DRIFT WEED

Every year many tonnes of seaweeds wash up on Wellington's beaches, piling up after certain storms to depths of 1 m or more (Fig. 2). This drift weed includes representatives of sublittoral species that are not usually seen growing. On open beaches all but the toughest weeds tend to be comminuted into barely recognisable fragments, but in deep narrow inshore channels where the waves have lost their force, a wealth of finer material floats gently in, the delicate fronds intact and still retaining their varied natural colours. This is the place to find the most beautiful and some of the rarest of Wellington's seaweeds, though in the world of the scuba diver, more treasures are present. Some species, like the lacy red *Euptilota formosissima*, come in almost every drift; others, like the spectacular *Laingia hookeri*, are found consistently only in certain select spots. The Eastbourne and Muritai shores often yield a rich harvest of fine red weeds.

Bull kelp is common in the drift of the strait, and the big plants last a long time when they lie high and dry. A rare item here is *Carpophyllum plumosum*, interesting because this northern species is not known growing on the Wellington and adjacent west coasts, although it is abundant on the east coast as far south as Cape Palliser.

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Mosses of the Wellington Region

Rodney Lewington[1] and Barbara Polly[1]

INTRODUCTION

Anyone sitting on a mossy bank knows that mosses have a phenomenal capacity to hold water. This gives them advantages over many other plants. Many moss species can also survive drying out and this adds to the range of habitats in which they can compete. With this adaptability it is not surprising that mosses are abundant throughout the world, and Wellington is no exception. They are found on the exposed sea beaches of the coast, in grassland, scrub, and lowland forest, by and in rivers and streams, in the high forest and on the open tops of the Tararua, Rimutaka, and Orongorongo Ranges.

[1] Research Associate, Museum of New Zealand - Te Papa Tongarewa, P.O. Box 467, Wellington.

Within each of these habitats moss species are adapted to specific substrates. Mosses are one of the few groups of plants with species that can survive on bare rock and on the exposed infertile soils of the beach and mountain. Some prefer the bark of trees or logs in various stages of decay and some find their niche high in the branches of trees. By far the greatest volume of mosses, if not the diversity of species, form a permanent cover in the continually moist conditions of streams, gullies, bogs and seepages. Many thrive in the urban environment, living in the crevices of roads and pavements, on walls, tiles and in gutters.

This paper contains descriptions of the more important moss associations in the Wellington Region. For the enthusiast, the moss species recorded for the Wellington Region are listed in the appendix. But the list is never finished. New things are still there to be found. In 1993, Jessica Beever found *Fissidens hyophilus* on trees in Percy's Reserve. A very interesting find because previously this moss had only been found in the far north of the country.

MOSS HABITATS

The Wellington coast has many easily accessible beaches, each with a variety of moss habitats, e.g., at the end of the Wainui Coast Road going east to Barney's Whare, west from Owhiro Bay to Red Rocks and beyond, and at Plimmerton and Makara. In these exposed areas low growing plants with the ability to tolerate wind and salt spray do not have to compete with more vigorous vegetation.

Closest to the sea on sandy coasts among spinifex and pingao can be found *Tortula princeps* and *Triquetrella papillata*. These same mosses also grow in the packed stones among the creeping grasses and scrambling *Muehlenbeckia* which have colonised first and provide the moisture and relative stability needed by the mosses. In the very wet areas where fresh water meets salt to form brackish pools, among the herbaceous mats of *Selliera radicans* and *Samolus repens* can occasionally be found the dull yellow green moss *Drepanocladus aduncus*. Look out for this on the coastal walk to Red Rocks.

Several light-loving moss species survive the salt spray at the back of the beach where seepage forms freshwater pools at the base of cliffs. Here *Thuidium laeviusculum* and *Bryum billardieri* can form thick mats. Their life span must be measured in a few years as their growth lifts the humus and soil above the water table providing conditions where grasses, herbs, and eventually salt tolerant shrubs, can germinate and grow. Eventually these vascular plants will shade out these light-loving mosses.

Seepages over rocks and through the packed detritus that fans from many of the coastal gullies on the Wellington coast are home for several hardy mosses. Typical of these is *Trichostomiopsis australasiae*, a common moss on the coast from Island Bay to Red Rocks. This moss shares its habitat with *Barbula calycina*, *Bryum campylothecium* and *B. dichotomum*, and with sparse grasses and scattered low divaricating shrubs.

On drier, exposed coastal rocks a few mosses manage a precarious existence in crevices. One of these on the Cook Strait coast is *Macromitrium retusum*, found growing on trees in some other places. Other mosses in this habitat include several species of *Bryum*.

Although in earlier days trees must have reached to the beach in many parts of the Wellington coast there are few places where they do now. Only poor remnants of karaka groves now stand in the salt spray zone. One or two mosses make their homes on these trees, often among lichens on the sloping trunks where they are less subject to drying out. One moss found in this situation is *Tortula papillosa*, easily recognised with a magnifying glass by the bead-like gemmae on the tips of many leaves. These green buds are a form of vegetative reproduction.

The coast around Wellington provides access to many steep-sided ravines where streams cut their way from open pasture down to the sea. Common in these open streams is the large *Fissidens rigidulus*. Its brown-green colour and untidy habit, growing half in and half out of the water or on rocks in the spray of waterfalls is easily recognised once known. Another easily recognised moss growing in open running water is *Bryum blandum*. Although less common and less luxuriant than it is in the mountains, the dark green cushions spotted with the young golden yellow tips, can be seen in many streams in the Wellington area.

Above the water level of unshaded streams there are several species of *Fissidens*. You can recognise these by the two rows of leaves, flattened in one plane. With a hand lens you can see the two lobes at the base of each leaf which clasp the stem. *Fissidens* species known in the Wellington area in the open stream habitat include *F. asplenioides*, *F. leptocladus*, *F. dealbatus* and *F. pallidus*. Sharing their habitat is *Philonotis pyriformis* which forms bright green patches in seepages.

Of all the mosses that find a home in open pastures, and for that matter in parks and lawns, *Thuidium furfurosum* is by far the most common. Given adequate moisture this moss will thrive and covers the ground wherever grass or weeds leave a space. Other opportunists in this habitat are *Breutelia affinis*, *Bryum billardieri*, *Campylopus clavatus*, *Stokesiella praelongum* and *Weissia controversa*. On gravel paths and driveways *Trichostomiopsis australasiae* and the silvery-green *Bryum argenteum* find their niche.

On moister banks and the cuttings of tracks where there is full light the apple moss, *Bartramia papillata*, with its fruit like miniature apples, is easily identified. The drier clay banks and cuttings provide a habitat for *Pogonatum subulatum* and *Polytrichadelphus magellanicus*. These are common throughout New Zealand and form large colonies on overhanging banks.

In open forests and on single trees in open situations it is worth looking for the moss *Leptostomum*. Known as saddle mosses, from the habit of forming

a cork like pad on trunks and larger branches, the two local species have distinctive pear shaped capsules and a clear hair-like tip to the leaves. This tip is branched in one species.

Reverting pasture is common in the marginal farmland around Wellington. This, and burnt-over bush, have left areas of gorse and manuka which provide a nursery for native shrubs and trees and a habitat for light-loving mosses. The spurs on the the western edge of Wilton Bush are typical of this habitat. In the early stages of regeneration the gorse and/or manuka will allow only a little light through their canopy. Often this is insufficient for any plant and the ground remains bare. As more light passes through, *Thuidium furfurosum* may become dominant. In damper situations *Thuidium* is joined and eventually replaced by *Ptychomnion aciculare* and *Bryum billardieri*. Less obvious, but quite common, are *Stokesiella praelongum*, *Dicranoloma billardieri*, and *Breutelia pendula*. In this habitat and in many others you will also find mats of *Hypnum cupressiforme*, and the hoary *Campylopus introflexus*.

The more established scrub, such as the stunted manuka, *Cyathodes* and *Dracophyllum* of Browns Track, off the Five Mile Track, is a habitat favoured by *Dicnemon* and *Macromitrium longipes*. These mosses often form a green and russet sleeve around the stunted stems of the shrub species.

The remnants of lowland forest scattered throughout the region provide a variety of environments each with its own association of moss species. In the drier tawa and beech forest the ground cover is often dominated by silver-green hummocks of *Leucobryum candidum*. Where the litter is moister the ubiquitous *Thuidium furfurosum* and *Ptychomnion aciculare* form associations. These same mosses will be found on rotting logs and, with adequate moisture, are occasionally joined by the small umbrella moss, *Hypopterygium rotulatum*.

The most common ground cover in moist lowland forest is *Dicranoloma*. Four species, *D. billardieri*, *D. robustum*, *D. dicarpum* and *D. plurisetum*, can carpet square metres of the forest floor. The darker green *Dicranoloma menziesii* is sometimes found in patches on exposed tree roots and on litter. More often this species grows less luxuriantly on the buttresses and trunks of forest trees. Another is *Wijkia extenuata* which forms a yellow green mat over exposed roots and the adjacent litter. Ever present is the yellow green *Hypnum cupressiforme*, sometimes in single strands and sometimes in its more luxuriant form with pinnate branches, appressed to trunks and buttresses.

The gullies and valleys of the lower, more temperate, areas of the region tend to support a broadleaved forest with a denser canopy and consequently less light than higher altitude forests. Butterfly Creek has some typical areas of this forest with hinau, olearia and some podocarps. Other readily accessible areas in the Wellington Region are at Te Marua, in the Mangaone Valley and, closer to the city, in Wilton Bush.

On well drained slopes of these forests the lack of light, low moisture level

and leaf fall combine to prevent the growth of mosses. This leads to an open floor typical of some denser *Dysoxylum* forest. Even in the moister valley floors, where broadleaved/podocarp mixtures predominate, the forest floor itself will not support mosses because the volume of leaf fall prevents their development. Mosses do, however, thrive wherever a fallen branch, rock or a bank provides a raised situation.

The disturbed sides of a track provide a home for *Thuidium laeviusculum*. With its tolerance for low light and ability to loop along the ground, growing a new plant from the tip of each branch it can quickly colonise bare ground or a log where the canopy has a small break. On banks and track cuttings a little moisture will often allow *Fissidens* spp. to grow. In the Wellington area these include *F. leptocladus*, *F. oblongifolius*, *F. pallidus* and *F. pungens* and, in the same situation, *Pogonatum subulatum*, *Hypnodendron arcuatum*, and *Racopilum convolutaceum*.

A well rotted log in this situation will almost certainly be enveloped in *Thuidium laeviusculum* and through this moss may grow *Pyrrhobryum bifarium*. Less decayed logs are favoured by *Racopilum convolutaceum*, *Ptychomnion aciculare* and *Wijkia extenuata*. Rocks and fallen branches in these broadleaved forests are the substrate for *Echinodium hispidum* and *Hypnodendron arcuatum* as well as for *Racopilum convolutaceum*.

The greater moisture of the valleys allows the trees themselves to support a wider range of moss species than trees of the lower ridges. The base of tree trunks and the exposed roots support *Lopidium concinnum*. Often *Hypnum cupressiforme* and the allied *H. chrysogaster*, mixed with *Lopidium concinnum*, will grow further up the base of the trunk. Also common on the lower trunk are *Camptochaete arbuscula* and the appressed *Orthorrhynchium elegans*. (The latter forms a thin layer of metallic green on smooth-barked trees.) Higher in the trees may sometimes be seen *Macromitrium gracile* and *M. longipes*. The last, when found, will usually be abundant. On smaller branches will occasionally be found tufts of the wrinkle-leaved *Neckera pennata* and *Cryphaea*. The usual *Weymouthia* to be found in the broadleaved forest is *W. cochlearifolia* although *W. mollis* is occasionally found festooning branches and vines.

Tree ferns are common in these moister forests particularly where the canopy has been broken. Their fibrous trunks hold moisture and are favoured by mosses, liverworts and some filmy ferns. Commonly *Cyathea* trunks will support *Hymenodon pilifer*. *Calomnion complanatum*, although usually growing on *Cyathea*, also occurs in the Wellington area on several tree species, including tawa. However, such finds have usually been on trees growing in association with *Cyathea*.

In the wettest areas of lowland forest, stream banks in the gullies provide an ideal habitat for mosses. Silverstream Scenic Reserve, Percy Reserve and Jubilee Park are convenient locations to see such streams. A minimum light level

in such situations allows mosses and liverworts to thrive, forming a continuous covering over soil, rocks, fallen branches and logs, filling hollows and covering the base of trees like a fitted green carpet. *Thuidium*, *Wijkia* and *Ptychomnion* will usually be present with the umbrella mosses, *Hypopterygium rotulatum*, *H. filiculaeforme*, and others such as *Racopilum convolutaceum*, *Echinodium hispidum* and *Acrophyllum dentatum*. Under the darker banks and in shady streams, just above water level, *Cyathophorum bulbosum* is easily identified by its large, unbranched, flattened fronds: each consisting of a row of round-triangular leaves on each side and a single row of smaller leaves on the under side.

On the banks of streams in open forests are *Thuidium laeviusculum*, *Hypnodendron arcuatum*, *Fissidens asplenioides*, *Philonotis tenuis*, and several species of *Bryum*. In the water, *Fissidens rigidulus* and *Thamnobryum pandum* will tolerate a wide range of light levels. In more shaded streams these mosses may be joined by *Cratoneuropsis relaxa* whilst *Calyptrochaeta cristatus* is associated with higher light levels.

In the higher altitudes (above 300 m) of the tawa, red and hard beech forest *Dicranoloma* is still the dominant cover. *D. plurisetum* with its several capsules standing together and *D. billardieri* are the more usual with *D. menziesii* being less common. The moister environment of these higher forests also forms a suitable habitat for *Hypnodendron kerrii*, often associated with *Hypopterygium rotulatum*, *Rhizogonium bifarium* and *Wijkia extenuata*. *Ptychomnion aciculare* is also found here forming smaller colonies, often with *Thuidium furfurosum*.

These mid-elevation beech-tawa forests support the relatively moisture loving ground species, in part because of the often persistent cloud cover. These same conditions provide sufficient moisture for mosses to grow on the trees. It is worth looking above eye level on the trunks and larger branches for *Dicnemon calycinum* and *Macromitrium longipes*. This type of forest is also occasionally moist enough for the festooning *Weymouthia*, although this is more commonly found at higher altitudes and, to a lesser extent, in the sheltered valleys.

Occasionally found in lowland forest are small colonies of the distinctive *Dawsonia suberba*. Each plant of this moss may stand 10 to 20 cm high and, except that they have a blue-green colour, one might be forgiven for mistaking them for pine tree seedlings.

Between 500 m and the bush line in the Tararua, Rimutaka, and Orongorongo Ranges is a zone subject to persistent cloud. Continuous moisture leads to a rich growth of mosses both in the trees and on the forest floor. An ideal access point to this type of habitat is the Akatarawa road on the western side of the summit or, better still, along the summit logging track towards Renata. The ridge north of the Rimutaka Summit trig also has a compact representation of this habitat.

Many lowland mosses also occur at these higher altitudes.*Weymouthia cochlearifolia* and *W. mollis* festoon the branches of the trees, generally silver

beech and kamahi, and hang from the understorey trees such as horopito and stinkwood. Less apparent on branches are *Macromitrium longipes*, *Crosbya straminea*, *Dicnemon calycina*, and *D. semicryptum*. The trunks support *Lembophyllum divulsum*, *Lopidium concinnum*, *Wijkia extenuata*, *Hypnum chrysogaster*, *Campylopus clavatus*, and *Glyphothecium sciuroides* to name only some of the more common mosses. Similarly, the ground cover includes many species: *Dicranoloma billardieri*, *D. plurisetum*, *D. platycaulon*, and *D. menziesii* often form the dominant carpet over forest litter and across the buttresses of trees. *Leucobryum candidum* forms more extensive mats than it does at lower levels whilst *Ptychomnion aciculare* will form large patches on stumps and well rotted logs.

Notable for its scarcity in the area is the large moss *Dendroligotrichum dendroides*, reported only from the slopes of Mt. Alpha in the far north of the Wellington Region. Only a little further north this moss is more common and found at lower altitudes. Banks and road cuttings in this higher area support *Polytrichadelphus magellanicus*, *Pogonatum* and *Polytrichum juniperinum*, and the disturbed areas at the sides of roads and tracks are occasionally home for *Atrichum androgynum*.

The Wellington Region provides only a token sub-alpine area and consequently the mosses associated with this habitat are not well represented. The Rimutaka Summit is by far the easiest sub-alpine habitat to reach in the Wellington Region. On the track between the road and the trig are several colonies of hoary *Racomitrium lanuginosum* and, at the summit, *Andraea acutifolia* var. *acuminata* and *A. acutifolia*. These form reddish brown, almost black, tufts on the bare rock whereas the brownish green tufts are *Racomitrium crispulum*. The roadside cliffs below the summit are worth exploring for *Grimmia* and its allied species, *Schistidium apocarpus*.

Sphagnum is an easily recognised moss, familiar to gardeners in the dried form. To thrive it requires acid, boggy conditions with good light. One of the few unmodified swamp associations known to the authors is at about 550 m on the southern approach to the Marchant Ridge. Below Dobsons Hut the track leaves a forest of stunted silver beech and skirts a patch of bright lime green *Sphagnum falcatulum*. Around reeds and small shrubs rise hummocks of *Sphagnum cristatum*. The new growth on each plant forms rusty brown flower-like tips, contrasting with the paler brown of the lower leaves. On the drier hummocks grows *Campylopus introflexus*, recognised by the hoary look given by the reflexed hairs on each leaf. Also on these hummocks are *Dicranoloma billardieri* and *Wijkia extenuata*. Around the edges of this bog, in the shade of the *Dracophyllum* and stunted kamahi, can be found *Distichophyllum pulchellum*, *Ptychomnion aciculare*, the small umbrella moss *Hypopterygium rotulatum* and *Cyathophorum bulbosum*. All of these grow on a raft of leaf litter riding on the water of the swamp.

MOSS LIST

The description of the moss flora and the full list of moss species given in the Appendix are, of necessity, incomplete. They are based on searches of the literature and herbaria supplemented by personal observations.

It has become very apparent in preparing the material that any study of local mosses will identify further species and show that known species have a far wider range of habitats than existing records suggest. It is hoped that the publication of the list will generate a more widespread interest in Wellington Region mosses and lead to an increase in our knowledge.

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Appendix 1: Mosses Recorded in the Wellington Region

The mosses named below have been recorded as being found in the Wellington Area. This area is bounded by the Waikanae River, Reikorangi, Kapakapanui, Renata, Alpha and and Omega in the north. The main ridges of the Tararua and Rimutaka Ranges form the western boundary. At The Peak, south of Mt Matthews the boundary turns east to meet the Wairarapa coast. The islands of Kapiti and Mana are included.

Where the information is adequate the habitat has been noted. In most other cases it has only been possible to note the location. A few, generally older, herbarium records have very limited information and in these cases the moss is noted as "Not specified"

All names used are from Beever et al. 1992.

KEY TO HABITATS

C	Coastal
BP	Broadleaved-Podocarp forest
No	Lowland beech forest
UF	Unspecified lowland forest
NW	Highland beech and *Weinmannia* forest
Sa	Sub-alpine
Ss	Streamside
Su	Stream, submerged
Sw	Swamp
Sc	Scrub
OP	Open Pasture and grass verges
Ur	Urban
UrB	Wellington Botanic Gardens

Species	**Habitat**										
Acaulon integrifolium									Ur		
Achrophyllum dentatum	BP	No		NW		Ss					
A. quadrifarium	BP	No			Sa						
Acrocladium chlamydophyllum	BP	No						Sc			
A. cuspidatum		No				Ss					
Amblystegium riparium	BP					Ss	Su				
Andreaea acutifolia					Sa						
A. acutifolia subsp. *acuminata*					Sa						
Atrichum androgynum	BP	No	UF	NW							
Barbula calycina	C										Akatarawa Saddle
B.crinita											Mana I.
B. torquata									OP		
Bartramia papillata	BP										
Akatarawa											
Brachythecium albicans									OP		
B. plumosum			UF	NW							
B. rutabulum	BP					Ss					
B. salebrosum	BP										
Breutelia affinis							Sw		OP		
B. elongata				NW							
B. pendula	BP			NW			Sw	Sc			

Bryoerythrophyllum jamesonii	C	BP													
Bryum argenteum					NW								Ur		
B. billardieri	C	BP	No	UF							Sc	OP	Ur		
B. blandum		BP		UF	NW		Ss								
B. caespiticium				UF			Ss								
B. campylothecium	C											OP	Ur		Mana I.
B. dichotomum		BP		UF											
B. erythrocarpoides				UF											
B. laevigatum	C			UF	NW		Ss		Sw	Sc			Ur		
B. sauteri															Mana I.
Buxbaumia aphylla						Sa									
B. novae-zealandiae		BP					Ss								
Calomnion complanatum		BP	No		NW										
Calyptopogon mnioides		BP			NW										
Calyptochaete brownii		BP													
C. cristata		BP			NW		Ss	Su							
C. flexicollis					NW										
Camptochaete angustata		BP													
C. arbuscula		BP	No		NW										
C. gracilis		BP		UF	NW		Ss								
C. pulvinata		BP					Ss								
Campylium polygamum				UF											
Campylopodium medium		BP			NW							OP			
C. lineare				UF			Ss								
Campylopus acuminatus									Sw						
C. clavatus			No		NW						Sc	OP		UrB	
C. introflexus		BP	No		NW				Sw	Sc		OP		UrB	
C. pyriformis		BP													
Catagonium nitens		BP			NW										
Catharomnion ciliatum		BP		UF											
Ceratodon purpureus	C	BP	No		NW							OP	Ur		
Chrysoblastella chilensis					NW										
Cladomnion ericoides		BP	No		NW										
Cratoneuropsis relaxa		BP		UF			Ss	S?							
Crosbya straminea		BP		UF	NW										
Cryphaea dilatata		BP	No		NW										
C. tasmanica				UF			Ss								
C. tenella			No												
Cryptopodium bartramioides			No	UF	NW										
Cyathophorum bulbosum		BP	No		NW		Ss	Su							
Cyrtopus setosus		BP													
Daltonia splachnoides		BP													
Dawsonia superba		BP		UF	NW										
Dendroligotrichum dendroides					NW										
Desmatodon convolutus	C														
Dichelodontium nitidum			No	UF										UrB	
Dicnemon calycinum		BP	No		NW										
D. semicryptum					NW										
Dicranella clathrata				UF											
Dicranoloma billardieri		BP	No		NW						Sc				
D. cylindropyxis			No		NW										
D. dicarpum		BP	No		NW										
D. menziesii		BP	No		NW										
D. platycaulon					NW										
D. plurisetum		BP	No		NW						Sc				
D. robustum		BP	No		NW										

Dicranoweisia antarctica					NW												
Dicranum trichopodum		BP	No														
Distichium capillaceum																	Rimutaka Hill
Distichophyllum microcarpum		BP		UF													
D. pulchellum		BP		UF	NW												
D. rotundifolium		BP		UF	NW												
Ditrichum cylindricarpum		BP	No														
D. difficile		BP	No		NW										UrB		
D. punctulatum		BP	No	UF													
Drepanocladus aduncus	C			UF				Sw									
D. fluitans																	Hutt Valley
Echinodium hispidum		BP	No		NW		Ss										Kapiti I.
E. umbrosum		BP		UF													
Entosthodon acaulis				UF			Ss										
E. subnudus											OP						
Eriodon cylindritheca		BP	No														
Eurynchium asperipes		BP															
E. austrinum		BP						Su									
E. muriculatum		BP													UrB		
Fabronia australis				UF													
Fissidens anisophyllus		BP		UF			Ss										
F. asplenioides		BP		UF	NW		Ss			Sc					UrB		
F. dealbatus		BP		UF			Ss										
F. linearis		BP		UF													
F. hylogenes		BP		UF													
F. hyophilus		BP															
F. leptocladus		BP		UF			Ss										
F. oblongifolius		BP															
F. pallidus		BP		UF			Ss										
F. pungens		BP		UF							OP				UrB		
F. rigidulus		BP	No				Ss	Su									
F. taylorii		BP					Ss										Mana I.
F. tenellus		BP		UF			Ss							Ur			
F. vittatus							Ss										
Funaria hygrometrica				UF					Sw					Ur			
Glyphothecium sciuroides		BP	No		NW												
Goniobryum subbasilare					NW												
Grimmia pulvinata					NW									Ur			
G. trichophylla		BP															
Hampeella alaris			No		NW												
Hedwigia ciliata				UF													
Holomitrium perichaetiale	C	BP		UF	NW				Sw								
Homalia falcifolia		BP		UF													
Hymenodon pilifer		BP		UF	NW												
Hymenostomum patulum				UF													
Hypnodendron arcuatum		BP		UF			Ss										
H. comatum		BP	No		NW												
H. kerrii		BP		UF													
H. marginatum		BP		UF			Ss		Sw								
H. menziesii		BP	No	UF													
H. spininervium		BP															
Hypnum chrysogaster		BP		UF													
H. cupressiforme		BP	No		NW						OP				UrB		
H. cupressiforme var. *filiforme*		BP	No		NW												
Hypopterygium commutatum		BP		UF			Ss		Sw								

H. filiculaeforme		BP		UF	NW		Ss							
H. rotulatum		BP	No	UF			Ss			Sc				
Ischyrodon lepturus	C													
Lembophyllum divulsum		BP			NW									
Leptobryum pyriforme												Ur		
Leptodon smithii		BP		UF			Ss							
Leptodontium interruptum											OP	Ur		Mana I.
Leptostomum inclinans		BP	No	UF										
L. macrocarpum		BP		UF								Ur		
Leptotheca gaudichaudii			No											
Leucobryum candidum		BP	No		NW									
Lopidium concinnum		BP		UF	NW		Ss							
Macrocoma tenue		BP		UF									UrB	
Macromitrium gracile		BP	No	UF										
M. helmsii		BP												
M. ligulaefolium				UF										
M. ligulare		BP	No											
M. longipes		BP	No		NW									
M. microstomum		BP	No	UF										
M. prorepens		BP		UF	NW									Mana I.
M. retusum	C	BP												
M. submucronifolium	C	BP		UF										
Meesia muelleri														Tararuas
Mittenia plumula				UF										
Neckera laevigata		BP		UF										
N. pennata		BP		UF										
Oligotrichum tenuirostre			No		NW									
Orthodontium lineare		BP												
Orthorrhynchium elegans		BP	No	UF										
Orthotrichum hortense		BP												
O. tasmanicum				UF										
Papillaria crocea		BP		UF										Kapiti I.
P. flavo-limbata				UF	NW									
P. flexicaulis		BP												
Pendulothecium oblongifolium		BP					Ss							
P. punctatum		BP					Ss						UrB	
Philonotis pyriformis				UF	NW		Ss							
P. scabrifolia		BP					Ss							
P. tenuis	C	BP		UF	NW		Ss					Ur		Mana I.
Physcomitrium pyriforme											OP			
Plagiomnium novae-zealandiae		BP		UF	NW		Ss	Su	Sw					
Plagiothecium denticulatum				UF										
Pleuridium nervosum											OP		UrB	
P. subulatum				UF										
Pogonatum subulatum		BP			NW								UrB	
Pohlia nutans				UF	NW									
P. ochii					NW									
Polytrichadelphus magellanicus		BP		UF	NW		Ss							
Polytrichum commune									Sw	Sc				
P. formosum					NW									
P. juniperinum					NW						OP			Kapiti I.
Pottia truncata											OP			
Psilopilum crispulum				UF										Tararuas
Ptychomitrium australe	C													
Ptychomnion aciculare		BP	No		NW		Ss			Sc				
Pyrrhobryum bifarium		BP	No		NW		Ss							

P. mnioides						NW		Ss			Sc						
Racomitrium crispulum					UF	NW	Sa	Ss									
R. lanuginosum							Sa										
Racopilum convolutaceum		BP	No			NW		Ss									
Rhacocarpus purpurascens			No			NW	Sa										
Rhizogonium distichum		BP			UF	NW											
R. novae-hollandiae						NW											
Rhynchostegium tenuifolium		BP			UF						Sc			UrB	Mana I.		
R. laxatum		BP									Sc			UrB			
Sauloma tenella		BP			UF			Ss									
Schistidium apocarpum					UF			Ss									
Schizymenium bryoides														UrB			
Sematophyllum amoenum		BP	No			NW		Ss					Ur		Kapiti I.		
S. contiguum		BP	No														
S. homomallum	C																
S. jolliffii		BP															
S. subcylindricum						NW											
S. uncinatum		BP				NW		Ss									
Sphagnum cristatum						NW											
S. falcatulum						NW	Sa			Sw							
Stokesiella praelonga		BP				NW					Sc	OP			Mana I.		
Tayloria calophylla					UF						Sc						
T. purpurascens						NW											
Tetraphidopsis pusilla		BP				NW											
Thamnobryum pandum		BP				NW		Ss	Su								
Thuidium furfurosum		BP	No					Ss			Sc	OP					
T. laeviusculum		BP						Ss			Sc		Ur				
T. sparsum			No														
Tortella knightii		BP			UF												
Tortula muralis					UF								Ur				
T. papillosa	C	BP											Ur				
T. phaea															Clay bank		
T. princeps	C	BP													Mana I.		
T. rubra	Not specified																
Trachyloma diversinerve		BP															
T. planifolium		BP			UF	NW											
Trematodon suberectus	Not specified																
Trichostomiopsis australasiae	C												Ur				
Tridontium tasmanicum		BP			UF												
Triquetrella papillata	C				UF			Ss				OP		UrB			
Ulota laticiliata						NW											
U. lutea						NW											
Weissia controversa	C	BP				NW						OP	Ur				
W. controversa var. *gymnostoma*		BP															
Weymouthia cochlearifolia		BP	No			NW											
W. mollis		BP	No			NW											
Wijkia extenuata		BP	No			NW					Sc						
Wilsoniella blindioides						NW											
Zygodon intermedius		BP			UF	NW								UrB			
Z. menziesii		BP															
Z. minutus					UF												
Z. obtusifolius			No														