

Vegetation and floristics of Burnt Down Scrub Nature Reserve, North Coast, New South Wales

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The vegetation of Burnt Down Scrub Nature Reserve, 15 km south west of Baryugil in the Parish of Carnham on the North Coast of New South Wales is described. A floristic survey of 28 × 0.04 ha plots was conducted in December of 1999. Five communities are defined based on flexible UPGMA analysis of abundance scores of vascular plant taxa. These communities are mapped based on ground truthing, air photo interpretation and substrate.

A total of 355 vascular plant taxa was recorded including four species listed as rare or threatened: *Marsdenia liisae*, *Olearia heterocarpa*, *Sarcophilus weinthalii* and *Tinospora smilacina*. This paper describes the communities and discusses their significance and distribution within the Nature Reserve. A vegetation map and species list are provided.

Introduction

Burnt Down Scrub Nature Reserve is located 8 km north-north-west of the junction of the Mann and Clarence Rivers and 15 km south west of Baryugil (Fig. 1). The Nature Reserve is within the North Coast Botanical Subdivision and the New South Wales North Coast (NNC) Bioregion. The reserve includes 338 ha incorporating Portions 94 and 99 of the Parish of Carnham and the County of Drake. Freehold land currently used for grazing purposes surrounds the Nature Reserve. Burnt Down Scrub NR was dedicated under the *Forestry and National Park Estate Bill 1998* and was gazetted on 1 January 1999.

This paper gives part of the results of a flora survey conducted for the Northern Tablelands Region of the NSW National Parks and Wildlife Service (NSW NP&WS). The aims of this study were to provide a vegetation map of communities to assist in fire management of the Nature Reserve and to provide information on the distribution of rare, geographically restricted or disjunct taxa within the conservation area. This information will be used to develop appropriate management strategies (Hunter 2000).

Geology and geomorphology

Burnt Down Scrub Nature Reserve is in undulating to rugged terrain associated with the upper reaches of the Clarence River catchment. Aspects are predominantly southern and western. Burnt Down Creek is a lesser tributary of the Mann River, and

drains the reserve towards the south. The sedimentary basement rock has been deeply eroded and the reserve falls from 520 m to 200 m altitude over its length.

The basement rock types of the area are of argillites, phyllites, slates, limestone and intermediate volcanics which are of Ordovician to Silurian age (Floyd 1981). Just to the south west of the corner of the reserve is an outcrop of dioritic and gabbroic intrusives of Permian age.

History and landuse

The area of Portions 94 and 99 show some significant evidence of past clearing in patches and associated grazing. Some selective logging is evident in the closed forest patches along with greater selective logging in the open forest areas. When these operations occurred and for how long are not known. Following inspection in 1976 the area was gazetted as State Forest. Floyd (1981) recommended that Portion 99 be handed over to the management of the NSW NP&WS. However, it was considered that Portion 99 could be adequately managed within State Forests as a Flora Reserve. Burnt Down Scrub remained part of the Washpool State Forest after the Environmental Impact Statement of the Casino District (State Forests of NSW 1995) with the recognised Dry Rainforest assemblages reserved indefinitely from logging as a State Forest Reserve. The western boundary areas and most of Portion 94 were gazetted for logging in 2000–2002. Much of the western boundary of the reserve was, until gazettal, held under an occupational grazing permit.

Fires have been used as a management tool by the holders of grazing permits and by State Forests themselves, for both reduced fuel loads and green pick for cattle. A major fire swept through much of the reserve in 1985 (State Forests of NSW 1995). Previous information on fires is not currently available, however evidence during this field investigation indicated that some major fires have occurred over much of the reserve.

Previous investigations

Although few site-based data were available for Burnt Down Scrub, sufficient ground-based work had been conducted. The area covered by the reserve was originally checked by the Forestry staff Pople, Graham and Owens in 1976 and Owens later produced a sketch map of the vegetation. Alex Floyd visited the area in March 1981 to evaluate the rainforest contained in portion 99 (Floyd 1981). Floyd spent two days investigating the area and described two closed forest communities: a viney scrub on previously cleared areas that had been overgrown with *Lantana* and a myrtle scrub. Floyd considered the latter to be a remnant of a much larger rainforest (Floyd 1981). Floyd considered the Dry Rainforest was of considerable interest as it was a southern outlier of similar forests from the Richmond Valley, linking that region with similar associations in the Macleay, Guy Fawkes and Kangaroo Rivers regions. In 1994 Doug Binns placed three sites within what is now Burnt Down Scrub Nature Reserve in order to assess the vegetation for the EIS of the Casino District forestry operations (Binns 1995).

Methods

This survey was conducted over three days in December 1999. Twenty eight, 20 × 20 m quadrats were surveyed for vascular plants scored using the Braun-Blanquet (1982) cover abundance scale. Quadrats were placed using a stratified random method using past vegetation mapping to delineate strata in which random quadrats were placed.

Good quality plant material was retained as vouchers by the Northern Tablelands Region of the NSW NP&WS and duplicates of significant collections submitted to the Herbarium of the North Coast Botanic Gardens (COFFS). Nomenclature follows that of Harden (1990–1993) except where recent changes have been made.

Analyses and data exploration were performed using options available in the PATN Analysis Package (Belbin 1995a, b). For final presentation of results all species and their relative abundance scores were used and the analysis performed using Kulczynski association measure which is recommended for ecological applications (Belbin 1995a, b) along with flexible UPGMA and the default PATN settings.

Delineation of community boundaries in Fig. 2 was based on the location of sites and their position within the multivariate analysis, air photograph interpretation and ground truthing. The vegetation map is based on a 1: 25 000 scale. Structural names follow Specht et al. (1995) and are based on the most consistent uppermost stratum.

Results and Discussion

Five communities were recognised at the dissimilarity measure of c. 0.9. A summary of the community relationships is given by the dendrogram (Fig. 3). The first major division on the dendrogram separates open forests from closed or mixed forests. The next major division separates closed forests from mixed forests. In all 355 vascular plant taxa from 106 families and 252 genera, were recorded from the collation of existing site data and subsequent sampling (Appendix). Approximately 3.5% (12) of all taxa were exotic. Four species are listed as rare or threatened within Briggs and Leigh (1996) or on the *Threatened Species Conservation Act 1995* and include: *Marsdenia liisae* (3RC–), *Olearia heterocarpa* (2RCa), *Sarcophilus weinthalii* (3VC– & Schedule 2, *Vulnerable TSC Act 1995*) and *Tinospora smilacina* (Schedule 1, *Endangered TSC Act 1995*). All communities are described based on their native flora components.

Vegetation communities

Two broad types of natural community structure were found. Tall open forests were located in the northern half of the reserve and these are dominated by a variety of eucalypt species with a grassy understorey and in some cases a prominent mesic shrub layer. In the rest of the reserve low closed forests are found with eucalypt emergents. In some situations where past clearing has occurred closed forest gives way to dense *Lantana* infestations. A summary of relevant statistics for each community is presented in Table 1. In the following descriptions of communities, extreme values are given in brackets. See Appendix for a species list for the flora of Burnt Down Scrub Nature Reserve.

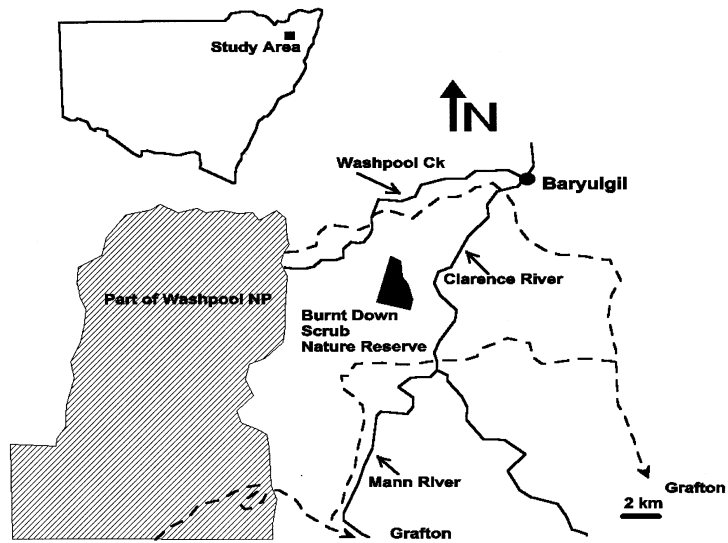


Fig.1. Map of locality of the Burnt Down Scrub Nature Reserve.

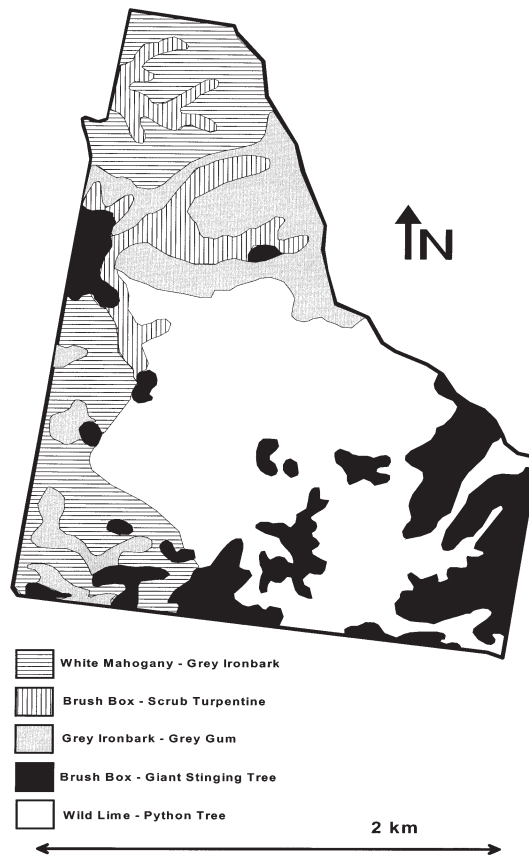


Fig. 2. Map of vegetation communities for Burnt Down Scrub Nature Reserve.

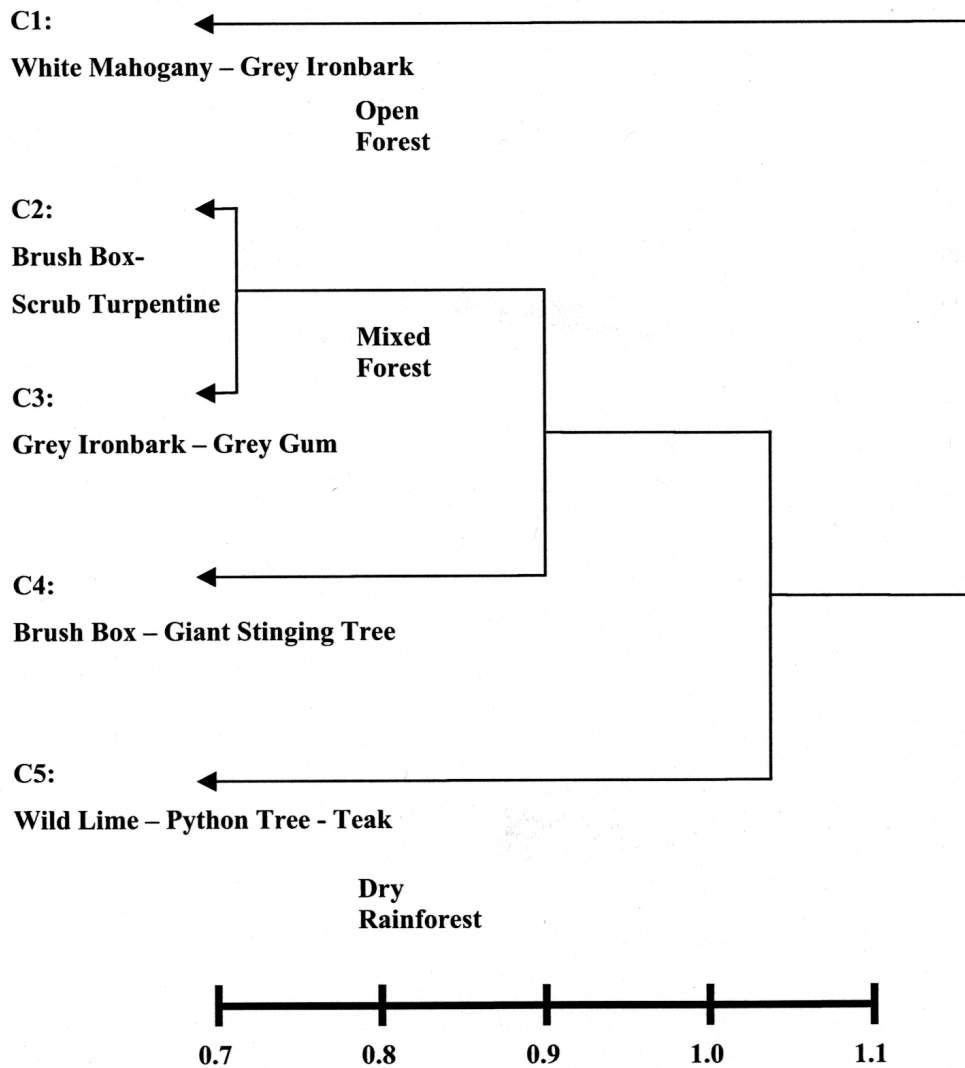


Fig. 3. Summary dendrogram of the full floristic dataset of sites using the Kulczynski association and flexible UPGMA fusion strategy and a β value of -0.1. Communities have been defined at a dissimilarity level of c. 0.9.

Table 1: Selected attributes of the seven defined communities at Burnt Down Scrub Nature Reserve.

Community	Number of Sites	Richness per 400 m ² (average)	Number of Species	Number of Introduced Species	Proportion of Reserve	Number of Hectares
C1: White Mahogany – Grey Ironbark	10	16–42 (32)	110	7	19%	72
C2: Brush Box – Scrub Turpentine	5	29–50 (41)	105	2	7%	28
C3: Grey Ironbark – Grey Gum	4	39–48 (42)	92	6	12%	45
C4: Brush Box – Stinging Tree	3	18–35 (28)	59	1	17	66
C5: Wild Lime – Python Tree – Teak	6	13–41 (25)	75	1	45	175

Community 1: White Mahogany – Grey Ironbark Tall Open Forest

White Mahogany (*Eucalyptus acmenoides*) – Grey Ironbark (*Eucalyptus siderophloia*) – Small-fruited Grey Gum (*Eucalyptus propinqua*)

Distribution: Mainly in the northern and south-western sections of the reserve on moist loamy, deep and dark brown soils.

Structure: Upper (20–) 25–30 m tall; (20–) 25–30% cover. Upper middle layer, to 15 m tall, usually not present; to 25 % cover. Lower middle layer 3–5 (–8) m tall; 10–30 (–40)% cover. Ground layer to 1 m tall; 90% cover.

Trees: *Eucalyptus acmenoides*, *Eucalyptus siderophloia*, *Eucalyptus propinqua*, *Eucalyptus microcorys*, *Allocasuarina torulosa*, *Eucalyptus moluccana*, *Corymbia gummifera*, *Corymbia citriodora* subsp. *variegata*, *Eucalyptus saligna*, *Lophostemon confertus*, *Eucalyptus umbra*.

Shrubs: *Acacia irrorata*, *Desmodium brachypodum*, *Breynia cernua*, *Macrozamia fawcettii*, *Swainsona brachycarpa*, *Solanum densevestitum*, *Lespedeza juncea*, *Xanthorrhoea glauca*, *Rapanea variabilis*, *Jacksonia scoparia*, *Solanum stelligerum*, *Polyscias sambucifolia*, *Indigofera australis*, *Pimelea neo-anglica*, *Alpinia caerulea*, *Acacia longifolia*, *Acacia falciformis*.

Climbers & trailers: *Hibbertia scandens*, *Hardenbergia violacea*, *Desmodium varians*, *Glycine clandestina*, *Rubus parvifolius*, *Rubus rosifolius*, *Eustrephus latifolius*, *Clematis glycinoides*, *Glycine tabacina*, *Austrosteenisia blackii*.

Ground flora: *Sorghum leiocladum*, *Imperata cylindrica*, *Poa sieberiana*, *Vernonia cinerea*, *Pteridium esculentum*, *Dianella caerulea* var. *assera*, *Viola betonicifolia*, *Lepidosperma laterale*, *Hydrocotyle peduncularis*, *Lomandra longifolia*, *Dichondra repens*, *Themeda triandra*, *Senecio lautus* subsp. *lanceolatus*, *Proiphys cunninghamii*, *Plectranthus parviflorus*, *Oplismenus imbecillis*, *Lomandra multiflora*, *Geranium solanderi* subsp. *solanderi*, *Calochlaena dubia*, *Viola hederacea*, *Veronica calycina*, *Ranunculus lappaceus*, *Dianella caerulea* var. *caerulea*, *Cyperus enervis*, *Chrysocephalum apiculatum*, *Ajuga australis*.

Variability: Two distinct sub-assemblages are apparent based on overstorey species, but which are similar in their understorey components. Across the north-eastern boundary the community is dominated by *Eucalyptus acmenoides* with *Eucalyptus siderophloia*, *Eucalyptus propinqua* and a minor component of *Eucalyptus moluccana* this grades to a more *Eucalyptus siderophloia* dominated patch with the addition of *Corymbia gummifera* on the north-western boundary. The second sub-assemblage occurs in the south-west of the reserve; here *Corymbia citriodora* subsp. *variegata* is prominent.

Conservation and management issues: Considered well reserved across its range. The adventive *Lantana* is only a minor component of this community at present. It is possible that this assemblage will undergo some floristic and structural change and that current boundaries may not be stable under different fire regimes.

Community 2: Brush Box – Scrub Turpentine Tall Open Forest

Brush Box (*Lophostemon confertus*) – Scrub Turpentine (*Rhodamnia rubescens*) – Tallowwood (*Eucalyptus microcorys*)

Distribution: Along gullies primarily in the northern section of the reserve. Soils are primarily damp, loamy, deep and dark brown to brown.

Structure: Upper layer 25–30 m tall; 30–40% cover. Upper middle layer often not present 5–15 m tall; about 40% cover. Lower middle layer often not present 2–6 m tall; cover 20%. Ground layer to 1 m tall; ground cover variable 30–90%.

Trees: *Lophostemon confertus*, *Rhodamnia rubescens*, *Eucalyptus microcorys*, *Guioa semiglaucula*, *Quintinia sieberi*, *Eucalyptus acmenoides*, *Eucalyptus saligna*, *Eucalyptus siderophloia*, *Dendrochne excelsa*, *Synoum glandulosum*, *Rapanea variabilis*, *Ficus coronata*, *Euroschinus falcata*, *Endiandra virens*.

Shrubs: *Alpinia caerulea*, *Cordyline petiolaris*, *Citriobatus pauciflorus*, *Neolitsea dealbata*, *Pimelea strigosa*, *Solanum densevestitum*, *Maytenus bilocularis*, *Hibiscus heterophyllus*, *Acacia longifolia*, *Swainsona brachycarpa*, *Solanum stelligerum*, *Senecio amygdalifolius*, *Livistona australis*, *Psychotria loniceroides*, *Melicope erythrocarpa*, *Breynia cernua*, *Alchornea ilicifolia*, *Acacia irrorata*.

Climbers & trailers: *Rubus rosifolius*, *Cissus antarctica*, *Smilax australis*, *Pandorea pandorana*, *Desmodium varians*, *Cayratia clematidea*, *Austrosteenisia blackii*, *Marsdenia liisae*, *Hibbertia scandens*, *Glycine clandestina*, *Eustrephus latifolius*.

Ground flora: *Poa sieberiana*, *Imperata cylindrica*, *Blechnum cartilagineum*, *Oplismenus imbecillis*, *Dianella caerulea* var. *assera*, *Viola hederacea*, *Lomandra longifolia*, *Gahnia sieberiana*, *Cyperus tetraphyllus*, *Calochlaena dubia*, *Adiantum aethiopicum*, *Typhonium brownii*, *Senecio lautus* subsp. *lanceolatus*, *Geranium solanderi* subsp. *solanderi*, *Doodia aspera*, *Senecio* sp. E, *Proiphys cunninghamii*, *Oxalis perennans*, *Lepidosperma laterale*, *Galium migrans*, *Gahnia melanocarpa*.

Variability: Two sub-assemblages may be delineated. Areas upstream with potentially greater incursion of fires have a less well developed mesic understorey and are dominated by trees found in the adjacent Community 1, namely *Eucalyptus acmenoides* and *Eucalyptus microcorys*. Down stream the community has a dense mesic understorey and is dominated by *Lophostemon confertus* and *Eucalyptus saligna*.

Conservation and management issues: An extremely widespread association that is found in the majority of reserves along the escarpment of the North Coast. This community is well reserved both locally and regionally. Development depends on time since last fire and depth of incursion. This community occurs in narrow bands with a large edge to area ratio. If fires occur less frequently this community is likely to expand and develop structurally.

Community 3: Grey Ironbark – Grey Gum Tall Open Forest

Grey Ironbark (*Eucalyptus siderophloia*) – Small-fruited Grey Gum (*Eucalyptus propinqua*) – Brush Box (*Lophostemon confertus*)

Distribution: On steeper slopes in comparably exposed positions. The soils are moist to damp, loamy, dark brown to brown and deep.

Structure: Upper layer (14–) 25–30 m tall; cover 30–35%. Upper mid layer usually present 8–15 m tall; 40% cover. Lower mid layer often not present 2–8 m tall; cover 10–30%. Ground layer, 1–3 m tall; cover variable (30–) 70–90%.

Trees: *Eucalyptus siderophloia*, *Eucalyptus propinqua*, *Lophostemon confertus*, *Eucalyptus acmenoides*, *Corymbia citriodora* subsp. *variegata*, *Eucalyptus microcorys*, *Quintinia sieberi*, *Eucalyptus moluccana*, *Eucalyptus fibrosa*, *Zanthoxylum brachyacanthum*, *Rhodamnia rubescens*.

Shrubs: *Swainsona brachycarpa*, *Callistemon salignus*, *Solanum densevestitum*, *Pimelea neo-anglica*, *Hibiscus heterophyllus*, *Solanum campanulatum*, *Polyscias sambucifolia*, *Xanthorrhoea glauca*, *Psychotria loniceroides*, *Pimelea strigosa*, *Neolitsea australiensis*, *Solanum stelligerum*, *Senna clavigera*, *Olearia heterocarpa*, *Nyssanthes diffusa*, *Cordyline petiolaris*.

Climbers & trailers: *Desmodium varians*, *Eustrephus latifolius*, *Pandorea pandorana*, *Marsdenia lloydii*, *Glycine clandestina*, *Cissus antarctica*, *Smilax australis*.

Ground flora: *Poa sieberiana*, *Sorghum leiocladum*, *Oplismenus imbecillis*, *Lepidosperma laterale*, *Senecio lautus* subsp. *lanceolatus*, *Dichondra repens*, *Cyperus enervis*, *Lomandra longifolia*, *Hydrocotyle peduncularis*, *Dianella caerulea* var. *assera*, *Calochlaena dubia*, *Veronica calycina*, *Proiphys cunninghamii*, *Plectranthus parviflorus*, *Oxalis perennans*, *Imperata cylindrica*, *Senecio* sp. E, *Rhytidosporum procumbens*, *Dianella caerulea* var. *caerulea*, *Cyperus tetraphyllus*, *Alocasia brisbanensis*.

Variability: Probably somewhat intermediate between Community 1 and 2. It occurs along the margin of well developed closed forest. While the overstorey was relatively consistent the understorey was highly variable.

Conservation and management issues: Well reserved locally and across its range range. Likely to change over short time periods due to changes in management or incursions of fire. *Lantana* is a serious problem in some localities and is likely to expand into other parts.

Community 4: Brush Box – Stinging Tree Closed Forest

Brush Box (*Lophostemon confertus*) – Giant Stinging Tree (*Dendrocnide excelsa*) – Ivorywood (*Siphonodon australe*)

Distribution: Occurring patchily throughout the reserve where *Lantana* is at its densest.

Structure: Upper layer 20–40; cover 10–20%. Understorey 5–10 m tall; 90–100% cover.

Trees: *Lophostemon confertus*, *Dendrochne excelsa*, *Siphonodon australis*, *Synoum glandulosum*, *Flindersia xanthoxyla*, *Eucalyptus saligna*, *Cryptocarya obovata*, *Baloghia inophylla*, *Wilkiea huegeliana*, *Rapanea variabilis*, *Livistona australis*, *Grevillea robusta*, *Geijera salicifolia*, *Endiandra virens*, *Denhamia celastroides*, *Bridelia exaltata*, *Austromyrtus bidwillii*.

Shrubs: *Neolitsea dealbata*, *Alpinia caerulea*, *Nyssanthes diffusa*, *Melicope micrococca*, *Citriobatus pauciflorus*.

Climbers & trailers: *Austrosteenisia blackii*, *Cissus antarctica*.

Ground flora: *Polystichum formosum*, *Proiphys cunninghamii*, *Pollia crispata*, *Cyperus tetraphyllus*, *Cyperus enervis*, *Lastreopsis munita*, *Calochlaena dubia*, *Arthropteris tenella*, *Alocasia brisbanensis*.

Variability: This is a derived community and variability is largely based on the density of *Lantana* stands.

Conservation and management issues: This is a derived community largely based on the dominance of *Lantana camara*. *Lantana* is particularly prevalent where past clearing activities have occurred and where there has been a mixture of grazing and burning. Despite the density of *Lantana*, a number of significant species were found within this assemblage.

Community 5: Wild Lime – Python Tree – Teak Closed Scrub

Wild Lime (*Capparis arborea*) – Python Tree (*Austromyrtus bidwillii*) – Teak (*Flindersia australis*)

Distribution: Mainly restricted to the southern portion of the reserve. Soils are damp to moist, dark brown, brown to red brown and shallow to deep.

Structure: Upper layer 20–30 (–35) m tall; cover 20–30 (–50%). Mid layer 5–15 m tall; cover 80–90%. Ground layer 1–2 m tall; cover usually c. 10%.

Trees: *Capparis arborea*, *Austromyrtus bidwillii*, *Flindersia australis*, *Siphonodon australis*, *Diospyros australis*, *Rapanea variabilis*, *Eucalyptus fibrosa*, *Alectryon subcinereus*, *Alchornea ilicifolia*, *Scolopia braunii*, *Grevillea robusta*, *Flindersia xanthoxyla*, *Ficus watkinsiana*, *Backhousia sciadophora*, *Atalaya salicifolia*, *Aphananthe philippinensis*, *Zanthoxylum brachyacanthum*, *Gmelina leichardtii*, *Drypetes australasica*, *Cryptocarya obovata*, *Bridelia exaltata*.

Shrubs: *Psychotria loniceroides*, *Canthium vaciniifolium*, *Cordyline petiolaris*, *Psychotria daphnoides*, *Alyxia ruscifolia*, *Olearia nernstii*, *Neolitsea dealbata*, *Maytenus bilocularis*.

Climbers & trailers: *Cissus antarctica*, *Morinda jasminoides*, *Austrosteenisia blackii*, *Marsdenia lloydii*, *Smilax australis*, *Pandorea pandorana*, *Marsdenia liisae*.

Ground flora and epiphytes: *Pellaea nana*, *Pyrrosia confluens*, *Platynerium bifurcatum*, *Dendrobium schoeninum*, *Sarcophilus weinhlüi*, *Rhinerrhiza divitiflora*, *Dendrobium tarberi*, *Dendrobium speciosum*, *Dendrobium monophyllum*, *Dendrobium fairfaxii*, *Dendrobium bowmanii*, *Oplismenus imbecillis*, *Dendrobium teretifolium*, *Dendrobium gracilicaule*, *Cyperus enervis*.

Variability: Largely based on past fire encroachment and past selective logging. Along the access trail where some tree removal has occurred the community has a dense cover of regrowth and the height of the closed forest under-canopy is low. Along some ridges deep within this community the overstorey is dominated by Ironbarks with a dense and medially tall closed forest under-canopy dominated by *Backhousia sciadophora* and *Austromyrtus bidwillii*. In a few protected sites the assemblage is overtopped by *Flindersia australis* rather than eucalypt species.

Conservation and management issues: This assemblage is adequately reserved across its range, particularly in the north but less so in the south. Burnt Down Scrub Nature Reserve represents the only occurrence of this community type in the local area and as such this community is naturally well reserved locally.

Discussion

Burnt Down Scrub Nature Reserve contains at least 355 vascular plant taxa. On a site basis the number of species is rather low compared to nearby tablelands regions (Hunter 1998, Hunter et al. 1999). However, surveys conducted in the nearby Gibraltar Range and nearby low land coastal areas indicated that site richness is generally lower in these types of communities (Sheringham & Hunter 2002, Binns 1995). Thus, site richness and overall richness are probably indicative of this part of the region.

Floyd (1981) was astute when he considered after two days of ground investigations that the reserve was a southern outlier of communities from the Richmond River basin. Based on the extensive summaries of community relationships published by the Resource and Conservation Assessment Council (1996) and the Comprehensive Resource Assessment (1999) this relationship is upheld. In the broadest sense the communities contained within Burnt Down Scrub have correlates along the eastern escarpment at altitudes between about 300 and 700 m from Gloucester to just over the Queensland border in the north in the Moreton District. Burnt Down does provide a link, as suggested by Floyd (1981), between the Richmond River area and the gorge country of Guy Fawkes and the Macleay. More specifically though the communities of Burnt Down are probably largely restricted to the lowland areas of the upper Clarence and Richmond Rivers. In terms of individual floristics the most recurring feature is the number of taxa known to be at or near the southern distribution within the reserve. This is particularly so for Community 5, which contains a number of taxa not recorded further south.

Conclusion

Burnt Down Scrub Nature Reserve is a significant link between the Richmond River area and those of the gorge country associated with the Guy Fawkes and Macleay Rivers. The communities within the reserve are largely restricted to the lowland areas of the upper Clarence and Richmond basins and many species are at or near their southern limit of distribution. Though all communities are considered to be adequately reserved many are highly significant occurrences. In particular, Community 5 is the only local occurrence of this community type. Despite its small size Burnt Down Scrub has a significant number of species.

Acknowledgments

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Appendix: Flora of Burnt Down Scrub Nature Reserve. Nomenclature follows that of Harden (1990–1993) except where recent changes have occurred. Taxa found within the survey sites are scored according to their occurrence in each of the 5 communities defined. Some taxa were found in previous surveys or opportunistically and therefore are not assigned to a specific community. C1 = White Mahogany – Grey Ironbark; C2 = Brush Box – Scrub Turpentine; C3 = Grey Ironbark – Grey Gum; C4 = Brush Box – Giant Stinging Tree; C5 = Wild Lime – Python Tree – Teak. Introduced species are indicated by '*'. Species at their southern limit are indicated by (S).

Taxon	C1	C2	C3	C4	C5	Opportunistic
Acanthaceae						
<i>Brunoniella australis</i>			C3			
<i>Pseuderanthemum variabile</i>						0
Adiantaceae						
<i>Adiantum aethiopicum</i>	C1	C2	C3			
<i>Adiantum formosum</i>			C3			
<i>Adiantum hispidulum</i>			C3			
<i>Pellaea nana</i>				C4	C5	
Agavaceae						
<i>Cordyline petiolaris</i>						0
<i>Cordyline stricta</i>						0
Alangiaceae						
<i>Alangium villosum</i> subsp. <i>polyosmoides</i>						0
Amaranthaceae						
<i>Deeringia arborescens</i>						0
<i>Nyssanthes diffusa</i>			C3	C4	C5	
Amaryllidaceae						
<i>Proiphys cunninghamii</i>	C1	C2	C3	C4	C5	
Anacardiaceae						
<i>Euroschinus falcata</i> var. <i>falcata</i>		C2			C5	
Annonaceae						
<i>Rauwenhoffia leichardtii</i>						0
Anthericaceae						
<i>Arthropodium milleflorum</i>						0
<i>Laxmannia gracilis</i>						0
<i>Thysanotus tuberosus</i>						0
<i>Tricoryne elatior</i>						0
Apiaceae						
<i>Hydrocotyle peduncularis</i>	C1		C3			
<i>Daucus glochidiatus</i>						0
<i>Platysace ericoides</i>						0
Apocynaceae						
<i>Alstonia constricta</i>						0
<i>Alyxia ruscifolia</i>				C4	C5	
<i>Parsonsia straminea</i>				C4		

Taxon	C1	C2	C3	C4	C5	Opportunistic
Araceae						
<i>Alocasia brisbanensis</i>		C2	C3	C4		
<i>Gymnostachys anceps</i>		C2				
<i>Typhonium brownii</i>	C1	C2				
Araliaceae						
<i>Polyscias elegans</i>						0
<i>Polyscias murrayi</i>						0
<i>Polyscias sambucifolia</i> subsp. A	C1		C3			
Areceaceae						
<i>Archontophoenix cunninghamiana</i>		C2				
<i>Linospadix monostachya</i>						0
<i>Livistona australis</i>		C2		C4		
Asclepiadaceae						
<i>Gymnema pleiandenium</i>						0
* <i>Gomphocarpus fruticosus</i>	C1		C3			
<i>Marsdenia liisae</i>		C2			C5	
<i>Marsdenia lloydii</i>		C2	C3		C5	
Aspleniaceae						
<i>Asplenium attenuatum</i>						0
<i>Asplenium australasicum</i>	C1					
<i>Asplenium flabellifolium</i>						0
<i>Asplenium polydon</i>						0
Asteliaceae						
<i>Cordyline petiolaris</i>		C2	C3	C4	C5	
Asteraceae						
* <i>Bidens pilosa</i>						0
* <i>Bidens subalternans</i>						0
<i>Chrysocephalum apiculatum</i>	C1					
* <i>Cirsium vulgare</i>	C1		C3			
* <i>Conyza albida</i>	C1		C3			
* <i>Conyza bonariensis</i>						0
<i>Craspedia variabilis</i>	C1					
<i>Euchiton sphaericus</i>	C1					
* <i>Hypochoeris radicata</i>						0
<i>Olearia argophylla</i>					C5	
<i>Olearia heterocarpa</i>			C3			
<i>Olearia nernstii</i>					C5	
<i>Ozothamnus diosmifolius</i>		C2				
<i>Senecio amygdalifolius</i>		C2				
<i>Senecio lautus</i> subsp. <i>lanceolatus</i>	C1	C2	C3			
<i>Senecio</i> sp. E	C1	C2	C3			
* <i>Sigesbeckia orientalis</i> subsp. <i>orientalis</i>	C1		C3			
<i>Vernonia cinerea</i> var. <i>lanata</i>	C1	C2				
<i>Vittadinia tenuissima</i>			C3			

Taxon	C1	C2	C3	C4	C5	Opportunistic
Bignoniaceae						
<i>Pandorea jasminoides</i>						0
<i>Pandorea pandorana</i>		C2	C3		C5	
Blechnaceae						
<i>Blechnum cartilagineum</i>		C2				
<i>Blechnum nudum</i>						0
<i>Doodia aspera</i>	C1	C2				
<i>Doodia maxima</i>		C2				
Boraginaceae						
<i>Ehretia acuminata</i> var. <i>acuminata</i>						0
Campanulaceae						
<i>Wahlenbergia stricta</i> subsp. <i>stricta</i>						0
Capparaceae						
<i>Capparis arborea</i>		C2			C5	
Caryophyllaceae						
<i>Stellaria flaccida</i>						0
Casuarinaceae						
<i>Allocasuarina littoralis</i>						0
<i>Allocasuarina torulosa</i>	C1					
Celastraceae						
<i>Cassine australis</i> var. <i>australis</i>						0
<i>Celastrus subspicata</i>						0
<i>Denhamia celastroides</i>		C2		C4		
<i>Maytenus bilocularis</i>	C1	C2	C3		C5	
<i>Siphonodon australis</i>				C4	C5	
Clusiaceae						
<i>Hypericum gramineum</i>						0
Commelinaceae						
<i>Commelina cyanea</i>						0
<i>Pollia crispata</i>			C3	C4	C5	
Convolvulaceae						
<i>Dichondra repens</i>	C1		C3			
<i>Dichondra</i> sp. A						0
Crassulaceae						
<i>Crassula sieberiana</i>						0
Cucurbitaceae						
<i>Diplocyclos palmatus</i>						0
<i>Zehneria cunninghamii</i>	C1					

Taxon	C1	C2	C3	C4	C5	Opportunistic
Cyatheaceae						
<i>Cyathea australis</i>				C4		
Cyperaceae						
<i>Carex declinata</i>		C2				
<i>Carex inversa</i>	C1	C2	C3			
<i>Cyperus enervis</i>	C1	C2	C3	C4	C5	
<i>Cyperus tetraphyllus</i>		C2	C3	C4	C5	
<i>Fimbristylis dichotoma</i>						0
<i>Gahnia aspera</i>					C5	
<i>Gahnia melanocarpa</i>		C2				
<i>Gahnia sieberiana</i>	C1	C2			C5	
<i>Lepidosperma laterale</i>	C1	C2	C3			
<i>Schoenus apogon</i>						0
Davalliaceae						
<i>Arthropteris tenella</i>		C2		C4		
Dioscoraceae						
<i>Dioscorea transversa</i>						0
Dennstaedtiaceae						
<i>Calochlaena dubia</i>	C1	C2	C3	C4		
<i>Pteridium esculentum</i>	C1					
Dilleniaceae						
<i>Hibbertia obtusifolia</i>						0
<i>Hibbertia scandens</i>	C1	C2				
Dryopteridaceae						
<i>Lastreopsis decomposita</i>						0
<i>Lastreopsis munita</i>			C3	C4		
<i>Polystichum formosum</i>		C2	C3	C4		
Ebenaceae						
<i>Diospyros australis</i>		C2		C4	C5	
<i>Diospyros pentamera</i>			C3			
Elaeocarpaceae						
<i>Elaeocarpus obovatus</i>						0
Epacridaceae						
<i>Melichrus urceolatus</i>						0
Escalloniaceae						
<i>Quintinia sieberi</i>		C2	C3			
Euphorbiaceae						
<i>Acalypha capillipes</i> (S)						0
<i>Actephala lindleyi</i>						0

Taxon	C1	C2	C3	C4	C5	Opportunistic
Euphorbiaceae cont.						
<i>Alchornea ilicifolia</i>		C2			C5	
<i>Baloghia inophylla</i>		C2		C4		
<i>Breynia cernua</i>	C1	C2				
<i>Bridelia exaltata</i>		C2		C4	C5	
<i>Claoxylon australe</i>						O
<i>Cleistanthus cunninghamii</i>						O
<i>Croton insularis</i>						O
<i>Croton stigmatosus</i>						O
<i>Croton verreauxii</i>		C2				
<i>Drypetes australasica</i>		C2			C5	
<i>Mallotus philippensis</i>		C2				
<i>Phyllanthus similis</i>	C1				C5	
<i>Phyllanthus virgatus</i>	C1		C3			
<i>Poranthera microphylla</i>			C3			
Eupomatiaceae						
<i>Eupomatia bennettii</i>						O
<i>Eupomatia laurina</i>						O
Fabaceae						
<i>Acacia binervia</i>	C1					
<i>Acacia falciformis</i>	C1					
<i>Acacia irrorata</i> subsp. <i>irrorata</i>	C1	C2	C3			
<i>Acacia longifolia</i>	C1	C2	C3			
<i>Austrosteenisia blackii</i> var. <i>blackii</i>	C1	C2		C4	C5	
<i>Desmodium brachypodum</i>	C1	C2				
<i>Desmodium nemorosum</i>		C2				
<i>Desmodium rhytidophyllum</i>	C1	C2				
<i>Desmodium varians</i>	C1	C2	C3			
<i>Erythrina vespertilio</i>						O
<i>Glycine clandestina</i>	C1	C2	C3			
<i>Glycine microphylla</i>		C2				
<i>Glycine tabacina</i>	C1					
<i>Hardenbergia violacea</i>	C1					
<i>Hovea heterophylla</i>						O
<i>Indigofera australis</i>	C1					
<i>Jacksonia scoparia</i>	C1					
<i>Lespedeza juncea</i> subsp. <i>sericea</i>	C1					
<i>Lotus cruentus</i>		C2				
<i>Pararchidendron pruinatum</i> var. <i>pruinatum</i>						O
<i>Senna clavigera</i>			C3			
<i>Swainsona brachycarpa</i>	C1	C2	C3			
<i>Zornia dyctiocarpa</i> subsp. <i>dyctiocarpa</i>	C1					
Flacourtiaceae						
<i>Scolopia braunii</i>					C5	
Gentianaceae						
<i>Centaurium erythraea</i>	C1					

Taxon	C1	C2	C3	C4	C5	Opportunistic
Geraniaceae						
<i>Geranium solanderi</i> var. <i>solanderi</i>	C1	C2				
Goodeniaceae						
<i>Goodenia hederacea</i> var. <i>hederacea</i>						0
Haemodoraceae						
<i>Haemodorum planifolium</i>			C3			
Haloragaceae						
<i>Gonocarpus tetragynus</i>						0
Hypoxidaceae						
<i>Hypoxis exilis</i>	C1					
Icacinaceae						
<i>Citronella moorei</i>						0
Iridaceae						
<i>Patersonia sericea</i>						0
* <i>Sisyrinchium</i> sp. A	C1					
Juncaceae						
<i>Juncus usitatus</i>			C3			
<i>Luzula flaccida</i>						0
Lamiaceae						
<i>Ajuga australis</i>	C1					
<i>Plectranthus parviflorus</i>	C1		C3			
Lauraceae						
<i>Cassytha glabella</i>						0
<i>Cryptocarya obovata</i>				C4	C5	
<i>Cryptocarya triplinervis</i>						0
<i>Endiandra sieberi</i>				C4		
<i>Endiandra virens</i>		C2	C3	C4		
<i>Neolitsea australiensis</i>			C3	C4		
<i>Neolitsea dealbata</i>	C1	C2		C4	C5	
Lobeliaceae						
<i>Pratia purpurascens</i>			C3			
Lomandraceae						
<i>Lomandra filiformis</i>						0
<i>Lomandra longifolia</i>	C1	C2	C3		C5	
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	C1					
Luzuriagaceae						
<i>Eustrephus latifolius</i>	C1	C2	C3			
<i>Geitonoplesium cymosum</i>		C2				

Taxon	C1	C2	C3	C4	C5	Opportunistic
Malvaceae						
<i>Abutilon oxycarpum</i>		C2	C3			
<i>Hibiscus heterophyllus</i> subsp. <i>heterophyllus</i>	C2	C3	C4	C5		
Meliaceae						
<i>Dysoxylum fraserianum</i>						0
<i>Dysoxylum rufum</i>		C2				
<i>Melia azedarach</i>						0
<i>Synoum glandulosum</i>		C2		C4		
<i>Toona ciliata</i>						0
Menispermaceae						
<i>Legnephora moorei</i>						0
<i>Tinospora smilacina</i>		C2		C4	C5	
Monimiaceae						
<i>Daphnandra micrantha</i>						0
<i>Wilkiea huegeliana</i>				C4		
Moraceae						
<i>Ficus coronata</i>		C2				
<i>Ficus fraseri</i>						0
<i>Ficus macrophylla</i>						0
<i>Ficus superba</i> var. <i>henneana</i>						0
<i>Ficus watkinsiana</i>				C4	C5	
Myrsinaceae						
<i>Embelia australiana</i>						0
<i>Rapanea variabilis</i>	C1	C2		C4	C5	
Myrtaceae						
<i>Acmena ingens</i>				C4		
<i>Austromyrtus bidwillii</i>				C4	C5	
<i>Austromyrtus hillii</i>					C5	
<i>Backhousia sciadophora</i>					C5	
<i>Callistemon salignus</i>	C1	C2	C3			
<i>Corymbia citriodora</i> subsp. <i>variegata</i>	C1		C3			
<i>Corymbia gummifera</i>	C1					
<i>Eucalyptus acmenoides</i>	C1	C2	C3			
<i>Eucalyptus brunnea</i>	C1					
<i>Eucalyptus fibrosa</i>	C1	C2	C3		C5	
<i>Eucalyptus microcorys</i>	C1	C2	C3			
<i>Eucalyptus moluccana</i>	C1		C3			
<i>Eucalyptus propinqua</i>	C1		C3			
<i>Eucalyptus saligna</i>	C1	C2		C4		
<i>Eucalyptus siderophloia</i>						0
<i>Eucalyptus umbra</i>	C1					
<i>Lophostemon confertus</i>	C1	C2	C3	C4		
<i>Rhodamnia rubescens</i>		C2	C3			
<i>Syzygium francisii</i>						0

Taxon	C1	C2	C3	C4	C5	Opportunistic
Oleaceae						
<i>Notelaea longifolia</i>		C2				
<i>Olea paniculata</i>						0
Onagraceae						
<i>Epilobium billardierianum</i> subsp. <i>cinereum</i>						
Ophioglossaceae						
<i>Ophioglossum reticulatum</i>						0
Orchidaceae						
<i>Bulbophyllum elisae</i>					C5	
<i>Calanthe triplicata</i>						0
<i>Dendrobium bowmanii</i>					C5	
<i>Dendrobium fairfaxii</i>					C5	
<i>Dendrobium gracilicaule</i>					C5	
<i>Dendrobium monophyllum</i>					C5	
<i>Dendrobium schoeninum</i>					C5	
<i>Dendrobium speciosum</i>				C4	C5	
<i>Dendrobium tarberi</i>					C5	
<i>Dendrobium teretifolium</i>					C5	
<i>Eriochilus cucullatus</i>				C4		
<i>Plectorrhiza tridentate</i>						0
<i>Rhinerrhiza divitiflora</i>					C5	
<i>Sarcochilus falcatus</i>						0
<i>Sarcochilus weinthalii</i>					C5	
Oxalidaceae						
<i>Oxalis chnoodes</i>						0
<i>Oxalis perennans</i>		C2	C3			
Passifloraceae						
<i>Passiflora subpeltata</i>						0
Phormiaceae						
<i>Dianella caerulea</i> var. <i>assera</i>	C1	C2	C3	C4	C5	
<i>Dianella caerulea</i> var. <i>caerulea</i>	C1		C3			
<i>Dianella revoluta</i>						0
Pittosporaceae						
<i>Bursaria spinosa</i>						0
<i>Citriobatus pauciflorus</i>		C2	C3	C4	C5	
<i>Rhytidosporum procumbens</i>			C3			
Plantaginaceae						
<i>Plantago debilis</i>						0
<i>Plantago varia</i>	C1					
Poaceae						
<i>Agrostis avenacea</i>						0
<i>Cenchrus caliculatus</i>			C3			

Taxon	C1	C2	C3	C4	C5	Opportunistic
Poaceae cont.						
<i>Dichelachne sieberiana</i>	C1					
<i>Digitaria ramularis</i>	C1					
<i>Entolasia marginata</i>					C5	
<i>Imperata cylindrica</i> var. <i>major</i>	C1	C2	C3			
<i>Oplismenus imbecillis</i>	C1	C2	C3		C5	
<i>Oplismenus undulatifolius</i>						0
<i>Paspalidium distans</i>					C5	
<i>Poa sieberiana</i>	C1	C2	C3			
<i>Sorghum leiocladum</i>	C1		C3			
<i>Themeda triandra</i>	C1		C3			
Polygalaceae						
<i>Polygala japonica</i>	C1					
Polygonaceae						
<i>Rumex brownii</i>						0
Polypodiaceae						
<i>Platycterium superbum</i>	C1	C2		C4	C5	
<i>Pyrrosia confluens</i> var. <i>dielsii</i>					C5	
<i>Pyrrosia rupestris</i>	C1				C5	
Primulaceae						
* <i>Anagallis arvensis</i>						0
Proteaceae						
<i>Grevillea robusta</i>				C4	C5	
<i>Persoonia cornifolia</i>						0
Pteridaceae						
<i>Pteris umbrosa</i>						0
Ranunculaceae						
<i>Clematis glycinoides</i>	C1	C2				
<i>Ranunculus lappaceus</i>	C1					
Rhamnaceae						
<i>Alphitona excelsa</i>						0
Ripogonaceae						
<i>Ripogonium album</i>						0
Rosaceae						
<i>Acaena novae-zealandiae</i>						0
<i>Rubus moluccanus</i> var. <i>moluccanus</i>	C1					
<i>Rubus parvifolius</i>	C1					
<i>Rubus rosifolius</i>	C1	C2				

Taxon	C1	C2	C3	C4	C5	Opportunistic
Rubiaceae						
<i>Asperula conferta</i>						0
<i>Canthium vacciniifolium</i>				C4	C5	
<i>Galium migrans</i>		C2	C3			
<i>Ixora beckleri</i>						0
<i>Morinda jasminoides</i>		C2			C5	
<i>Pomax umbellata</i>						0
<i>Psychotria daphnoides</i>			C3		C5	
<i>Psychotria loniceroides</i>		C2	C3	C4	C5	
Rutaceae						
<i>Acronychia oblongifolia</i>			C3			
<i>Correa reflexa</i> var. <i>reflexa</i>						0
<i>Flindersia australis</i> (S)				C4	C5	
<i>Flindersia collina</i>	C1					
<i>Flindersia schottiana</i>		C2				
<i>Flindersia xanthoxyla</i> (S)				C4	C5	
<i>Geijera latifolia</i>						0
<i>Geijera salicifolia</i>				C4		
<i>Melicope elleryana</i> (S)						0
<i>Melicope erythrococca</i>		C2		C4		
<i>Melicope micrococca</i>			C3	C4		
<i>Sarcomelicope simplicifolia</i> subsp. <i>simplicifolia</i>						0
<i>Zanthoxylum brachyacanthum</i> (S)		C2	C3	C4	C5	
Santalaceae						
<i>Exocarpus cupressiformis</i>						0
Sapindaceae						
<i>Alectryon subcinereus</i>				C4	C5	
<i>Alectryon subdentatus</i>						0
<i>Arytera divaricata</i>						0
<i>Atalaya hemiglauca</i> (S)						0
<i>Atalaya salicifolia</i>					C5	
<i>Cupaniopsis parvifolia</i>					C5	
<i>Diploglottis australis</i>						0
<i>Dodonaea viscosa</i>	C1					
<i>Elatostachys nervosa</i>						0
<i>Elatostachys xylocarpa</i>						0
<i>Guioa semiglauca</i>		C2				
<i>Jagera pseudorhus</i> var. <i>pseudorhus</i>	C1		C3	C4		
<i>Rhysotoechia bifoliata</i>						0
<i>Sarcopteryx stipitata</i>						0
Sapotaceae						
<i>Planchonella australis</i>						0
Scrophulariaceae						
<i>Veronica calycina</i>	C1		C3			

Taxon	C1	C2	C3	C4	C5	Opportunistic
Simaroubaceae						
<i>Ailanthus triphysa</i>						0
Sinopteridaceae						
<i>Cheilanthes sieberi</i>						0
Smilacaceae						
<i>Smilax australis</i>	C1	C2	C3	C4	C5	
Solanaceae						
<i>Nicotiana debneyi</i> subsp. <i>debneyi</i>						0
<i>Solanum campanulatum</i>	C1		C3		C5	
<i>Solanum densevestitum</i>	C1	C2	C3			
<i>Solanum opacum</i>			C3			
<i>Solanum pungetium</i>					C5	
<i>Solanum stelligerum</i>	C1	C2	C3			
Stackhousiaceae						
<i>Stackhousia viminea</i>						0
Sterculiaceae						
<i>Brachychiton discolor</i>						0
<i>Brachychiton populneus</i>						0
<i>Commersonia fraseri</i>						0
Stylidiaceae						
<i>Stylidium graminifolium</i>						0
Thymelaeaceae						
<i>Pimelea latifolia</i> subsp. <i>hirsuta</i>		C2				
<i>Pimelea neo-anglica</i>	C1		C3			
<i>Pimelea strigosa</i>		C2	C3			
Ulmaceae						
<i>Aphananthe philippinensis</i>					C5	
Urticaceae						
<i>Dendrocnide excelsa</i>		C2		C4		
<i>Dendrocnide photinophylla</i>		C2				
<i>Elatostemma reticulatum</i>						0
<i>Urtica incisa</i>			C3			
Verbenaceae						
<i>Gmelina leichhardtii</i>					C5	
* <i>Lantana camara</i>	C1	C2	C3	C4	C5	
* <i>Verbena officinalis</i>		C2	C3			
Violaceae						
<i>Hybanthus monopetalus</i>	C1					
<i>Hybanthus stellarioides</i>	C1		C3			

Taxon	C1	C2	C3	C4	C5	Opportunistic
Violaceae cont.						
<i>Viola betonicifolia</i>	C1					
<i>Viola hederacea</i>	C1	C2		C4		
Vitaceae						
<i>Cayratia clematidea</i>	C1	C2			C5	
<i>Cissus antarctica</i>	C1	C2	C3	C4	C5	
<i>Cissus hypoglauca</i>						0
<i>Cissus opaca</i>	C1					
<i>Tetrastigma nitens</i>						
Xanthorrhoeaceae						
<i>Xanthorrhoea glauca</i>	C1		C3			
Zamiaceae						
<i>Macrozamia fawcettii</i>	C1	C2	C3			
Zingiberaceae						
<i>Alpinia caerulea</i>	C1	C2		C4		