

THE ALTITUDINAL VEGETATION PATTERN, WINDBAG VALLEY, SOUTH WESTLAND

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Introduction

The following notes provide a summary of the main altitudinal forest pattern present on the southeast side of Windbag Valley near Konini Creek (Mataketake Ecological District) and are based on a visit to the area on 8-10 February 1988 in good weather. The altitudinal transect started at grid reference NZMS1 S87 135271, crossed Konini Creek at 138263, and then proceeded straight up the ridge to timberline at 156244. Sample sites were approximately 200 m altitudinally apart. A species list is appended with a total of 117 species recorded (40 ferns and fern allies, 4 conifers, 57 dicotyledonous angiosperms and 16 monocotyledonous angiosperms: at least three additional *Uncinia* species were not identified). Only two naturalised species were recorded, both from the lowest site.

Site 1: 45 m

This site is located on the valley floor adjacent to the Windbag River. A few small streams cross the site flowing towards the river. Some canopy trees have been felled, presumably during road construction. The forest canopy consists of *Nothofagus menziesii* (25 m tall, 60% cover) with occasional *Dacrycarpus dacrydioides*. The sparse subcanopy comprises scattered *Pseudopanax crassifolius*, *Coprosma rotundifolia* and *Pennantia corymbosa*. The shrub layer is quite dense with *Pseudowintera colorata*, *Coprosma* species, *Pseudopanax crassifolius* and *Pseudopanax anomalous* dominant. *Blechnum procerum*, *Polystichum vestitum*, and *Asplenium bulbiferum*, together with *Microlaena avenacea* comprise a dense forest floor plant cover (80%+ cover). 65 species were recorded.

Site 2: 250 m

This site is located on a broad face below the main ridge. Aspect northwest, slope 10-15°. The canopy at about 30 m is dominated by *Weinmannia racemosa* with abundant climbing plants including *Metrosideros diffusa*, *Ripogonum scandens* and *Metrosideros fulgens*. Together these form a dense canopy layer (cover 80%). *Dacrydium cupressinum* occurs as a scattered emergent to 35 m+ above this. The subcanopy (5-20 m) is also quite dense (50% +

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cover) and is dominated by *Hedycarya arborea* and *Cyathea smithii*, with *Weinmannia racemosa* and *Griselinia littoralis* also important. The shrub tier (1-2 m) is sparse, consisting primarily of tree ferns. The forest floor plant cover is dominated by ferns, especially *Cyathea smithii*, *Lastreopsis hispida*, *Leptopteris hymenophylloides* and *Blechnum discolor*. However, litter was the dominant forest floor cover (70%). The low radiation light environment in the lowest part of the forest results from the dense canopy and subcanopy layers. 48 species were recorded.

Site 3: 450 m

This site is located on a broad spur up to 25 m wide with an aspect of 305° and a slope of 10-15°. The canopy at 30-35 m is dominated by *Nothofagus menziesii* with some *Metrosideros umbellata*. Occasional *Weinmannia racemosa* and *Podocarpus hallii* are also present (canopy cover about 60%). Vines of both *Metrosideros diffusa* and *Metrosideros fulgens* are common. The subcanopy at 15-25 m is dominated by *Weinmannia racemosa* with occasional *Podocarpus hallii* and *Metrosideros umbellata* also present. A lower subcanopy layer (4-5 m) of *Podocarpus hallii*, *Coprosma foetidissima*, *Griselinia littoralis*, *Weinmannia racemosa* and *Coprosma* species is also present. As with sites 4 and 5, the shrub layer (up to 4 m) is virtually absent. The ground cover consists of dense *Blechnum discolor* (70%) and litter (30%). *Tmesipteris tannensis* is common around the base of large canopy trees (*Nothofagus menziesii* and *Metrosideros umbellata*) and on fallen logs. 45 species were recorded.

This site appears to have been browsed very heavily with virtually no plants in the shrub tier and a dense ground cover of *Blechnum discolor*. Seedlings of *Pseudopanax simplex* and *Griselinia littoralis* are restricted to inaccessible logs or grow as epiphytes.

Site 4: 650 m

This site is located higher up the spur and is physiognomically similar to site 3. Aspect 280°; slope 5°. The spur is about 25 m wide and slightly convex. The canopy at 25 m (60% cover) is dominated by *Nothofagus menziesii* and *Metrosideros umbellata* and occasional *Podocarpus hallii* and *Weinmannia racemosa*. The subcanopy is dominated by *Weinmannia racemosa*, *Pseudopanax simplex* and *Griselinia littoralis*. Again the shrub tier is almost non-existent, with *Pseudowintera colorata* the only species present. The forest floor is dominated by *Blechnum discolor* (60%) and litter (40%). As in common with sites 3 and 5, there is abundant evidence of severe deer browse in the forest. 39 species were recorded.

Site 5: 850 m

This site is on a gently sloping convex face below the ridge crest. Aspect 320°; slope 10-15°, increasing to 15-20° further down. The canopy at about 20 m is dominated totally by *Nothofagus menziesii* (cover 70%), consisting mainly of trees are up to 50-60 cm dbh together with a few very large trees (70 cm dbh+) and some old rotting stumps. The subcanopy at about 10 m (50-60% cover) is dominated by *Pseudopanax simplex*, *Griselinia littoralis* and *Nothofagus menziesii*. The shrub tier (to 3 m) is again very sparse, with *Pseudowintera colorata* the only species present. The forest floor is 70% litter, 10% rock and 20% bryophytes and *Uncinia*. Abundant evidence of grazing is present with *Pseudopanax simplex* present only as seedlings and mature trees. *Griselinia littoralis* is heavily browsed when present within browse height, but is mainly restricted to large trees. Extensive tracking on the ground is also evident. 34 species were recorded.

Site 6: 1050 m

This site is a gently sloping concave face below the narrow ridge. Timberline is at 1100 m. Aspect 320°; slope 15-20°. The canopy is entirely *Nothofagus menziesii* at about 15 m. Canopy cover is about 75%. Many trees are large and quite gnarled, although smaller straight growing trees are also present. The shrub tier is of variable height and cover, extending up to about 5 m. The dominant species include *Nothofagus menziesii*, *Archeria traversii*, *Dracophyllum traversii*, *Coprosma pseudocuneata* and *Brachyglottis buchananii*. The forest floor is covered is a dense carpet of bryophytes and the two filmy ferns *Hymenophyllum multifidum* and *Hymenophyllum villosum* (cover 95-100%). The bryophyte-fern cover continues up the lower boles of the larger trees. 19 species were recorded.

General Comments

The following species were recorded in the scrub at timberline (1100-1150 m): *Halocarpus biformis*, *Dracophyllum longifolium*, *Dracophyllum uniflorum*, *Pseudopanax colensoi*, *Olearia lacunosa*, *Brachyglottis buchananii*, *Coprosma pseudocuneata*, *Olearia colensoi*, *Phormium cookianum*, *Coprosma serrulata*, *Chionochloa pallens*, *Celmisia armstrongii*, *Dracophyllum traversii*, *Myrsine nummularifolia*, *Hebe* (cf *subalpina*), *Coprosma cuneata*, *Pittosporum crassicaule*, *Gaultheria crassa*, *Coprosma* sp (a) (c.f. *pseudocuneata*) and *Coprosma ciliata*.

Bird-life is amongst the best I have seen in this part of South Westland. Kaka are quite abundant in the forest with one pair

following us up the ridge. Parakeet were present at site 4. Keas were also seen. Other birds seen or heard included tui, fantail, tomtit, kereru, cuckoo, bellbird, grey warbler and rifleman.

The most disturbing aspect of this area is the very high impact that deer have had and still appear to be having on the mid-slope forest, especially between about 400-900 m. The shrub layer is virtually absent from this zone, and must in the long-term lead to pronounced change in floristic composition of the forest including the canopy. Given the important natural values of the Paringa-Windbag area, this impact of grazing animals (which is presumably more widespread than just the site we visited) must be looked on with considerable concern.

Species list

site:	1	2	3	4	5	6
FERNS AND FERN ALLIES						
<i>Asplenium bulbiferum</i>	.					
<i>Asplenium flaccidum</i>
<i>Asplenium polyodon</i>	.	.	.			
<i>Blechnum</i> sp. (blackspot)	.		.			
<i>Blechnum chambersii</i>	.					
<i>Blechnum discolor</i>	
<i>Blechnum fluviatile</i>	.			.	.	
<i>Blechnum minus</i>	.					
<i>Blechnum nigrum</i>		.				
<i>Blechnum procerum</i>	
<i>Blechnum vulcanicum</i>	.					
<i>Ctenopteris heterophylla</i>	.		.			
<i>Cyathea colensoi</i>					.	
<i>Cyathea smithii</i>		
<i>Dicksonia squarrosa</i>		
<i>Grammitis billardierei</i>	
<i>Grammitis magellanica</i>					.	
<i>Histiopteris incisa</i>		
<i>Hymenophyllum demissum</i>	
<i>Hymenophyllum ferrugineum</i>		.				
<i>Hymenophyllum flabellatum</i>		
<i>Hymenophyllum multifidum</i>
<i>Hymenophyllum rarum</i>	.			.		
<i>Hymenophyllum revolutum</i>		.	.			
<i>Hymenophyllum rufescens</i>				.	.	
<i>Hymenophyllum sanguinolentum</i>		
<i>Hymenophyllum villosum</i>						.
<i>Hypolepis millifolium</i>	.				.	.
<i>Lastreopsis hispida</i>		.				
<i>Leptopteris hymenophylloides</i>		.	.			
<i>Leptopteris superba</i>	.			.	.	
<i>Lindsaea trichomanoides</i>		
<i>Lycopodium varium</i>				.	.	.

<i>Paesia scaberula</i>	.	.	.	.
<i>Phymatosorus diversifolius</i>	.	.	.	.
<i>Polystichum vestitum</i>	.	.	.	.
<i>Rumohra adiantiformis</i>	.	.	.	.
<i>Tmesipteris tannensis</i>	.	.	.	.
<i>Trichomanes strictum</i>	.	.	.	.
<i>Trichomanes venosum</i>	.	.	.	.

CONIFERS

<i>Dacrycarpus dacrydioides</i>	.	.	.	.
<i>Dacrydium cupressinum</i>	.	.	.	.
<i>Podocarpus hallii</i>	.	.	.	.
<i>Prumnopitys ferruginea</i>	.	.	.	.

DICOTYLEDONS

<i>Alepis flavida</i>	.	.	.	.
<i>Alseuosmia pusilla</i>	.	.	.	.
<i>Archeria traversii</i>	.	.	.	.
<i>Aristotelia fruticosa</i>	.	.	.	.
<i>Aristotelia serrata</i>	.	.	.	.
<i>Brachyglottis buchananii</i>	.	.	.	.
<i>Cardamine debilis</i>	.	.	.	.
<i>Carmichaelia arborea</i>	.	.	.	.
<i>Carpodetus serratus</i>	.	.	.	.
<i>Coprosma ciliata</i>	.	.	.	.
<i>Coprosma colensoi</i>	.	.	.	.
<i>Coprosma cuneata</i>	.	.	.	.
<i>Coprosma foetidissima</i>	.	.	.	.
<i>Coprosma lucida</i>	.	.	.	.
<i>Coprosma propinqua</i>	.	.	.	.
<i>Coprosma pseudociliata</i>	.	.	.	.
<i>Coprosma pseudocuneata</i>	.	.	.	.
<i>Coprosma rhamnoides</i>	.	.	.	.
<i>Coprosma rigida</i>	.	.	.	.
<i>Coprosma rotundiifolia</i>	.	.	.	.
<i>Coprosma</i> sp. (aff. <i>parviflora</i>)	.	.	.	.
<i>Dracophyllum traversii</i>	.	.	.	.
<i>Elaeocarpus hookerianus</i>	.	.	.	.
<i>Fuchsia excorticata</i>	.	.	.	.
<i>Griselinia littoralis</i>	.	.	.	.
<i>Hedycarya arborea</i>	.	.	.	.
<i>Hoheria glabrata</i>	.	.	.	.
<i>Melicytus ramiflorus</i>	.	.	.	.
<i>Metrosideros diffusa</i>	.	.	.	.
<i>Metrosideros fulgens</i>	.	.	.	.
<i>Metrosideros perforata</i>	.	.	.	.
<i>Metrosideros umbellata</i>	.	.	.	.
<i>Muehlenbeckia australis</i>	.	.	.	.
<i>Myrsine divaricata</i>	.	.	.	.
<i>Neomyrtus pedunculata</i>	.	.	.	.
<i>Nertera</i> aff. <i>dichondrifolia</i>	.	.	.	.
<i>Nertera depressa</i>	.	.	.	.
<i>Nothofagus menziesii</i>	.	.	.	.
<i>Olearia ilicifolia</i>	.	.	.	.
<i>Olearia lacunosa</i>	.	.	.	.
<i>Parsonsia</i> sp.	.	.	.	.
<i>Pennantia corymbosa</i>	.	.	.	.

