

Mosses of "Battle Hill Bush", Battle Hill Farm Forest Park, Paremata

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Fifteen hectares of bush form part of the Battle Hill Farm Forest Park on the eastern side of the road between Pauatahanui and Paekakariki. Known in the past as the Horokiwi Reserve, this area is familiar to Wellington botanists principally for the region's only colony of waiuatua (*Rhabdothamnus solandri*). Whilst we can confirm that this shrub is still in the reserve the purpose of this note is to record some observations on the mosses. In particular we provide a check list of moss species found on visits made between October 1988 and May 1989. This forms part of a continuing project on the mosses of the Wellington Region started by the authors in 1985.

The area (NZMS 1, N160 48-500 to 48-510) consists of a valley floor and a well-gullied valley side rising from 60 to 150 m asl. In part, the reserve is steep (to 45 degrees). A strip up to 50m wide forms the rim of the valley and includes some permanently moist sites at the head of the otherwise only occasionally wet gullies. There is a moist side valley at the southern end of the reserve. In contrast, an additional one hectare of grassed slope forms a fire break at the northern boundary.

The area has been enclosed for several decades, although the generally open understorey below the forest canopy suggests that stock have entered the reserve in recent times. The area was fully fenced prior to the purchase of the property by the Wellington Regional Council in 1987.

Five major habitat types, based on vegetation, are apparent.

Valley Floor

On the valley floor the dominant species is in places tawa (*Beilschmiedia tawa*) and at others titoki (*Alectryon excelsus*). These form an open treeland with patches of mahoe (*Melicactus ramiflorus*), kawakawa (*Macropiper excelsum*), and *Coprosma rhamnoides*. The habitat is interspersed with rank pasture and introduced weeds such as *Tradescantia fluminensis*. Pasture extends to the stream banks in some places whilst native shrubs provides deep shade in others. In several places, the bank is a vertical rock overhung with vegetation which provide more shady habitats for mosses and liverworts.

Included in this habitat is a side valley at the southern end of the reserve which reaches almost to the eastern rim. The top of this valley has some exotic trees, including holly (*Ilex aquifolium*), whilst at the lower end it is notable for a few native podocarps and a small wet site including patches of surface water.

Waiuatua occurs in this valley and on its lower slopes.

Kohekohe Forest

The well drained valley side supports a mature, in places almost pure, forest of kohekohe (*Dysoxylum spectabile*). Here the understorey consists of sparse mahoe and kawakawa. There are some areas of supplejack (*Ripogonum scandens*) but otherwise the forest is open with occasional *Blechnum filiforme* over litter and broken rock. On the less steep slopes there is a good cover of litter. At the edges some large mahoe, and shrubs such as hangehange

(*Geniostoma rupestre*) and *Coprosma rhamnoides* form a generally open border.

In the kohekohe forest are numerous dead trunks of mamaku (*Cyathea medullaris*) suggesting that in earlier times the canopy was less complete than it now is.

Towards the northern end of the valley there are some areas where kohekohe gives way to a vegetation dominated by mahoe and kawakawa with a similar open floor of broken rock, litter and the maiden hair fern *Adiantum cunninghamii*.

Ridges

The eastern rim of the valley forms the upper boundary of the reserve. Here, and on ridges extending down through the kohekohe forest, the vegetation was once pasture. Some remains. In other places it has been replaced by gorse (*Ulex europaeus*), a climbing rata, *Metrosideros perforata*, and mahoe.

Where the side gullies cut into the eastern rim they are less steep and form small permanently moist areas. This allows ferns such as *Blechnum filiforme*, a few *Blechnum discolor* and plants of *Lastreopsis* species to form a ground cover and supports some liverworts and mosses.

Grassland

Pasture forms a band at the northern end of the reserve. In the valley floor this takes the form of rank grass and exotic herbs. On the slopes, the grass gives way to an almost stable scree with rocky outcrops and occasional shrubs.

Macrocarpa

There are several small stands of macrocarpa (*Cupressus macrocarpa*) on the valley rim and a number standing along the western edge of the reserve, against the road. Their deep shade leaves a minimal understory and ground cover.

These descriptions show that there is a variety of habitats and substrates ranging from shaded stream banks and seepages through shrubland and mature forest to dry rock.

Permanently moist sites are limited to the stream, to the tops of gullies and an occasional boggy area on the valley floor.

The general lack of moist habitats limits the quantity of bryophytes, but the range of habitats allows a large number of species to be represented.

The reserve is also notable for a number of species which are not common in the Wellington area:

Trichostomum brachydontium has not previously been found in the Wellington area. This moss was found on bare soil below macrocarpa. This has been recorded in New Zealand only since 1978, possibly because it looks, in the field, like *Weissia controversa* and needs microscopic examination to distinguish it.

Porotrichum oblongifolium was found in only one place in the reserve, on rock. This has not been noted in the Wellington region since 1950 when it was recorded from Butterfly Creek and earlier in Wilton Bush.

Leptodon smithii is surprisingly common in the reserve. This species is plentiful in the north of the South Island but has seldom been recorded in the Wellington Region.

Thuidium sparsum has only recently been recognised as a species in its own right. While we believe it to be common in the Wellington area, it will require some further field work to establish this.

Echinodium umbrosum is a very small moss that has not often been recorded in the Wellington area. We have recorded it once from Tinakori Hill. The previous record is from Wilton Bush in 1939.

The genus *Fissidens* is well-represented. Among them is an as yet unidentified species with affinities to *F. taylorii* and noted by Dr J. Beever as being close to *F. eiphytus*.

Apart from these notable exceptions the moss flora of the reserve is typical of that in similar habitats in the Wellington region.

A full list of the moss species is provided below. Voucher specimens are held in the National Museum Herbarium (WELT).

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APPENDIX: Mosses of Battle Hill Bush

(Columns refer to major habitat types, the lower case letters show the substrates - see key below)

	Herbarium Register Number (WELT)	V	D	R	M	G
<i>Achrophyllum dentatum</i> (Hook f. & Wils.) Vitt & Crosby	M26132	w	w	•	•	•
<i>Bryum billardierei</i> Schwaegr.	M26133	s	•	•	•	•
<i>Calomnium complanatum</i> (Hook f. & Wils.) Lind.	M26134	l	t	•	•	•
<i>Calyptopogon mnioides</i> (Schwaegr.) Broth.	M26135	t	•	•	•	•
<i>Calyptrochaete brownii</i> (Dix.) Bartlett	M26136	•	sl	l	•	•
<i>Camptochaete angustata</i> (Mitt.) Reichdt.	M26137	t	•	•	•	•
<i>Camptochaete arbuscula</i> (Sm.) Reichdt.	M26138	t	•	•	•	•
<i>Campylopus clavatus</i> (R.Br.) Wils.	M26139	s	s	s	•	•
<i>Campylopus introflexus</i> (Hedw.) Brid.	M26140	l	•	•	•	•
<i>Campylopus pyriformis</i> (Schultz) Brid.	M26141	•	s	•	•	•
<i>Cryphaea tenella</i> Hornsch. ex C. Muell.	M26142	t	•	•	•	•
<i>Cyatophorum bulbosum</i> (Hedw.) C. Muell.	M26143	•	l	•	•	•
<i>Dicranoloma billardierei</i> (Brid. ex anon.) Par.	M26144	•	•	s	•	•
<i>Dürichium difficile</i> (Duby) Fleisch.	M26145	s	•	•	•	•
<i>Echinodium hispidum</i> (Hook f. & Wils.) Reichdt.	M26146	r	s	•	•	•
<i>Echinodium umbrosum</i> (Mitt.) Jaeg.	M26147	•	trs	•	•	•
<i>Eurhynchium muriculatum</i> (Hook f. & Wils.) Jaeg.	M26148	sl	sl	•	•	•

<i>Fissidens aff. taylorii</i>	M26149	w	•	•	•	•
<i>Fissidens anisophyllus</i> Dix.	M26150	sw	s	•	s	•
<i>Fissidens asplenioides</i> Hedw.	M26151	sw	•	•	•	•
<i>Fissidens humilis</i> Dix. & Watts	M26152	s	•	s	•	•
<i>Fissidens leptocladus</i> C. Muell. & Rod.	M26153	w	s	•	s	•
<i>Fissidens pungens</i> C. Muell. & Hampe	M26154	ws	s	•	s	•
<i>Fissidens rigidulus</i> Hook. f. & Wils.	M26155	w	•	•	•	•
<i>Homalia punctata</i> (Hook. f. & Wils.) Wijk & Marg.	M26156	•	lrs	•	•	•
<i>Hymenodon pilifer</i> Hook. f. & Wils.	M26157	t	•	•	•	•
<i>Hypnum cupressiforme</i> Hedw. var <i>cupressiforme</i>	M26158	tl	•	•	•	•
<i>Hypnum cupressiforme v. filiforme</i> Brid.	M26159	t	t	•	•	•
<i>Hypopterygium commutatum</i> C. Muell.	M26160	•	•	w	•	•
<i>Hypopterygium filiculaeforme</i> (Hedw.) Brid.	M26161	•	w	•	•	•
<i>Hypopterygium rotulatum</i> (Hedw.) Brid.	M26162	w	•	•	•	•
<i>Leptodon smithii</i> (Hedw.) Web. & Mohr.	M26163	t	s	•	•	•
<i>Leptodontium interruptum</i> (Mitt.) Broth.	M26164	•	•	s	•	r
<i>Leptostomum inclinans</i> R. Br.	M26165	t	t	t	•	•
<i>Leucobryum candidum</i> (P. Beauv.) Wils.	M26166	t	s	•	•	•
<i>Lopidium concinnum</i> (Hook.) Wils. in Hook.f.	M26167	t	t	•	•	•
<i>Macrocoma tenue</i> (Hook. & Grev.) Vitt	M26168	lt	•	•	•	•
<i>Macromitrium gracile</i> (Hook.) Schweagr.	M26169	t	•	•	•	•
<i>Macromitrium helmsii</i> Par.	M26170	•	•	t	•	•
<i>Macromitrium ligulare</i> Mitt.	M26171	t	t	t	•	•
<i>Macromitrium retusum</i> Wils. in Hook. f.	M26172	lt	•	•	•	•
<i>Neckera laevigata</i> Hook f. & Wils.	M26173	t	•	•	•	•
<i>Orthorrhynchium elegans</i> (Hook f. & Wils.) Reichdt.	M26174	t	•	•	•	•
<i>Papillaria crocea</i> (Hampe.) Jaeg.	M26175	t	•	•	•	•
<i>Philonotis tenuis</i> (Tayl.) Reichdt.	M26176	sw	•	•	•	•
<i>Plagiomitrium novae-zealandiae</i> (Col.)T. Kop.	M26177	•	w	•	•	•
<i>Polytrichum juniperinum</i> Hedw.	M26178	•	•	s	•	•
<i>Povoirichum oblongifolium</i> (Hook. f. & Wils.) Broth. in Dix.	M26179	•	r	•	•	•
<i>Prychomnion aciculare</i> (Brid.) Mitt.	M26180	t	•	•	•	•

<i>Pyrrhobryum bifarium</i> (Hook.) Manuel	M26181	l	l	•	•	•
<i>Racopilum convolutaceum</i> (C. Muell.) Reichdt.	M26182	tw	srt	•	•	w
<i>Rhizogonium distichum</i> (Sw.) Brid.	M26183	•	l	•	•	•
<i>Sematophyllum contiguum</i> (Mitt.) Mitt. in Seem.	M26184	t	•	•	•	•
<i>Stokesiella praelonga</i> (Hedw.) Robins.	M26185	s	•	•	•	•
<i>Tetraphidopsis pusilla</i> (H. f. & Wils.) Dix.	M26186	t	•	•	•	•
<i>Thamnobryum pandum</i> (H. f. & Wils.) Stone and Scott	M26187	r	rs	•	•	•
<i>Thuidium furfuriosum</i> (H. f. & Wils.) Reichdt.	M26188	s	•	s	•	s
<i>Thuidium laeviusculum</i> (Mitt.) Jaeg.	M26189	w	s	•	•	•
<i>Thuidium sparsum</i> (Hook. f. & Wils.) Jaeg.	M26190	t	lst	•	•	•
<i>Tortula papillosa</i> Wils. in Spruce	M26191	t	•	•	•	•
<i>Tortula princeps</i> De Not.	M26192	•	•	•	•	r
<i>Trachyloma diversinerve</i> Hampe in F. Muell.	M26193	t	t	•	•	•
<i>Trichostomum brachydontium</i> Bruch in F. A. Muell.	M26194	•	•	•	s	•
<i>Weissia controversa</i> Hedw.	M26195	•	•	•	s	s
<i>Seymouria mollis</i> (Hedw.) Broth.	M26196	t	•	•	•	•
<i>Wijkia extenuata</i> (Brid.) Crum	M26197	•	l	•	•	•
<i>Zygodon intermedius</i> B.S.G.	M26198	t	•	•	•	•

Key to distribution chart:

V Valley floor and the valley at the southern end of the reserve on the eastern side of the stream

D *Dysoxylum spectabile* (Kohekohe) forest covering the eastern slopes of the reserve.

R Ridges in the higher levels of the reserve generally covered by scrub or pasture grasses

M Area dominated by macrocarpa. Often with no understorey.

G Grassed slope on eastern side at the northern end of the reserve with some rocky outcrops.

l on logs and stumps

r on rock

s on soil and litter

t on trees and shrubs

w on soil and rock in wetter areas including seepages and banks adjacent to the streams