FOREST AND SCRUB FLORA OF THE UPPER RANGITATA, RAKAIA AND WILBERFORCE VALLEYS

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Over the last two and half decades I have made trips into all the main tributaries of the Rangitata River as well as the upper Rakaia and Wilberforce Valleys. Speight, Cockayne and Laing (1910), published a flora for the upper Rakaia, but there has been no account, previously, of the forest and scrub flora of the other valleys. Below are floristic lists, no doubt incomplete, for these areas, and notes on certain species.

Podocarpus hallii is generally but patchily distributed through each of the valleys but was much more extensive before widespread fires in pre-European times and after. Many grass or scrub-covered slopes are still littered with logs.

Nothofagus solandri var cliffortioides is also discontinuously present, extending some distance up all of the valleys and, again, there are ample signs of its wider occurrence prior to Polynesian and European fires. In the Rangitata it occurs in most of the streams near Mesopotamia, with a larger stand, badly wind-damaged, on Brabazon Downs. There are indications, in this area, of hybridization with N. fusca. Small stands of mountain beech occur in Alma Stm and, further up the Havelock, between Murphy and Carney Stms, where there is a contact with mountain totara forest. There is no beech on the N. bank. In the Clyde, very small patches of mountain beech are present on the S. bank just downstream of the old Broadleaf Hut. On the N. bank larger patches extend from Stronechrubie (Macrae's homestead) to just below Black Bluff. In the Lawrence, beech forest is discontinuously present from Stronechrubie to about 1.5 km downstream of Hermitage Hut, where there is a good contact with mountain totara forest.

The main upper Rakaia is notable for vigorously-regenerating Nothofagus menziesii in numbers of tributaries of the Lake Stm. (Downs Hut Stm and the next stream to the S. Bush Stm and Charlies Stm) as well as on Prospect Hill and in Lower Washbourne Stm. Mountain beech is also common in the Lake Stm. There is no beech further W. than the Lower Washbourne on the S. bank. On the N. bank mountain beech extends to about 3.5 km W. of Manuka Point. The Wilberforce Valley has, on its S. bank, more continuous beech forest than is present in the Rangitata and upper Rakaia. Beech extends to about 4 km upstream of the Moa Stm confluence (where red x mountain beech hybrids are present) and, in the Moa Catchment, there are good contacts with mountain totara forest about $1\frac{1}{2}$ km downstream of North Stm. On the N. bank, where forest is less continuous, the last beech occurs between Fanghill and Bristed Stms.

Metrosideros umbellata is spottily distributed in the Rangitata (at Bush Stm near Mesopotamia, Alma Stm, Murphy Stm and Freezing Point Stm in the Havelock, just E. of the Sinclair R. in the Clyde). In

the upper Rakaia it is present at a stream below Mt. Medhurst and at Jellicoe Stm. In the Wilberforce it is common (with Weinmannia racemosa and other species indicative of specially favourable conditions) in the Kiwi and Moa Stms.

Only one plant of Dracophyllum traversii is known in the Rangitata, near a tarn at the McCoy confluence with the Clyde. It is not yet known from the Upper Rakaia but may occur in some N. bank tributaries. It is common in Moa Stm, in the Unknown R. and Wilberforce R. above the Unknown. Similarly, Libocedrus bidwillii is not known yet in the Rangitata, is known (with Archeria traversii) from a small stand between the Reischek Hut and Reischek R., in the upper Rakaia (but may occur in some N. bank tributaries) and is common in the Moa Stm and up-valley in the Wilberforce, along with Dacrydium biforme. Olearia colensoi, present in the upper Wilberforce, is known in only one other place (White R. in the Waimakariri headwaters) in Canterbury.

These distributions suggest that the Wilberforce Valley, with its rich forest and scrub flora, is climatically the least severe of the valleys and almost certainly receives the heaviest rainfall. The Mathias Valley, which I have not visited, apparently is similar to the Wilberforce (E. Porter pers. comm.). It may be, however, that the depauperate state of the Rangitata flora, by comparison with the Wilberforce, is because it has been more comprehensively burnt, although the gradient of decreasing favourability for forest continues southward into the Godley and Macaulay Catchments.

A very interesting feature of the upper Rangitata - Rakaia - Mathias - Wilberforce Catchments is the presence on valley flats and fans of some large stands of tall Phyllocladus alpinus scrub (or low forest), with or without Podocarpus hallii. This type of vegetation was abundant throughout the Canterbury mountains from soon after the end of the Otira glaciation until replaced by beech forest in the mid to latter part of the post-glacial. In the Waimakariri it is confined to some tiny islands in a sea of beech (except for one large stand in the head of the Thompson R., Poulter Catchment). It survives extensively in the Wilberforce, Mathias and N. bank of the upper Rakaia and fairly large patches occur also on the S. bank of the upper Rakaia and in the upper Rangitata valleys. The Phyllocladus - mountain totara forest of the upper valleys gave way to mountain totara/matai forest on lower country and in some places this survived until the Polynesian era (although invasion by beech forest had occurred earlier). Apart from abundant fossil evidence for the matai forest, present, for example in sediments from a bog at the Harper R. and on the shores of Lake Coleridge, there are still signs in the flora of the ancient matai forests. The matai trees in the beech forest at Mt Algidus are the only ones still surviving so far inland in Canterbury and the rich forest flora at Algidus and further up-valley is in concert with this. Round Lake Coleridge there are still numbers of living southern rata trees. There is a link with the former matai forests of the foothills and upper Canterbury Plains through the forest in the Rakaia Gorge, which still has a few surviving matai.

The variety of the forest flora near Mesopotamia in the Rangitata links the upper valley systems, with their subalpine floristic assemblage, and the lowland forest at Mt Peel. We have no evidence from the Mesopotamia area, but it would not be surprising to know that matai once grew there.

TABLE 1: DISTRIBUTION OF THE FOREST FLORA

Rangitata Catchment

A	Upper Havelock Valley, above Forbes R.
B	Upper Clyde Valley, above Sinclair R.
C	Lower Havelock Valley, Alma Stm to Forbes R. on S. bank, Erewhon Forks to Darkie Jim's Bush on N. bank.
D	Lower Clyde Valley, Erewhon Forks to Dog Kennel Hut on S. bank, Lawrence R. to Sinclair R. on N. bank.
E	Lawrence Valley
F	S. bank of Main Rangitata, Forest Ck to Alma Stm.

Wilberforce Catchment

W	Upper Wilberforce, above Unknown R.
X	Lower Wilberforce, Mt Algidus to Unknown R.

Rakaia Catchment

(includes only species not listed by Speight, Cockayne and Laing 1910)

Y	Rakaia Head, above Reischek Stm.
Z	Mid upper Rakaia, Lake Stm to Reischek Stm.

	A	B	C	D	E	F	W	X	Y	Z
Acaena fissistipula			C	D	E	F	W	X		
Archeria traversii							W	X		
Aristotelia fruticosa	A	B	C	D	E	F	W	X		
A. serrata			C			F	W	X		Z
Asplenium bulbiferum								X		
A. flabellifolium			C	D	E	F		X		
A. flaccidum			C	D	E		W	X		
A. hookerianum			C		E	F		X		
A. richardii			C	D		F		X		
A. trichomanes	A			D	E	F				
Astelia fragrans				D		F			Y	
A. nervosa			C				W	X		
Blechnum aggregatum								X		
B. discolor								X		
B. fluviatile						F	W	X		
B. penna-marina			C		E		W	X		
B. "procerum"	A	B	C			F	W	X		
B. vulcanicum								X	Y	
Brachycome thomsonii				D	E			X		

	A	B	C	D	E	F	W	X	Y	Z
Calystegia tuguriorum			C							
Cardamine debilis								X		
Carex cf forsteri						F		X		
Carmichaelia grandiflora	A	B	C		E		W	X		
Carpodetus serratus						F		X		
Cassinia fulvida						F				
C. vauvilliersii	A	B	C	D	E		W	X		
Cheilanthes sp.						F				
Chiloglottis cornuta								X		
Chionochloa conspicua	A	B	C			F	W	X	Y	Z
Clematis paniculata								X		
C. marata								X		
Coprosma banksii							W			
C. ciliata	A		C				W	X		
C. crassifolia						F				
C. depressa	A	B	C				W	X		
C. "dumosa"	A	B	C	D	E				Y	Z
C. foetidissima							W	X		
C. linariifolia				C		E F	W	X		

	A	B	C	D	E	F	W	X	Y	Z
C. lucida								X		
C. microcarpa								X		Z
C. "parviflora"	A	B	C		E	F	W	X		
C. propinqua		B	C		E	F		X		
C. pseudocuneata	A	B	C				W	X		
C. rhamnoides						F		X		
C. rugosa	A	B	C	D	E		W	X		
C. serrulata	A	B					W			
Cordyline australis			C					X		
Corokia cotoneaster					E	F		X		
Corybas triloba			C					X		
Cyathea colensoi							W	X		
Cyathodes juniperina						F		X		
Cystopteris fragilis			C	D	E	F				
Dacrydium bidwillii		B			E			X		
D. biforme							W	X		
Discaria toumatou			C	D	E	F	W	X		
Dracophyllum kirkii	A	B	C		E		W	X		

	A	B	C	D	E	F	W	X	Y	Z
D. longifolium	A	B	C	D	E		W	X		
D. traversii		B					W	X		
D. uniflorum	A	B	C	D	E		W	X		
Elaeocarpus hookerianus								X		
Elytranthe flavida						F				
E. tetrapetala			C					X		
Erechtites glabrescens			C	D				X		
Exocarpus bidwillii						F				
Fuchsia excorticata			C			F		X		
Gastrodia cunninghamii										Z
Gaultheria antipoda			C	D		F	W	X		
G. crassa	A	B	C	D	E	F	W	X		
G. crassa x antipoda				D						
Gleichenia cunninghamii								X		
Grammitis sp. cf billardieri	A						W	X		
Griselinia littoralis	A	B	C	D	E	F	W	X		
Hebe salicifolia		B	C	D	E	F	W	X		
H. subalpina	A	B	C		E		W			

	A	B	C	D	E	F	W	X	Y	Z
H. traversii			C	D	E	F		X		
Helichrysum glomeratum				D		F		X		
Histiopteris incisa							W	X		
Hoheria glabrata	A	B	C	D	E	F	W	X	Y	
H. lyallii			C	D		F				
Hymenanthera alpina	A	B	C	D	E	F	W	X		
Hymenophyllum malingii							W			
H. multifidum		B	C	D	E		W	X		
H. rarum			C							
H. villosum	A							X		
Hypolepis millefolium	A	B	C	D	E	F	W	X		
Lagenifera pumila					E			X		
Leptospermum ericoides						F		X		
L. scoparium				D		F		X		
Libertia ixioides				D						Z
Libocedrus bidwillii							W	X		
Luzuriaga parviflora			C				W	X		
Lycopodium scariosum							W	X		
L. varium		B	C		E		W	X		

	A	B	C	D	E	F	W	X	Y	Z
L. volubile								X		
Melicytus lanceolatus								X		
Metrosideros umbellata			C	D		F	W	X		Z
Microlaena avenoides								X		
Muehlenbeckia australis			C	D	E			X		
M. complexa			C			F		X		
Myosotis forsteri	A					F	W	X		
Myrsine divaricata	A	B	C	D	E		W	X		
Nertera cf depressa							W	X		
Neomyrtus pedunculata								X		
Nothofagus menziesii										Z
N. solandri var cliffortioides			C	D	E	F		X		
N. solandri x fusca						F		X		
Olearia arborescens	A	B			E			X		
O. avicenniaefolia			C	D	E	F	W	X		
O. colensoi							W			
O. cymbifolia					E					
O. "haastii"		B	C		E					Z

	A	B	C	D	E	F	W	X	Y	Z
O. ilicifolia	A	B		D			W	X		
O. ilicifolia x arborescens										Z
O. moschata	A									
O. nummularifolia	A	B	C	D	E		W	X		
O. virgata			C			F				
Ourisia macrophylla							W	X		
Paesia scaberula								X		
Parsonsia capsularis			C	D		F	W	X		
Phormium cookianum	A	B	C	D	E	F	W	X		
Phymatodes diversifolium	A		C	D				X		Z
Phyllocladus alpinus	A	B	C	D	E	F	W	X		
Pittosporum anomalum	A	B			E				Y	
P. divaricatum					E			X		
P. tenuicaulis			C	D	E			X		
Poa imbecilla			C							
Podocarpus hallii	A	B	C	D	E	F	W	X		
P. spicatus								X		
P. nivalis	A	B	C	D	E	F	W	X		
P. nivalis x hallii	A									
Polystichum richardii						F				
P. vestitum	A	B	C	D	E	F	W	X		

	A	B	C	D	E	F	W	X	Y	Z
Pseudopanax colensoi	A	B	C	D	E		W	X		
P. crassifolium			C	D	E	F		X		
P. lineare							W			
P. simplex	A	B	C				W	X		
P. simplex x colensoi		B								
Pseudowintera colorata								X		Z
Pterostylis cf australis			C					X		
Pyrrosia serpens					E	F		X		Z
Ranunculus hirtus	A		C			F	W	X		
Rubus cissoides			C		E	F	W	X		
R. schmidelioides			C					X		
R. squarrosus			C	D		F	W	X		
Schefflera digitata								X		
Senecio cassinioides		B	C	D	E					
S. eleagnifolius	A	B	C	D	E		W	X		
Sophora microphylla			C	D	E	F		X		
Stellaria parviflora			C					X		
Uncinia uncinata		B	C		E			X		
U. rupestris							W	X		
Urtica incisa			C		E			X		
Viola filicaulis							W	X		
Weinmannia racemosa								X		

In addition, Speight et. al. (1910) recorded the following species, not seen by me, from the upper Rakaia:

Hymenophyllum sanguinolentum

H. revolutum (as *H. tunbridgense*)

Elytranthe flavida

Tupeia antarctica

Clematis australis

Pseudopanax simplex x *anomalus* (as *Nothopanax parvum*)

Cyathodes juniperina (as *Styphelia acerosa*)

Hebe traversii (as *H. leiophylla*)

Olearia moschata, *O. cymbifolia*) perhaps in the Cameron R., where I have collected them.

REFERENCE

Speight, R., Cockayne, L., Laing, R.M. 1910. The Mount Arrowsmith District: A study in physiography and plant ecology. Trans. & Proc. N.Z.Inst. 43, 315-43.

A MISCELLANY OF FLORISTIC RECORDS

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Below are some records of plant distributions noted in the last decade or so. The numbers are grid references.

CANTERBURY

Baumea rubiginosa. Rakaia Valley. Swamp near L. Henrietta S65/985945; swamp near Spectacles S74/065846; formerly at L. Georgina, now extinct S74/061824; tarn beneath Mt Three Peaks S74/070813.

Coprosma cf *intertexta*. Rakaia Valley. Lake Coleridge Downs S74/046777.

Gingidia geniculata. Terrace of Rakaia R.; near Coleridge Downs Homestead S74/037746.