INDIGENOUS PLANTS IN A SMALL DOUGLAS FIR PLANTING, MITCHELLS, LAKE BRUNNER

DAVID A. NORTON
Conservation Research Group, School of Forestry, University of Canterbury

There has been growing recent interest in the potential role of plantation forests as habitat for indigenous species (Allen *et al.* 1995, Spellerberg & Sawyer, 1995). While debate over the importance of plantations for conservation of indigenous biodiversity has at times been heated (eg., Rosoman 1994, Sutton 1995), there are still only a limited number of studies documenting indigenous floras in plantations (see Allen *et al.* 1995 for a review). Burrows (1994) recently described the epiphytic flora of two West Coast *Pinus radiata* trees and in this contribution I briefly document the indigenous flora associated with a small West Coast planting of Douglas fir and compare it with an adjacent regenerating shrubland/low forest.

A small stand of Douglas fir (*Pseudotsuga menziesii*; < 1 ha) is located adjacent to the Lake Brunner Lodge at Mitchells, at the southern end of Lake Brunner (NZMS260 K32 785397, 110 m alt., Brunner Ecological District). The Douglas fir were planted in the mid 1950's apparently to provide protection for the lodge from a large landslide that came down in 1953 (Ray Grubb pers. comm.). The early history of the planting is unknown, but the undergrowth was largely cleared in the mid 1980's. Since then a vigorous regrowth of indigenous woody plants has occurred, forming a dense 3-4 m tall layer under the 10 m+ Douglas fir canopy. Dominant species in this regenerating layer include mahoe (*Melicytus ramiflorus*), lemonwood (*Pittosporum eugenioides*) and *Coprosma grandifolia*, but a range of other species is also present with a total of 35 indigenous tree, shrub, vine, herb and fern species recorded (see Table 1). In contrast to the abundance of epiphytes on West Coast *Pinus radiata* (Burrows 1995), only four species were recorded as epiphytes here on Douglas fir, and only one of these, *Pyrrosia eleagnifolia*, was common. Perhaps the bark of Douglas fir is less suitable for epiphyte establishment than is the case with *Pinus radiata*. Apart from the three dominant shrub/small tree species, most species are present as seedlings and many were recorded only once or a few times.

Adjacent to the planting is a small area of regenerating indigenous shrubland/low forest that appears to be of a similar age to the Douglas fir. Here the 5-8 m tall canopy is formed by mahoe, lemonwood, fuchsia (*Fuchsia excorticata*) and tree ferns (both *Dicksonia squarrosa* and *Cyathea smithii*), with a diverse understorey of shrubs and herbaceous plants. The total vascular flora is similar

in size (32 species) and composition to that in the Douglas fir planting (Table 1). However, the abundance of individual species is quite different. There is a much greater number of common species in the regenerating indigenous vegetation. For example, white rata (*Metrosideros diffusa*) and the tree ferns, very uncommon in the Douglas fir area, are abundant in the regenerating forest.

Table 1. Vascular flora of Douglas fir and adjacent regenerating native forest stands

Floristic records: •, species present on ground; R, species present on ground but only seen once (Douglas fir area only); E, epiphyte (Douglas fir area only).

	Douglas fir	**Natural regeneration**
Aristotelia serrata	•	•
Asplenium flaccidum	E	•
Asplenium bulbiferum	•	•
Astelia fragrans	R	•
Blechnum discolor	•	
Blechnum fluviatile	•	
Blechnum sp. "kiokio"	•	•
Carpodetus serratus	•	
Coprosma grandifolia	•	•
Coprosma lucida	•	
Coprosma propinqua	R	
Coprosma rhamnoides	•	•
Coprosma rotundifolia	•	•
Cyathea smithii	R	•
Dacrycarpus dacrydioides	R	•
Dicksonia squarrosa	•	•
Elaeocarpus dentatus	•	
Fuchsia excorticata		•
Griselinia littoralis		•
Hedycarya arborea	•	•
Histiopteris incisa	•	•
Hymenophyllum rarum		•
Hymenophyllum sanguinolentum	ER	
Melicytus lanceolatus		•
Melicytus ramiflorus	•	•
Metrosideros diffusa	R	•
Microlaena avenacea		•
Myrsine australis	•	
Myrsine salicina		•

Parsonsia heterophylla	•	•
Pennantia corymbosa	•	•
Phymatosorus pustulatus	E	•
Pittosporum eugenioides	•	•
Podocarpus hallii		•
Polystichum vestitum	•	•
Prumnopitys ferruginea		•
Prumnopitys taxifolia	•	
Pseudopanax crassifolius	R	
Pteridium esculentum	•	•
Pyrrosia eleagnifolia	E	
Ripogonum scandens	•	•
Schefflera digitata	•	•
Weinmannia racemosa		•
Uncinia uncinata	•	

The future of the indigenous species in the Douglas fir plantation is dependent on future management of the firs. The presence of a vigorous regrowth of indigenous tree and shrub species, together with seedlings of species such as matai (*Prumnopitys taxifolia*) and kahikatea (*Dacrycarpus dacrydioides*) that can dominate tall forest, suggests that if the Douglas fir are removed carefully over a period of several years, then this area will regenerate to indigenous forest. However, removal of all the Douglas fir at once is likely to result in loss of many of the indigenous plants as they are exposed to high radiation and winds. Extraction of individual Douglas fir trees would also need to be undertaken with care to avoid damage to the regenerating indigenous species.

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