Vegetation and floristics of the Demon Nature Reserve, Tenterfield, New South Wales

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A floristic survey of 40 × 0.1 ha plots within the Demon Nature Reserve, 30 km east-south-east (lat. 29°05'S, long 152°15'E) of Tenterfield, was conducted in March, 1997. The Reserve (887 hectares in area) is on a western facing escarpment ranging from 500–1000 m above sea level. The survey data were analysed and seven vegetation communities defined. This paper describes the seven communities and discusses their significance and distribution within the reserve. A vegetation map and plant species list are provided.

Introduction

The Demon Nature Reserve is located approximately 30 km ESE of Tenterfield (lat 29°05'S, long 152°15'E) on the Timbarra Plateau, between Demon Creek and Poverty Point Fire Trail, within the Tenterfield Local Government Area on the Northern Tablelands of New South Wales. It was designated on 22 December 1995, prior to which it formed part of the Malara State Forest in the Tenterfield Management District and a small section was a Camping Reserve for traveling stock managed by the Rural Lands Protection Board. While under the management of the NSW State Forests, the area was used for winter grazing and burnt on a regular three to five year cycle. Parts of the Reserve, particularly above 900 m altitude, were logged between 1980 and 1989 (State Forests of NSW 1995).

The Reserve (887 ha in area), is located on granites of the New England Batholith, and features plateau and escarpment areas with steep ridges and gullies and westerly flowing streams. Elevation ranges from 460 to 1060 m and is lowest at the western boundary and highest in the east. The vegetation consists predominantly of open forest, woodland and rainforest. In addition, heathland is present on outcrops and sedgeland occurs in low-lying areas and depressions.

Previous flora survey work has been carried out in the vicinity of the reserve particularly by the State Forests of NSW (Binns 1995), and also by Capricornia Prospecting (1995) for an environmental impact statement on a proposed gold mine. Only one previous vegetation survey plot had been located within the reserve itself.

This paper represents part of the results from a flora survey conducted on behalf of the Glen Innes District National Parks and Wildlife Service to assist in the development of appropriate management strategies for the nature reserve (ERM Mitchell-McCotter 1998).

Climate

The climate of the Timbarra Plateau is cool-temperate, with cold winters and mild summers. The rainfall maximum is in summer (46% of the total rainfall), with a mean annual fall of c. 1000 mm. Light snow falls are known to occur in some years between May and October at the higher elevations (State Forests of New South Wales 1995). At Tenterfield the mean maximum and minimum temperatures in July are 1°C and 14°C respectively and are 13°C and 26°C in December (RACAC 1996). Winds are mainly north-easterly to easterly between October and May and south-westerly between June and September (State Forests of NSW 1995).

Geology and soils

The geology of the Timbarra Plateau is a composite of the later Permian to Early Triassic Stanthorpe and Bungulla Adamellites (Capricornia Prospecting 1995). Stanthorpe Adamellite occurs throughout the reserve (State Forests of New South Wales 1995). A small portion of microgranite occurs in the south-eastern portion of the reserve (pers. obs. J.T.H.) and also a minor occurrence of Quaternary alluvium deposits with subsequent peat formation. The western boundary of the reserve is marked by the Demon Fault which extends north and south from approximately Tenterfield to Ebor.

Methods

After aerial photographs, geological and topographic maps were consulted a stratified random sampling method was used in order to locate floristic survey sites. Forty allocated sites were surveyed using nested quadrats. For replication purposes the reserve was divided into three approximately equal sections and these were stratified into four elevation classes (200 m bands) and three aspect classes (North, West and South). In addition, special communities that are often missed in stratified sampling due to their minor and restricted occurrences were also targeted (rock outcrops and wetlands). Due to the rugged terrain of steep cliffs and gullies, not all areas were thoroughly surveyed.

The nested quadrat design was described by Bunce and Shaw (1973) and initially tested by Outhred (1984). This method is based on a series of smaller (nested) quadrats that decrease in size geometrically within a larger quadrat. Studies by Outhred (1984), Outhred et al. (1985), Le Brocque and Buckney (1995), Morrison, Cary et al. (1995), and Morrison, Le Brocque et al. (1995) have shown this method capable of detecting subtle community patterns by being functionally equivalent to frequency and directly related to plant density. The method was modified to enable approximately 0.1 ha to be surveyed and a frequency score of ten to be given to each taxon found. Each quadrat was marked out by the placement of four 30 m measuring tapes marking the diagonals. Markings were placed on the measuring tapes at distances from the centre of the quadrat at 1, 1.4, 2, 2.8, 4, 5.7, 8, 11.2, 16 and 22.5 m. This divided the total quadrat into nine sub-quadrats of approximate cumulative area; 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024 m^2. All vascular plant species were recorded for each quadrat. The

presence or absence of a taxon in each of the nine subquadrats gave a frequency score out of ten for each taxon, providing a measure of relative abundance. This same alteration in design has been used by Clarke et al. (1995), Clarke et. al. (1998) and Hunter and Clarke (1998) for vegetation surveys in north-east NSW. Where topographic features were linear in nature (e.g. creeks) a linear version of this method was used which did not compromise the sampling design. This was achieved by extending the last two subquadrats on one side (retaining the same area), thereby creating a rectangular plot.

The survey was carried out over three weeks during March 1997. A total of 320 voucher specimens were collected, and these are held by the Glen Innes District of the National Parks and Wildlife Service. Duplicate material was incorporated within the NCW Beadle Herbarium of the University of New England, Armidale (NE). Nomenclature follows Harden (1990–1993) except where subsequent relevant 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 was performed using the Kulczynski association measure which is recommended for ecological applications (Belbin 1995a, b) along with flexible UPGMA and the default PATN settings.

Vegetation mapping was prepared as part of the survey and is based on the PATN analysis results presented here. Delineation of community boundaries was based on the location of sites and their position within the multivariate analysis and on subsequent air photo interpretation and ground truthing.

Results

A total of 365 taxa were recorded from 95 families during the survey of the Demon Nature Reserve (Appendix). Seven communities were distinguished within the reserve at a dissimilarity measure of c. 0.75 (Figs. 1 & 2).

A number of nationally rare or threatened taxa were discovered within the reserve. These included: *Acacia floydii* (2RC-), *Acacia orites* (2RC-), *Acianthus exiguus* (3RC-) (Schedule 2 Vulnerable Species under the TSC Act 1995), *Eucalyptus dorrigoensis* (3KC-), *Prostanthera* sp. B (2RC-) (Briggs & Leigh 1996), *Eucalyptus scias* subsp. *apoda* (3V-) (Quinn et al. 1995), and *Philotheca myoporoides* subsp. *epilosus* (3RCa) (Richards & Hunter 1997). Additionally, infertile specimens of some taxa are of potential interest, particularly a specimen with affinities to *Pomaderris notata* (2RC-t), and a *Pultenaea* sp. aff. *obovata* specimen that does not conform to a recognised taxon.

Few exotic taxa were noted within the reserve and most of these were taxa that are generally ubiquitous to the region and often occur in undisturbed communities. The most common and abundant of these was *Hypochaeris radicata*. Other taxa include: *Gomphocarpus physocarpus, Conyza albida, Gnaphalium americanum, Bidens pilosa* and *Centaurium erythraea*.

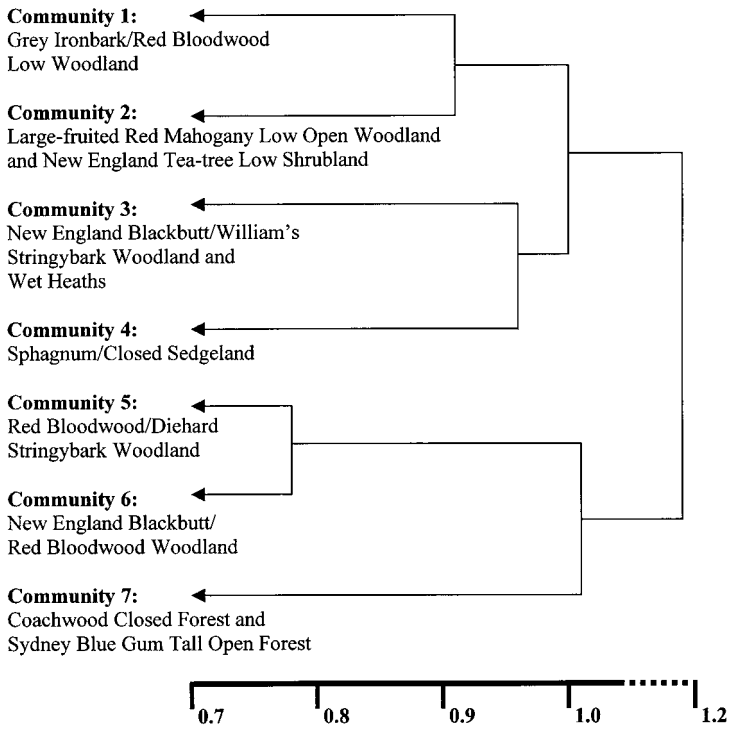

Fig. 1. Summary dendrogram of the communites defined within Demon Nature Reserve produced by the Kulczynski association measure.

Plant communities

The taxa in each community are listed below according to their importance, which has been based on the number of quadrats in which they occurred (fidelity) and their total summed frequency score (relative abundance).

Community 1: Grey Ironbark–Red Bloodwood Low Woodland (*Eucalyptus fusiformis–Corymbia gummifera*)

Trees: *Eucalyptus fusiformis, Corymbia gummifera, Eucalyptus propinqua, Lophostemon confertus.*
Shrubs: *Acacia diphylla, Melichrus urceolatus, Hibbertia obtusifolia, Phyllanthus gunnii, Mirbelia pungens.*
Herbs: *Pomax umbellata, Cymbopogon refractus, Aristida jerichoensis, Opercularia hispida, Trachymene incisa, Entolasia stricta, Vernonia cinerea, Restio stenocoleus, Cheilanthes sieberi* subsp. *sieberi, Gahnia aspera.*
Notes: This community occurs at lower altitudes and has a distinct understorey of *Acacia* that often forms dense stands along the Demon Fault. (116 taxa).

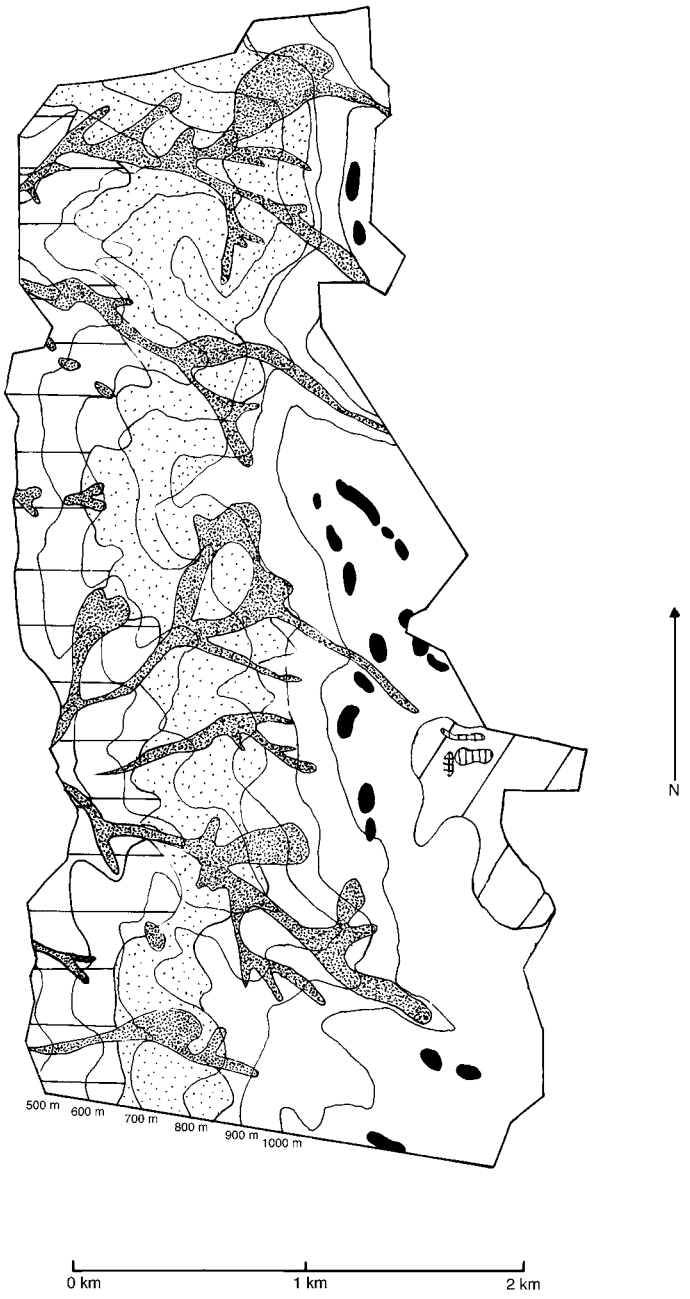

Fig. 2. Vegetation map of Demon Nature Reserve. Coachwood Closed Forest–Sydney Blue Gum Tall Open Forest (heavy stippling); Grey Iron bark–Red Bloodwood Low Woodland (horizontal bars); Large-fruited Red Mahogany Low Open Woodland & New England Tea-tree Low Shrubland (black); New England Blackbutt–William's Stringybark Woodland (diagonal bars) and Wet Heaths (vertical bars); Sedgeland (hatching); Red Bloodwood–Diehard Stringybark Woodland (light stippling); New England Blackbutt–Red Bloodwood Woodland (clear). Elevation bars are in 100 m intervals (500–1000 m). Scale bar = 2 km.

Community 2: Large-fruited Red Mahogany Low Open Woodland and New England Tea-tree Low Shrubland (*Eucalyptus scias* subsp. *apoda–Allocasuarina littoralis*)

Trees: *Eucalyptus scias* subsp. *apoda*, *Allocasuarina littoralis*.
Shrubs: *Acrotriche aggregata*, *Leucopogon lanceolatus*, *Acacia floydii*, *Leptospermum novae-angliae*, *Leptospermum polygalifolium* subsp. *transmontanum*.
Herbs: *Entolasia stricta*, *Trachymene incisa*, *Brachyscome stuartii*, *Lomandra longifolia*, *Gonocarpus teucrioides*, *Pomax umbellata*, *Dianella caerulea*, *Stylidium laricifolium*, *Themeda triandra*, *Laxmannia compacta*.
Notes: This community is scattered throughout the upper altitudes along the escarpment on granitic outcrops. Several restricted taxa occur and include: *Eucalyptus scias* subsp. *apoda*, *Acacia floydii*, *Prostanthera* sp. B, *Philotheca myoporoides* subsp. *epilosus*. (114 taxa).

Community 3: New England Blackbutt–William's Stringybark Shrubby Woodland and Wet Closed Heaths (*Eucalyptus campanulata–Eucalyptus williamsiana–Eucalyptus cameronii*)

Trees: *Allocasuarina littoralis*, *Eucalyptus campanulata*, *Eucalyptus williamsiana*, *Eucalyptus cameronii*, *Eucalyptus dorrigoensis*.
Shrubs: *Dampiera stricta*, *Dillwynia phylicoides*, *Petrophile canescens*, *Pimelea linifolia*, *Leptospermum trinervium*, *Monotoca scoparia*, *Persoonia oleoides*, *Acacia ulicifolia*, *Daviesia villifera*, *Melichrus procumbens*.
Herbs: *Stylidium graminifolium*, *Platysace ericoides*, *Entolasia stricta*, *Austrostipa pubescens*, *Amperea xiphoclada*, *Pteridium esculentum*, *Goodenia bellidifolia*, *Patersonia glabrata*, *Patersonia sericea*, *Lepidosperma gunnii*.
Notes: A small occurrence of this community can be found on the plateau at the southern end of the reserve. The community includes two major sub-communities: wets heaths and logged woodlands. The restricted species *Eucalyptus dorrigoensis* was found along a creek margin within this community. (72 taxa).

Community 4: Sphagnum–Sedgeland (*Lepidosperma limicolum–Baeckea omissa*)

Shrubs: *Baeckea omissa*, *Epacris obtusifolia*, *Callistemon citrinus*, *Epacris microphylla*, *Leptospermum brachyandrum.*
Herbs: *Lepidosperma limicolum*, *Caustis flexuosa*, *Drosera binata*, *Thelionema caespitosa*, *Schoenus brevifolius*.
Notes: This was the most restricted community within the reserve occupying only 0.1 ha. (35 taxa).

Community 5: Red Bloodwood–Diehard Stringybark Woodland (*Corymbia gummifera–Eucalyptus cameronii*)

Trees: *Corymbia gummifera*, *Eucalyptus cameronii*, *Allocasuarina torulosa*, *Eucalyptus campanulata*, *Angophora floribunda*.
Shrubs: *Podolobium ilicifolium*, *Melichrus urceolatus*, *Persoonia sericea*, *Hibbertia obtusifolia*, *Acrotriche aggregata*.

Herbs: *Dianella caerulea, Pomax umbellata, Lepidosperma laterale, Lomandra confertifolia, Desmodium varians, Dichelachne rara, Themeda triandra, Imperata cylindrica, Vernonia cinerea, Lomandra multiflora*.
Notes: This community is common throughout intermediate altitudes. Restricted taxa include *Acacia floydii, Eucalyptus scias* subsp. *apoda* and *Acacia orites*. (131 taxa).

Community 6: New England Blackbutt–Red Bloodwood Woodland (*Eucalyptus campanulata–Corymbia gummifera*)

Trees: *Banksia integrifolia, Eucalyptus campanulata, Allocasuarina littoralis, Corymbia gummifera, Allocasuarina torulosa, Eucalyptus scias* subsp. *apoda, Eucalyptus oreades, Eucalyptus cameronii*.
Shrubs: *Hibbertia obtusifolia, Leucopogon lanceolatus, Acacia falciformis, Persoonia oleoides*.
Herbs: *Viola betonicifolia, Lomandra longifolia, Platysace ericoides, Imperata cylindrica, Glycine microphylla, Geranium solanderi, Gonocarpus teucrioides, Dianella caerulea, Desmodium varians*.
Notes: This community is widespread throughout the plateau and upper parts of the escarpment. The restricted species *Eucalyptus dunnii, Eucalyptus scias* subsp. *apoda*, *Acacia floydii* and *Acianthus exiguus* occur here. (170 taxa).

Community 7: Coachwood Closed Forest and Sydney Blue Gum Tall Open Forest (*Callicoma serratifolia–Ceratopetalum apetalum*)

Trees: *Allocasuarina torulosa, Callicoma serratifolia, Backhousia myrtifolia, Ceratopetalum apetalum, Quintinia sieberi*.
Shrubs: *Trochocarpa laurina, Senecio amygdalifolius, Acacia floydii, Alyxia ruscifolia, Notelaea* sp. *A*.
Vines: *Cephalaralia cephalobotrys, Eustrephus latifolius, Parsonsia straminea, Rubus parvifolius, Cissus hypoglauca*.
Herbs: *Blechnum cartilagineum, Lomandra longifolia, Desmodium varians, Doodia aspera, Hypolepis glandulifera*.
Notes: This community is common in the gullies and on south facing protected slopes. Two sub-communities can be distinguished here, namely a Closed Forest component and the surrounding Tall Open Forest with a closed forest emergent canopy underneath. Often the Tall Open Forest is narrow and is usually dominated by *Lophostemon confertus* and *Eucalyptus saligna*. Restricted species include *Acacia orites, Acacia floydii* and *Eucalyptus scias* subsp. *apoda*. (134 taxa).

Discussion

Topography and disturbance history have been important in determining the distribution of communities within Demon Nature Reserve. Community 7 was restricted to deeply incised gullies that were protected from western exposure and the regular fires that have occurred. This community is depauperate in comparison to other Closed Forests described for the Timbarra Plateau (Capricornia Prospecting

1995, Binns 1995) but is typical in its floristic assemblage. Floyd (1990) describes similar associations within the *Ceratopetalum* Alliance in warm-temperate rainforest. These associations are distributed throughout north-eastern New South Wales. Community 7 has the potential for expansion if fires become less regular, particularly within gullies and along creeklines on the plateau area of the reserve.

The three most widespread communities within the reserve were all of woodland formation. These communities were banded topographically. Community 1 occurred at the lowest altitudes, being replaced at mid altitudes by Community 5, which was then replaced on the escarpment edge and plateau areas by Community 6. Community 6 was the most disturbed community within the reserve with recent forest harvesting, regular low intensity fires and grazing. A noticeable feature of Community 1 was a very dense understorey of *Acacia* which coincided with the trace of the Demon Fault. This was readily discernible on aerial photographs and viewing points that overlooked the reserve. At present, we have no explanation for this. Locally, Communities 1, 5 and 6 are widespread throughout the escarpment and plateau areas of the whole Timbarra Plateau (Capricornia Prospecting 1995). Only a small portion of Community 3 was found within the reserve, however, it appears to be widespread throughout the plateau.

In the analysis a number of restricted and specialised communities were defined. Community 4 was restricted to a very small area of impeded drainage on the plateau and was within 50 m of the only access road, thus representing the most restricted and potentially vulnerable community within the reserve. Communities containing sphagnum are highly restricted on the Northern Tablelands, occurring only at higher altitudes with mean annual rainfalls between 1000–1300 mm (Beadle 1981). Similar communities are known to occur within Boonoo Boonoo, Bald Rock, Gibraltar Range, New England and Cathedral Rock National Parks and the Serpentine Nature Reserve on the Northern Tablelands. Community 2 was restricted to small rock outcrops within the reserve. It is depauperate in species and diversity in comparison to other more complex communities found on the Timbarra Plateau, particularly in the east. Binns (1995) and Hunter & Clarke (1998) describe granitic outcrop communities for the region. Community 3a and 4a of Hunter & Clarke (1998) are directly synonymous with Community 2. Unlike most rock outcrop communities on the eastern escarpment of the Northern Tablelands, Community 2 is more open in structure, being a shrubland rather than closed heath. Community 2 is devoid of some of the more common components usually found in rock outcrop communities on the eastern escarpment such as *Kunzea bracteolata* or *Leptospermum novae-angliae,* which are largely absent here.

Restricted taxa

A number of nationally rare and or threatened taxa were found within the reserve. *Acacia floydii, A. orites* and *Eucalyptus scias* subsp. *apoda* were present in large numbers throughout most of the reserve. Of particular note is *Eucalyptus scias* subsp. *apoda*, as this represents the only known occurrence in a conservation reserve. Johnson & Hill (1990) when describing this taxon indicated that it was usually confined to swampy sites, however we found this taxon was most common on shallow, well drained soils,

on and surrounding, granitic outcrops. The recording of *Philotheca myoporoides* subsp. *epilosus* within the reserve confirms the decision of Richards and Hunter (1997) to downgrade the coding of this species to 3RCa. Two taxa of particular note are the two varieties of *Lasiopetalum ferrugineum* which both occur within the reserve. The finding of *Lasiopetalum ferrugineum* var. *cordatum* is an additional record of this taxon to those found in Butterleaf National Park for the Northern Tablelands (Richards & Hunter 1997) and the record of *Lasiopetalum ferrugineum* var. *ferrugineum* represents the first recording of this variety for the Northern Tablelands. *Acianthus exiguus* is the only species currently listed on the *Threatened Species Conservation Act* (New South Wales Government 1995).

Conclusion

Although small, the Demon Nature Reserve has a number of communities that are representative of those found throughout the Timbarra Plateau. Some of these are also representative of far more widespread communities typical of the eastern portion of the Northern Tablelands and the associated escarpment areas. Other communities such as those found on rock outcrops, or on impeded drainage, are very small and depauperate compared to what is known for the Timbarra Plateau or the region in general. It is likely that sampling at other times of the year will yield further records, additionally some of the more inaccessible areas of the reserve that were not sampled intensively. Due to past management history and the subsequent change in management strategies (for example no further selective logging, a reduced fire regime, and exclusion of grazing), it is likely that the extent, and in some instances the composition of the seven communities described here will change.

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Appendix: List of vascular plant taxa recorded from the Demon Nature Reserve with recognised authorities for taxa with new nomenclature since Harden (1990–1993). Taxa are scored according to their occurrence in each of the seven flexible UPGMA communities defined.
*** denotes introduced species.**

	C1	C2	C3	C4	C5	C6	C7
PTERIDOPHYTES AND ALLIES							
Adiantaceae							
Adiantum aethiopicum							X
Adiantum hispidulum						X	X
Aspleniaceae							
Asplenium australasicum							X
Asplenium flavellifolium		X			X	X	X
Blechnaceae							
Blechnum cartilagineum						X	X
Blechnum wattsii							X
Doodia aspera							X
Davalliaceae							
Davallia pyxidata					X	X	
Dennstaedtiaceae							
Dennstaedtia davallioides							X
Hypolepis glandulifera					X	X	X
Pteridium esculentum		X	X	X	X	X	X
Gleicheniaceae							
Gleichenia dicarpa							X
Sticherus lobatus							X
Lindsaeaceae							
Lindsaea linearis			X		X	X	
Lindsaea microphylla							X
Lycopodiaceae							
Lycopodium laterale				X			
Osmundaceae							
Todea barbara							X
Polypodiaceae							
Dictymia brownii							X
Grammitis billardieri							X
Microsorum postulatum							X
Platycerium bifurcatum subsp. *bifurcatum*				X		X	X
Pyrrosia confluens		X			X	X	X
Pyrrosia rupestris		X					X
Schizaeaceae							
Schizaea bifida		X					
Selaginellaceae							
Selaginella uliginosa			X	X			
Sinopteridaceae							
Cheilanthes distans	X						
Cheilanthes sieberi subsp. *sieberi*	X	X			X	X	
Pellaea falcata var. *nana*	X						X

	C1	C2	C3	C4	C5	C6	C7
MONOCOTYLEDONS							
Anthericaceae							
Arthropodium milleflorum	X				X	X	
Laxmannia compacta		X					
Thysanotus tuberosus subsp. *tuberosus*		X	X		X	X	X
Tricoryne anceps subsp. *erocaulon*	X						
Araceae							
Gymnostachys anceps						X	X
Asteliaceae							
Cordyline petiolaris							X
Commelinaceae							
Commelina cyanea	X	X			X	X	
Cyperaceae							
Bulbostylis densa		X					
Caustis flexuosa				X			
Cyperus imbecillis	X					X	
Cyperus lhotskyanus	X						
Fimbristylis dichotoma	X	X			X	X	
Gahnia aspera	X				X		X
Gahnia sieberiana						X	X
Gymnoschoenus sphaerocephalus							X
Lepidosperma gunnii			X				
Lepidosperma laterale	X	X	X		X	X	X
Lepidosperma limicolum			X	X			
Lepidosperma tortuosum			X	X	X		
Schoenus apogon		X				X	
Schoenus brevifolius		X	X	X		X	
Schoenus melanostachys	X		X				
Scleria mackaviensis	X						
Tricostularia pauciflora				X			
Haemodoraceae							
Haemodorum planifolium	X		X		X	X	
Hypoxidaceae							
Hypoxis exilis						X	
Iridaceae							
Patersonia fragilis				X			
Patersonia glabrata		X	X		X	X	
Patersonia sericea						X	
Juncaceae							
Juncus remotiflorus						X	
Lomandraceae							
Lomandra confertifolia subsp. *rubiginosa*	X	X			X	X	X
Lomandra filiformis subsp. *filiformis*	X		X		X	X	
Lomandra longifolia	X	X			X	X	X
Lomandra multiflora	X		X		X	X	X
Luzuriagaceae							
Eustrephus latifolius	X	X			X	X	X

	C1	C2	C3	C4	C5	C6	C7
Orchidaceae							
Acianthus apprimus	X	X	X		X	X	X
Acianthus exiguus						X	
Bulbophyllum bracteatum		X					
Bulbophyllum elisae		X		X			
Bulbophyllum exiguum							X
Chiloglottis diphylla			X				
Chiloglottis sp.		X		X	X	X	
Cryptostylis subulata		X	X				X
Dendrobium kingianum		X			X		X
Dendrobium speciosum		X					X
Dipodium variegatum						X	
Eriochilus cucullatus						X	
Prasophyllum patens						X	
Pterostylis decurva							X
Pterostylis longifolia			X		X		
Pterostylis reflexa					X	X	
Spiranthes sinensis var. *australis*				X			
Thelymitra sp.			X			X	
Phormiaceae							
Dianella caerulea var. *assera*		X				X	X
Dianella caerulea var. *caerulea*	X	X	X		X	X	
Stypandra glauca		X					
Thelionema caespitosum				X			
Poaceae							
Aristida jerichoensis var. *subspinulifera*	X	X	X		X		
Austrodanthonia induta (Vickery) H.P. Linder			X	X			
Austrodanthonia tenuior (Steud.) H.P. Linder					X		
Austrostipa pubescens (R.Br.) S.W.L.Jacobs & J.Everett		X	X	X	X	X	X
Cymbopogon refractus	X				X	X	
Dichelachne rara	X	X	X		X	X	
Deyeuxia gunniana				X	X	X	X
Deyeuxia mckiei	X					X	X
Digitaria breviglumis	X	X			X	X	
Digitaria longiflora	X	X					
Echinopogon ovatus	X	X			X	X	X
Entolasia marginata	X						
Entolasia stricta	X	X	X		X	X	X
Eragrostis elongata	X	X		X	X		
Imperata cylindrica	X	X			X	X	X
Microlaena stipoides var. *stipoides*	X				X	X	
Oplismenus aemulus	X				X	X	X
Oplismenus imbecillis	X						
Panicum simile	X					X	
Paspalidium constrictum	X						
Poa sieberiana	X	X	X		X	X	X
Sorghum leiocladum					X		
Themeda australis	X	X			X	X	
Thonandia longifolia (R.Br.) P. Linder	X						
Tripogon loliiformis	X	X					

	C1	C2	C3	C4	C5	C6	C7
Restionaceae							
Baloskion stenocoleum (L.A. Johnson & O.D. Evans) B.G. Briggs & L.A.S. Johnson	X		X	X			
Lepyrodia scariosa			X	X			
Smilacaceae							
Smilax australis			X		X	X	X
Smilax glyciphylla		X				X	X
Xanthorrhoeaceae							
Xanthorrhoea johnsonii			X			X	
Xanthorrhoea malacophylla							X
Xanthorrhoea media						X	
Xyridaceae							
Xyris operculata				X			
DICOTYLEDONS							
Apiaceae							
Hydrocotyle geraniifolia	X	X	X	X	X	X	
Platysace ericoides		X	X		X	X	
Trachymene incisa		X				X	
Apocynaceae							
Alyxia ruscifolia							X
Parsonsia straminea	X					X	X
Araliaceae							
Cephalaralia cephalobotrys							X
Polyscias sambucifolius						X	X
Asclepiadaceae							
**Gomphocarpus physocarpus*							X
Asteraceae							
**Bidens pilosa*	X						
Brachyscome microcarpa	X			X			
Brachyscome stuartii		X				X	
Bracteantha bracteatum						X	X
Cassinia aculeata		X					
Chrysocephalum apiculatum	X				X		
Chrysocephalum semipapposum						X	
Craspedia canens						X	
Conyza albida	X				X	X	
Glossogyne tannensis	X						
Gnaphalium americanum	X	X				X	X
Helichrysum boormanii		X				X	
Helichrysum scorpioides					X	X	
**Hypochaeris radicata*	X	X			X	X	
Lagenifera gracilis	X	X			X	X	X
Lagenifera stipitata							
Olearia argophylla							X
Olearia oppositifolia						X	
Ozothamnus diosmifolius		X					
Podolepis neglecta					X	X	
Senecio amygdalifolius					X	X	X
Senecio bipinnatisectus						X	
Senecio diaschides					X		
Senecio sp. E	X	X			X	X	X
**Sigesbeckia orientalis* subsp. *orientalis*	X				X	X	

	C1	C2	C3	C4	C5	C6	C7
Asteraceae cont.							
Solenogyne bellioides						X	X
Vernonia cinerea var. *cinerea*	X				X	X	X
Vittadinia cervicularis	X						
Bignoniaceae							
Pandorea pandorana	X						X
Campanulaceae							
Wahlenbergia communis	X				X	X	
Wahlenbergia luteola	X	X			X	X	
Casuarinaceae							
Allocasuarina littoralis		X	X		X	X	
Allocasuarina torulosa	X	X			X	X	X
Celastraceae							
Celastrus australis							X
Denhamia celastroides							X
Maytenus bilocularis							X
Maytenus silvestris	X	X			X	X	X
Siphonodon australis							X
Clusiaceae							
Hypericum gramineum	X	X		X	X	X	
Convolvulaceae							
Dichondra repens	X				X	X	
Polymeria calycina	X						
Crassulaceae							
Crassula decumbens var. *decumbens*	X					X	
Cunoniaceae							
Caldcluvia paniculosa							X
Callicoma serratifolia						X	X
Ceratopetalum apetalum							X
Schizomeria ovata							X
Dilleniaceae							
Hibbertia aspera						X	
Hibbertia cistoidea		X					
Hibbertia dentata						X	X
Hibbertia obtusifolia	X	X	X		X	X	X
Hibbertia riparia						X	
Hibbertia scandens		X				X	X
Droseraceae							
Drosera auriculata		X				X	
Drosera binata				X			
Drosera spatulata				X			
Elaeocarpaceae							
Elaeocarpus reticulatus						X	X
Epacridaceae							
Acrotriche aggregata		X			X	X	X
Brachyloma daphnoides subsp. *glabrum* (Blakely) J.T. Hunter			X				
Epacris microphylla var. *microphylla*			X	X			
Epacris obtusifolia				X			

	C1	C2	C3	C4	C5	C6	C7
Epacridaceae cont.							
Leucopogon lanceolatus var. *lanceolatus*		X	X		X	X	X
Leucopogon melaleucoides		X					
Melichrus procumbens	X	X	X		X	X	
Melichrus urceolatus			X		X		
Monotoca scoparia		X	X		X	X	
Trochocarpa laurina		X			X	X	X
Escalloniaceae							
Quintinia sieberi							X
Euphorbiaceae							
Acalypha nemorum	X						
Amperea xiphoclada var. *xiphoclada*		X	X			X	
Bertya sp.		X					
Breynia cernua (Poir.) Muell.Arg.	X						X
Phyllanthus gunnii	X					X	
Phyllanthus virgatus						X	
Poranthera microphylla	X	X			X	X	X
Eupomatiaceae							
Eupomatia laurina							X
Fabaceae							
Acacia diphylla	X				X		
Acacia falciformis		X				X	
Acacia filicifolia						X	
Acacia floribunda						X	
Acacia floydii		X			X	X	X
Acacia longifolia		X					
Acacia melanoxylon							X
Acacia orites					X	X	X
Acacia ulicifolia		X	X		X	X	
Acacia venulosa		X					
Bossiaea neo-anglica				X		X	
Bossiaea scortechinii	X		X		X	X	
Daviesia villifera			X			X	
Desmodium brachpodum	X						
Desmodium rhytidophyllum	X				X	X	X
Desmodium varians	X	X			X	X	X
Dillwynia phylicoides			X				
Glycine microphylla	X	X	X		X	X	X
Glycine tabacina	X				X	X	X
Gompholobium huegelii			X				
Gompholobium uncinatum			X				
Hardenbergia violacea		X			X	X	X
Hovea linearis	X		X		X	X	
Hovea sp. A		X					
Indigofera australis					X	X	X
Jacksonia scoparia	X	X			X	X	
Mirbelia pungens	X	X					
Mirbelia speciosa subsp. *speciosa*		X					
Podolobium ilicifolium (Andrews) Crisp	X	X	X		X	X	X
Pultenaea dentata						X	
Pultenaea foliolosa			X				
Pultenaea linophylla			X				
Pultenaea retusa						X	

	C1	C2	C3	C4	C5	C6	C7
Fabaceae cont.							
Pultenaea sp. aff. *obovata*		X					
Pultenaea villosa			X	X			
Vigna vexillata var. *angustifolia*	X						
Gentianaceae							
Centaurium erythraea						X	
Geraniaceae							
Geranium retrorsum						X	
Geranium solanderi var. *solanderi*		X		X	X	X	X
Pelargonium inodorum						X	
Goodeniaceae							
Dampiera stricta			X	X		X	
Goodenia bellidifolia subsp. *argentea*			X	X	X	X	X
Goodenia hederacea subsp. *hederacea*		X				X	X
Goodenia ovata							X
Goodenia rotundifolia	X						
Haloragaceae							
Gonocarpus micranthus subsp. *micranthus*			X	X			
Gonocarpus tetragynus		X	X	X	X	X	X
Gonocarpus teucrioides		X			X	X	X
Haloragis heterophylla	X					X	
Lamiaceae							
Ajuga australis	X				X		
Mentha diemenica	X						
Plectranthus graveolens	X						
Plectranthus parviflorus	X				X	X	X
Plectranthus suaveolens		X				X	X
Prostanthera nivea	X						
Prostanthera sp. 'Boonoo Boonoo'		X					
Lauraceae							
Cassytha pubescens			X				
Lobeliaceae							
Lobelia gibbosa						X	
Pratia purpurascens	X	X			X	X	X
Loranthaceae							
Amyema congener					X	X	X
Amyema pendulum			X		X	X	
Meliaceae							
Toona australis					X		
Monimiaceae							
Palmeria scandens							X
Wilkiea huegeliana							X
Moraceae							
Ficus rubiginosa	X						
Myrsinaceae							
Rapanea howittiana							X

	C1	C2	C3	C4	C5	C6	C7
Myrtaceae							
Angophora floribunda					X		
Baeckea omissa A.R.Bean			X	X			
Backhousia myrtifolia							X
Callistemon citrinus			X	X			
Callistemon pallidus				X			
Corymbia gummifera (Sol. ex. Gaertn.) K.D.Hill & L.A.S.Johnson	X				X	X	X
Eucalyptus amplifolia						X	
Eucalyptus andrewsii			X				
Eucalyptus brunnea							X
Eucalyptus cameronii			X		X	X	X
Eucalyptus campanulata		X	X		X	X	X
Eucalyptus dorrigoensis			X				
Eucalyptus dunnii							X
Eucalyptus fusiformis	X						
Eucalyptus oreades						X	
Eucalyptus propinqua	X						
Eucalyptus saligna							X
Eucalyptus scias subsp. *apoda*		X			X	X	X
Eucalyptus williamsiana			X			X	
Leptospermum arachnoides			X	X			
Leptospermum brevipes		X					
Leptospermum gregarium				X			
Leptospermum minutifolium			X	X			
Leptospermum novae-angliae		X	X				
Leptospermum polygalifolium subsp. *montanum*							X
Leptospermum polygalifolium subsp. *transmontanum*	X	X				X	
Leptospermum trinervium		X	X				
Lophostemon confertus	X	X			X		X
Syzigium luehmannii		X					X
Nyctaginaceae							
Boerhavia dominii	X						
Oleaceae							
Notelaea longifolia forma *intermedia*	X						
Notelaea sp. A		X			X	X	X
Onagraceae							
Epilobium billardierianum subsp. *cinereum*						X	
Oxalidaceae							
Oxalis chnoodes							X
Oxalis perennans	X					X	
Piperaceae							
Peperomia tetraphylla							X
Pittosporaceae							
Billardiera scandens var. *sericata*	X	X	X		X	X	X
Bursaria spinosa var. *macrophylla*							X
Bursaria spinosa var. *obovata*		X			X		X
Citriobatus pauciflorus							X
Hymenosporum flavum							X
Rhytidosporum procumbens			X			X	

	C1	C2	C3	C4	C5	C6	C7
Plantaginaceae							
Plantago varia						X	
Polygalaceae							
Comesperma ericinum						X	
Comesperma retusum			X				
Polygala japonica	X	X				X	
Portulacaceae							
Calandrinia pickeringii	X	X					
Proteaceae							
Banksia integrifolia subsp. A					X	X	X
Banksia spinulosa var. *collina*			X				
Hakea eriantha	X	X	X		X	X	X
Hakea florulenta			X				
Lomatia silaifolia		X			X	X	
Persoonia cornifolia						X	
Persoonia lanceolata			X				
Persoonia oleoides		X	X		X	X	X
Persoonia sericea	X	X	X		X	X	
Persoonia tenuifolia			X				
Petrophile canescens			X		X		
Ranunculaceae							
Clematis aristata						X	X
Ranunculus inundatus						X	
Ranunculus lappaceus		X				X	
Rhamnaceae							
Pomaderris elliptica	X						
Pomaderris lanigera			X				
Pomaderris notata		X					
Rosaceae							
Rubus moluccanus L. subsp. *moluccanus*							X
Rubus parvifolius						X	
Rubiaceae							
Canthium coprosmoides						X	X
Galium migrans					X	X	X
Galium propinquum							X
Opercularia hispida	X				X	X	
Pomax umbellata	X	X	X		X	X	X
Randia chartacea							X
Rutaceae							
Boronia algida			X				
Boronia parviflora				X			
Correa reflexa	X	X					
Phebalium squamulosum		X					
Philotheca myoporoides subsp. *epilosus* (Paul G.Wilson) M.J.Bayly		X					
Melicope hayesii						X	X
Santalaceae							
Choretrum candollei		X	X		X	X	
Exocarpus cupressiformis						X	
Scrophulariaceae							
Veronica calycina							X

	C1	C2	C3	C4	C5	C6	C7
Solanaceae							
Solanum campanulatum	X	X			X	X	X
Stackhousiaceae							
Stackhousia muricata		X		X			
Sterculiaceae							
Brachychiton populneus subsp. *populneus*	X						
Lasiopetalum ferrugineum var. *cordatum*	X						
Lasiopetalum ferrugineum var. *ferrugineum*			X				
Stylidiaceae							
Stylidium graminifolium			X		X	X	
Stylidium laricifolium		X					
Symplocaceae							
Symplocos thwaitesii							X
Thymelaeaceae							
Pimelea linifolia		X	X			X	
Tremandraceae							
Tetratheca thymifolia						X	
Ulmaceae							
Trema tomentosa var. *viridis*	X				X		
Urticaceae							
Elatostema reticulatum var. *reticulatum*	X						X
Verbenaceae							
Clerodendrum floribundum							X
Gmelina leichhardtii							X
Violaceae							
Hybanthus monopetalus	X		X		X		
Hybanthus stellarioides (Domin) P.I.Forst.	X				X		
Viola betonicifolia	X	X			X	X	X
Viola hederacea	X	X			X	X	X
Vitaceae							
Cayratia clematidea						X	
Cissus hypoglauca							X
Winteraceae							
Tasmannia insipida							X