

C. trilobus
Dianella nigra
Earina mucronata
Freycinetia banksii
Gahnia lacera
G. xanthocarpa
+*Isolepis reticularis*
+**Juncus effusus*

Lemna minor
Microlaena avenacea
+*Microlaena stipoides*
Oplismenus imbecillis
Phormium tenax
Poa anceps
Pterostylis alobula
Rhopalostylis sapida

Ripogonum scandens
Schoenus tendo
**Tradescantia fluminensis*
Uncinia banksii
+*Uncinia distans*
Uncinia uncinata

Mosses and Liverworts

+*Camptochaete arbuscula*
+*Dicranoloma billardieri*
+*Dicranoloma menziesii*

+ *Hypnodendron* sp.
+*Leucobryum candidum*
+*Monoclea forsteri*

+*Ptychomnion aciculare*

Indigenous Flora of Burbush Road Forest Burbush Road – Te Kowhai Road Intersection

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INTRODUCTION

On the 10 October 1998 we investigated a small (1 ha) kahikatea (*Dacrycarpus dacrydioides*) dominated forest remnant (NZMS 260 S14 044-823, 40 m a.s.l.), located 100 m south of Te Kowhai Road, close to the intersection of Burbush and Te Kowhai Roads, within the Hamilton Basin (*sensu* McCraw 1967).

The forest remnant is of some significance because of the unusual abundance of emergent rewarewa (*Knightia excelsa*), a species which is uncommon in the Hamilton Basin kahikatea forest remnants.

VEGETATION

The vegetation types described below were defined using a simplified version of the scheme of Atkinson (1985). Three types were distinguished.

1. Kahikatea Forest with Tawa and Rewarewa

The dominant vegetation type of the remnant is kahikatea, the canopy dominated by 15-20 m tall specimens; through which occasional tawa (*Beilschmiedia tawa*) and rewarewa (*Knightia excelsa*) protrude. Along the southern margin of the remnant a single pukatea (*Laurelia novae-zelandiae*) is also emergent.

The understorey of this vegetation type is poorly developed, comprising scattered patches of white maire (*Nestegis lanceolata*), mapou (*Myrsine australis*), milktree (*Streblus heterophyllus*), mahoe (*Meliccytus ramiflorus* subsp. *ramiflorus*), titoki (*Alectryon excelsus* var. *excelsus*), privet (*Ligustrum sinense*), and one matai (*Prumnopitys taxifolia*). The vines *Parsonsia heterophylla*, pohue (*Muehlenbeckia australis*) are prominent along the exposed margins of this vegetation, while in those less exposed sites occasional kiekie (*Freycinetia banksii*), and supplejack (*Ripogonum scandens*) are present.

The shrub layer of this vegetation type is mainly dominated by hangehange (*Geniostoma ligustrifolium*), mahoe, mapou, privet, ponga (*Cyathea dealbata*) and wheki (*Dicksonia squarrosa*), while the ground cover is largely covered in metre deep tangles of wandering jew (*Tradescantia fluminensis*). Toward the forest margins, and nearer the western end, wandering jew is less dominant, and in these sites tussocks of *Gahnia xanthocarpa*, patches of bastard grass (*Uncinia uncinata*), and the ferns *Asplenium oblongifolium*, and *A. polyodon* are common.

2. Tawa/Titoki Forest with Rewarewa

At the eastern end of the remnant tawa dominates the forest canopy, declining in dominance as one moves west toward the forest centre, wherein it is replaced by titoki. Associated with these trees are a few emergent rewarewa. Titoki, mahoe and mapou dominate the understorey of this vegetation. Otherwise this vegetation type has a similar shrub and ground layer composition, with one notable exception, the inner forest floor of the eastern portion has developed a subcanopy of wheki and ponga tree ferns the ground cover of which is dominated by ivy (*Hedera helix* subsp. *helix*).

3. Wheki Tree Fernland

In one place, along the northwestern margin of the forest a small area of wheki tree fern land is present. Whether this arose naturally, or through the attrition of the surrounding kahikatea canopy is unclear. The shrub and groundcover tiers in this area are dominated by wandering jew, which has all but smothered any indigenous associates.

THE FLORA

A vascular flora of 67 taxa was recorded during our one and a half-hour visit to the remnant (Appendix 1). Of those species recorded, 42 are indigenous, 23 naturalised, and 2 - London plane (*Platanus occidentalis*) and grapefruit (*Citrus paradisi*) - are probably planted.

Naturalised Plants

Three naturalised plants are prominent in the forest, wandering jew, privet and ivy. Some effort to control the privet has been attempted by the landowner, who has sprayed the dense privet margin of the forest with Escort (Landowner pers. comm. 1998). This action although successfully killing most of the marginal privet is largely cosmetic, for privet is still locally common throughout the inner forest.

No attempt has been made to control the wandering jew and ivy, both of which dominate the forest floor within their respective distributions (as described above), and now seriously threaten to smother any associated indigenous plants.

Aside from these species, occasional sapling specimens of Japanese spindleberry (*Euonymus japonicus*) and barberry (*Berberis glaucophylla*) are present throughout the remnant. Both species are a potential threat to the forest if their spread is left uncontrolled. On the northern margin of the forest three tussocks of pampas grass (*Cortaderia selloana*) are present, and should be removed to prevent their further spread. Several patches of montbretia (*Crocasmia x crocosmiiflora*) are also present along the southern western forest margins. If left uncontrolled, this aggressive plant is likely to spread further into the forest.

On the northeastern margin of the forest we encountered several tangles of lady's fingers (*Tropaeolum pentaphyllum*) (P.J. de Lange 3588 & P.D. Champion, AK, CHR, WAIK), an attractive, though aggressive vine, with tubular reddish-pink flowers. Although recorded as naturalised around Hamilton (Webb et al. 1988), this is the first time either of us have seen this species truly wild in the area. Another unusual plant of the forest remnant is butcher's broom (*Ruscus aculeatus*) (P.J. de Lange 3591 & P.D. Champion, AK), which is present as a single patch amongst the ivy covering the ground of the eastern portion of the remnant. This species, a distant relative of the field asparagus (*Asparagus officinalis*) is not recorded as naturalised by Healy & Edgar (1980). Since that publication (aside from our Burbush Forest collection), butcher's broom has been collected three times; twice in the South Island (Makerikeri River, near Loburn, J.R. Clapham, 1986, CHR 385675; Riccarton Bush, A.J. Healy 87/65, 1987, CHR 322040), and once from the North Island (banks of Whanganui River, near Aramoho, C.C. Ogle, 1997, CHR 514126). Butcher's broom is a distinctive plant, forming a low shrub with dark-green flattened, leaf-like cladodes, which possess a distinct, hardened mucro. The abaxial surface of each cladode bears a single pale green flower, which in time produces a globose, fleshy red berry. Like *Asparagus* spp. butcher's broom is probably spread by birds, though some collections suggest the plant may be a persistent garden discard.

Indigenous Plants

The indigenous taxa of Burbush Forest are fairly representative of the range of taxa already recorded from similar sized remnants elsewhere in Hamilton Basin (Champion 1988; de Lange 1986, 1987A, 1987B, 1989A, 1989B, 1996). What makes the remnant significant is the unusual abundance of rewarewa. Although current botanical information of the composition of those forest remnants in the northern western quarter of the Hamilton Basin is incomplete, based on our collective experience of other Hamilton Basin forest remnants, rewarewa is apparently scarce in kahikatea dominated forest. What is perhaps more intriguing, is that rewarewa is typically a tree favouring dry, infertile soils. Although this pattern holds true in the hills bordering the Hamilton Basin, on the basin floor, rewarewa when in association with kahikatea, seems to prefer those more poorly drained and peaty forest remnants.

Other notable indigenous plants discovered within the remnant include kiekie, supplejack and *Gahnia xanthocarpa*. All three are now rather scarce in Hamilton Basin kahikatea remnants, persisting mainly in those swampy forested remnants bordering the Waikato River, e.g., Hammond Bush (de Lange 1996) or in the much wetter, and less accessible gully systems (de Lange 1986; 1987A).

DISCUSSION

Burbush Forest has been ring-fenced for at least 83 years (Landowner pers. comm., 1998). The fence although deteriorating, still prevents stock access. We have been told that since the current owner took over the land no trees have been removed from the remnant. Nevertheless, the absence of any large "stags head" kahikatea, the presence of only one pole sized matai, and the occasional rotted, sawn log and tree stump, suggest that the forest was selectively logged at some stage in its history.

Although Burbush Forest has been drained, the dried out peaty forest soils and exhumed kahikatea root systems (in places exposed "high and dry" 1 m above the current forest floor) are suggestive that the forest was formerly very swampy. Further evidence of this former condition is also seen by the persistence of *Gahnia xanthocarpa* and the carices, *C. lessoniana* (1 plant) and *C. virgata*, all species favouring waterlogged conditions.

With the reduction in the forest water table, there has been a gradual shift in the forest composition toward those species favouring drier conditions, e.g., titoki, and tawa. The process is still continuing, although wandering jew and ivy smothering the forest floor are retarding it. The forest is also notable for the complete absence of divaricating *Coprosma* species, which are usually a feature of the understories of Hamilton Basin kahikatea forest. In fact the only divaricating species present is milktree, of which we saw many adult specimens but only the occasional juvenile, and no seedlings. The absence of divaricating species may be due to the dry forest floor, but it is also likely that the dense 1 m deep tangles of wandering jew have long since smothered many of the smaller divaricating shrubs species.

In common with many other Hamilton Basin remnants we saw few indigenous birds. One kereru (*Hemiphaga novaeseelandiae*) was observed in the top of a tawa tree, and the Landowner (pers. comm., 1998) has reported morepork (*Ninox novaeseelandiae*) as occurring in the remnant. The presence of kereru is interesting but it is very unlikely that this species would nest in the forest, which is too small to support the species. It is more likely that when in season, occasional kereru visit the forest from the nearby ranges to feed on tawa and kahikatea fruit. Similarly there have been unconfirmed reports of tui (*Prosthemadera novaeseelandiae*) visiting the forest. Although we did not see any on our visit, tui, which are scarce in the Hamilton Basin may visit Burbush Forest when the rewarewa trees are in flower (G.M. Crowcroft pers. comm.). Certainly the abundance of this tree in the remnant, when in season, would probably represent a significant nectar resource for any tui crossing the Hamilton Basin.

Acknowledgements

We thank Rhys Gardner and Gillian Crowcroft for their comments on a draft version of this article, and Colin Ogle and Kerry Ford for information on *Ruscus aculeatus* occurrences. We are also grateful to the Landowner of Burbush Forest (who chose to remain anonymous), for granting access and permission to collect herbarium specimens.

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