contrasting faunal populations probably also occur. Here, again, the area should prove ideal for detailed study.

CONCLUSIONS AND RECOMMENDATIONS

1. The results of this survey show that, by evaluation on botanical grounds alone, the Kaweka Lakes area warrants protection by dedication as an Ecological Area.
2. The boundaries of the proposed Ecological Area should, as far as is still feasible, follow catchment boundaries.

Suggested boundaries are:

north-east to the pine forest margin, east to the margin of the very recently burnt land, south to the 'West Lake' outlet stream, and west and north-west to the crest of the greywacke range encompassing catchments of streams draining into the lakes (Fig. 2). This incorporates an area of about 250 ha which is considered to include the minimum mature vegetation required to provide a seed source enabling vegetation successions to proceed as naturally as possible.

3. The vehicle access road should be closed at points x and y (see Fig. 1), and only a walking track maintained from there on. This will minimise pressure on the surrounding vegetation and prevent boating in the lakes, which leads to the introduction of noxious aquatic weeds.
4. Management to foster the envisaged natural succession from shrubland to forest will require eradication of self-sown pines when they appear.
5. The vegetation condition should be regularly monitored, and introduced animals controlled when necessary, to ensure that the botanical values of the Kaweka Lakes are not compromised.

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