Vegetation of the Waikanae Scenic Reserve

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Introduction

The Waikanae Scenic Reserve covers 5.14 ha, and is located 2 km north of Waikanae directly above S.H. 1. The reserve contains a vigorous remnant of coastal kokekohe-tawa forest. Members of the Wellington Botanical Society visited the reserve in August 1978 and collected data on the structure and composition of its vegetation. Additional data were gathered in January 1980 by M. Wassilieff, C. Wassilieff and H. Beaton.

The reserve lies on a fossil scree fan flanking the Waikanae foothills (Stevens 1974) at an altitude of 60m a.s.l. Some timber was removed from the reserve during early forest clearing in the Waikanae district (Lands and Survey files). The reserve has a history of animal grazing but has been free of stock since 1975.

Methods of Vegetation Analysis

The point intercept method (Druce 1966) was used to obtain information on species' contributions to canopy, understorey and ground cover. Fifty intercept points were made in 1978 and 54 in 1980. The data have been pooled. Diameter at breast height (d.b.h.) measurements were made on the four nearest canopy trees to each of the 50 intercept points made in 1978. A list of the indigenous vascular plant species in the reserve, compiled by A. P. Druce, is appended, with common names of plants named in the text.

Results

Canopy cover values are presented in Table 1. Kohekohe dominates the canopy, contributing over 50 percent of the canopy intercepts. Tawa is the next most important species in the canopy. Mahoe, rewarewa, puka, titoki and *Metrosideros diffusa* were the other species intercepted in the canopy sample.

For all cover values the standard error was calculated (Atkinson 1962).

Understorey intercepts are presented in Table 2. The understorey was separated into an upper understorey, defined as the vegetation intercepts occurring below the canopy but above 2 m, and a lower understorey where the vegetation intercept was between 0.2 m and 2 m. Kohekohe is also dominant in the understorey, although it is more prominent in the upper understorey than in the lower understorey. Other species contribute only a small percentage of the understorey cover, although kawakawa is quite frequent in the lower understorey.

Table 1: Canopy Cover

Species name	Canopy Cover % (± S.E.)
Dysoxylum spectabile	52 ± 5
Beilschmiedia tawa	31 ± 5
Melicytus ramiflorus	6 ± 2
Knightia excelsa	3 ± 2
Griselinea lucida	0.5 ± 0.5
Alectryon excelsus	0.5 ± 0.5
Metrosideros diffusa	0.5 ± 0.5

Table 2: Understorey Intercept Cover

Species name	Cover % (± S.E.)	
	upper	lower
Dysoxylum spectabile	67 ± 4	14 ± 3
Beilschmiedia tawa	0.5 ± 0.5	
Macropiper excelsum	3 ± 2	7 ± 3
Melicytus ramiflorus	5 ± 2	
Coprosma grandifolia		2 ± 2
Ripogonum scandens	1 ± 1	
Parsonsia heterophylla		0.5 ± 0.5
Solanum aviculare	0.5 ± 0.5	
Litter	0.5 ± 0.5	
Gap	21 ± 4	77 ± 4

Table 3: Ground Cover

Species name	Cover % (± S.E.)
Dysoxylum spectabile	2 ± 2
Moss	0.5 ± 0.5
Other species	3 ± 2
Litter	77 ± 4
Stones	9 ± 3
Roots	3 ± 2
Bare ground	6 ± 2

Ground cover values are presented in Table 3. The ground cover was defined as any vegetation intercept occurring below 0.2 m, as measured from the mineral soil level.

Dead leaves and twigs of tawa and kohekohe form a litter layer. Plants are scattered and generally sparsely distributed. Although ferns

Table 4: Size distribution of canopy trees

Species name	Number present in d.b.h. size classes (cm)												
	0 -10	11 -20	21 -30	31 -40	41 -50	51 -60	61 -70	71 -80	81 -90	91 -100	101 -110	111 -120	>120
Dysoxylum spectabile	11	51	19	8	9	8	7	4	5	1	0	0	2
Beilschmiedia tawa	0	4	15	7	8	8	2						
Others	2	11	7	4	2	2							

and a number of tree seedlings are present, only kohekohe seedlings were intercepted more than once. Many rocks lie just below the litter layer or are exposed on the soil surface.

Size class distributions of 200 canopy trees are presented in Table 4. Kohekohe is concentrated in the 11-20 and 21-30 cm d.b.h. classes. There is representation of kohekohe in all size classes up to 100 cm d.b.h. and two hoary specimens were encountered with d.b.h. measurements in excess of 1.2m.

Kohekohe has the greatest stem frequency in the canopy tree classes, followed by tawa, mahoe and rewarea (Table 5). Kohekohe also contributes the greatest proportion to the basal area of the stand.

Interpretation of the forest structure suggests that the forest is largely composed of second-growth trees. The presence of large diameter trees is evidence that complete removal of the forest cover did not occur. Dead *Alsophila* trunks are present throughout the stand. These tree ferns were probably shaded out as the canopy closed through the regrowth of kohekohe and tawa. There is still abundant kohekohe regeneration and all size classes are present, including seedlings, saplings and pole trees. No regeneration of tawa was observed and its future role in this forest is hard to assess.

Species List

The indigenous flora consists of 65 species. Although kohekohe and tawa dominate the canopy, a number of other trees reach the canopy, including titoki, karaka, hinau, pukatea, white maire and black maire. The presence of a large number of species represented by one or only a few individuals illustrates the remnant nature of the reserve (58% of the

Table 5: Contribution to Basal Area

Species name	% stems (N = 200)	Basal area m^2
Dysoxylum spectabile	63	16
Beilschmiedia tawa	23	5.3
Melicytus ramiflorus	6.5	
Knightia excelsa	3	1.7
Others	4.5	

species occur here as only one or a few plants). The large scenic reserve (Hemi Matenga Scenic Reserve) is located a few hundred metres upslope from the Waikanae Scenic Reserve and is probably a very important reservoir of seed to the small remnant reserve. In this context, it is encouraging to note the presence of seedlings and saplings of nikau palm and milk tree, in the absence of adult trees of these species in the reserve.

Adventive weeds are restricted mainly to the periphery of the forested area. Jerusalem cherry *(Solanum pseudocapsicum)* and banana passionfruit *(Passiflora mollissima)* are two problem species present that are capable of surviving and reproducing under the forest canopy. The latter could be a threat to the reserve if it reaches the canopy.

References

Atkinson, I. A. E. 1962. Semi-quantitative measurements of canopy composition as a basis for mapping vegetation. *Proceedings N.Z. Ecol. Soc. 9 :* 1-8

Druce, A. P. 1966. Secondary totara-titoki-matai forest on the Otaki Plain. *Bulletin Wellington Botanical Society 33 :* 22-39.

Stevens, G. 1974. *Rugged Landscape.* A. H. & A. W. Reed, Wellington.

Appendix: *Indigenous vascular plants of Waikanae Scenic Reserve*

A. P. Druce, Botany Division, D.S.I.R.

unc — uncommon
m — margin of forest only

TREES: GYMNOSPERMS

Dacrycarpus (Podocarpus) dacrydioides (unc)
Prumnopitys ferruginea (Podocarpus ferrugineus) (unc)
P. taxifolia (Podocarpus spicatus) (unc)

: MONOCOTYLEDONS

Cordyline australis (unc)
Rhopalostylis sapida (unc) (seedlings only) [nikau]

: DICOTYLEDONS

Alectryon excelsus var. *excelsus* [titoki]
Beilschmiedia tawa [tawa]
Corynocarpus laevigatus (unc) [karaka]
Dysoxylum spectabile [kohekohe]
Elaeocarpus dentatus [hinau]
Griselinia lucida (unc) [puka]
Hedycarya arborea
Knightia excelsa [rewarewa]
Laurelia novae-zelandiae (unc) [pukatea]
Macropiper excelsum var. *excelsum* [kawakawa]
Melicope ternata (unc)
Melicytus ramiflorus ssp. *ramiflorus* [mahoe]
Myoporum laetum var. *laetum*
Myrsine australis (unc)
Nestegis cunninghamii (unc) [black maire]
N. lanceolata (unc) [white maire]
Olearia rani (unc)
Paratrophis banksii (unc) (seedlings only) [milk tree]
Pennantia corymbosa
Pittosporum tenuifolium var. *tenuifolium* (unc) (m)
Pseudopanax arboreus (unc) (m)

SHRUBS: DICOTYLEDONS

Brachyglottis repanda var. *repanda* (unc) (m)
Cassinia leptophylla var. *leptophylla* (m)
Coprosma grandifolia (unc)
C. rhamnoides (unc)
C. robusta (m)
Geniostoma rupestre var. (unc)
Solanum aviculare

LIANES: MONOCOTYLEDONS

Freycinetia baueriana ssp. *banksii* (unc)
Ripogonum scandens (unc)

: DICOTYLEDONS

Clematis paniculata (unc)
Metrosideros diffusa (unc)
M. fulgens (unc)
M perforata (unc)
Muehlenbeckia australis
Parsonsia heterophylla

FERNS

Alsophila tricolor (Cyathea dealbata) (unc)
Arthropteris tenella (unc)
Asplenium bulbiferum ssp. (unc)
A. flabellifolium (unc)
A. flaccidium ssp. *flaccidum* (unc)
A. oblongifolium (A. lucidum) (unc)
A. polyodon (A. falcatum) (unc)
Blechnum filiforme
Lastreopsis glabella (unc)
L. microsora ssp. *pentangularis*
L. velutina
Pellaea rotundifolia (unc)
Phymatosorus diversifolius (Phymatodes diversifolium) (unc)
P. scandens (unc)
Pteridium esculentum (m)
Pteris tremula
Pyrrosia serpens

HERBS: DICOTYLEDONS

Cardamine sp. *(C debilis* agg.) (m)
Oxalis exilis (m)

: MONOCOTYLEDONS

Collospermum hastatum (unc)
Earina mucronata (unc)
Ehrharta (Microlaena) stipoides (m)
Juncus sarophorus (unc) (m)
Uncinia uncinata