The natural vegetation of the Burragorang 1:100 000 map sheet

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Abstract

Fisher, Mark[1], Ryan, Kate[1] and Lembit, Roger[2]. ([1]National Herbarium of New South Wales, Royal Botanic Gardens Sydney, New South Wales, Australia, 2000; [2]PO Box 294, Springwood, 2777) 1995. The natural vegetation of the Burragorang 1:100 000 map sheet. Cunninghamia *4(2): 143–215.* The composition and extent of the present natural vegetation of the Burragorang 1:100 000 map sheet 8929 (bounded by latitude 34°00′S 34°30′S, longitude 150°00′E 150°30′E) are mapped and described in terms of structure and characteristic species. The study area, south-west of Sydney and about 268 000 ha in area, includes the Burragorang valley, and much of the catchments of the lower Wollondilly, Wingecarribee, Nattai, Little, Kowmung and Tonalli Rivers, which drain into Lake Burragorang, the lake formed behind Warragamba Dam, and subsequently into the Hawkesbury–Nepean system. A range of landscapes is included, from tablelands and rugged mountain ranges to undulating lands, river valleys and deep gorges. Relevant Local Government areas are Mulwaree, Oberon, Wingecarribee and Wollondilly.

Thirty-one map units covering 44 plant communities are recognised and related to geology and physiography. Eucalypt woodlands and open-forests occur on soils on Ordovician, Silurian and Devonian metasediments and Permian and Triassic sandstones and shales. The north-eastern sandstone tablelands have a maritime climatic influence and the Sydney sandstone vegetation extends onto them from the north. In contrast, the south-western ranges are drier with woodlands similar to those of the western slopes. Floristic composition is influenced not only by the soils but also by altitude. The sandstone tablelands of the south-east rise gently into the Southern Highlands near Mittagong, with plant communities grading from those which contain warm-climate coastal species to those adapted to a cooler climate. Patches of mallee and montane heath occur on the shallowest, most skeletal soils. Taller forests are supported by the deeper volcanic loams.

The conservation reserve system includes three National Parks and three State Recreation Areas, which protect land mainly in the northern half of the map sheet. In the southern half of the map area the reserve system is much more limited and protection of the isolated remnants is inadequate. Land clearing and development of land for rural subdivisions remain as threats to native vegetation on private land. Native vegetation along the Lake Burragorang foreshores may be threatened by proposals to raise Warragamba Dam for flood mitigation or increasing water storage. Thirty-one species are listed as either rare, threatened or of botanical significance in terms of geographic distribution for the map area.

Introduction

This paper, part of the Sydney Region Vegetation Map Series, describes the vegetation of the Burragorang 1:100 000 map sheet, an area of about 268 000 ha, south-west of Sydney. The area includes the Burragorang valley, and much of the catchments of the lower Wollondilly, Wingecarribee and Nattai Rivers, and includes a range of landscapes, from tablelands and rugged mountain ranges to undulating lands, river valleys and deep gorges. The main river systems, the Wollondilly, Wingecarribee, Nattai, Little, Kowmung and Tonalli Rivers, drain into Lake Burragorang, the lake formed behind Warragamba Dam, and subsequently into the Hawkesbury–Nepean system.

Formerly a rural valley and tourist area, the Burragorang Valley, west of Camden, was flooded following the construction of Warragamba Dam in the 1950s and since then much of the area has been cut off from public access as part of the Water Board Catchment. The immediate catchment area, and the extremely rugged and inaccessible land to the north and west of it, constitute a large tract of wilderness that has generally escaped large-scale changes by European settlement — the valleys of the Tonalli and the Kowmung Rivers, the Burragorang, Nattai and Lacys Tablelands and the Boyd and Scotts Main Ranges. Here a complex of eucalypt woodlands and open-forests, with pockets of rainforest, heathlands, shrublands and wetlands, reflect the diverse geology and topography. In sharp contrast to the northern half of the map sheet area, much of the southern half, the Southern Highlands landscapes of Mittagong and Berrima, and the valley of the Wollondilly, have been cleared for agriculture owing to the fertility of the soil and the suitable undulating landscapes.

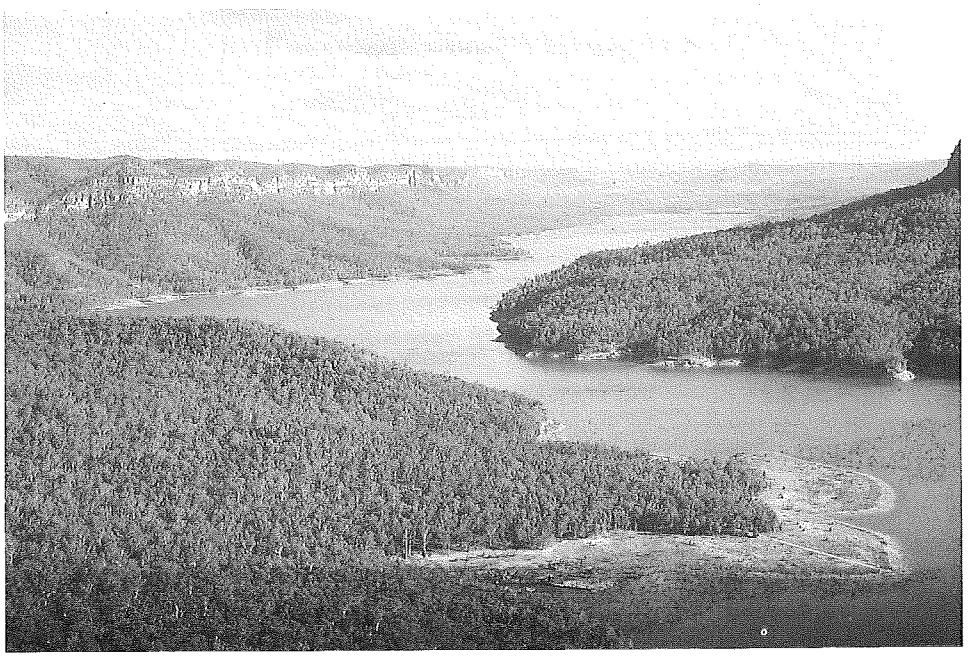

Figure 1. Lake Burragorang looking up Wollondilly arm, Wanganderry Walls on left

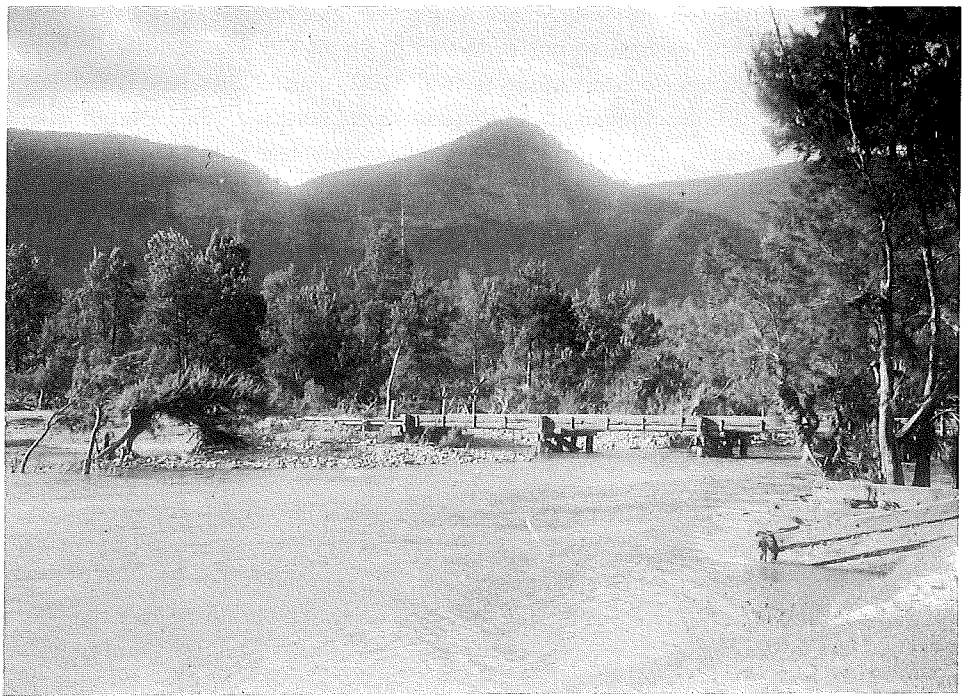

Figure 2. The Wollondilly River with its banks of *Casuarina cunninghamiana* in 1952 before flooding by Lake Burragorang.

Here pockets of native vegetation are scattered across the cultivated and grazed rural lands of a landscape often purported as 'English' with its improved green pastures and windbreaks and plantings of exotic trees.

Geography

The Burragorang 1:100 000 vegetation sheet (based on the Australian 1:100 000 Topographic Survey sheet Burragorang 8929 AUSLIG, Canberra) covers the 1:25 000 Topographic Survey sheets Burragorang, Nattai, Hilltop, Mittagong, Hanworth, Barrallier, Bindook and Yerranderie. The Burragorang sheet is bounded by latitudes 34°00'S and 34°30'S and longitudes 150°30'E and 150°00'. The eastern boundary of the study area runs east of Oakdale, Hilltop and Mittagong and west of Camden; the western boundary, east of Wombeyan Caves and the Great Dividing Range; the northern boundary cuts across Lake Burragorang and Boyd Plateau and the southern boundary runs south of Bowral and Mittagong. Relevant Local Government areas are Mulwaree, Oberon, Wingecarribee and Wollondilly. The area falls within the Counties of Camden, Westmoreland and, to a lesser extent, Argyle.

The Burragorang area is part of the Eastern Botanical Division of New South Wales and includes the two Botanical Subdivisions, Central Coast and Central Tablelands. Many of the plant communities identified in the study area extend beyond the map boundaries into surrounding map sheets, Katoomba, Wollongong, Moss Vale and Taralga 1:100 000 sheets.

The largest towns in the study area are Mittagong and Bowral in the Southern Highlands in the south-eastern corner of the map. Smaller towns include Berrima, Hilltop, Colo Vale, Aylmerton and Medway in the south, and Nattai and Oakdale in the north. In the south, Wombeyan Caves Road links the west with the east; but in the north, Lake Burragorang cuts off public access between east and west. A Sydney Water road runs along part of the lake from the Nattai River to the southwest. Yerranderie, a former silver-mining town on the western side of Lake Burragorang, is accessible via Oberon or Taralga. Approximately one-third of the study area, which includes all the land bordering the water storage of Lake Burragorang, lies within the Sydney Water Catchment Area. The land west of the lake is part of Blue Mountains or Kanangra–Boyd National Parks. Nattai Tablelands, south of the lake, are part of Nattai National Park. There are also three State Recreation Areas: Burragorang; Yerranderie; and Bargo. The southern half of the map is largely freehold. An account of the early history and development of the Wollondilly area is given in Craft (1932).

Dominant physiographic features in the Burragorang area include: Lake Burragorang, an artificially drowned river valley; East and West Nattai Walls, the sheer escarpment faces marking the edges of the Wanganderry, Burragorang, Tonalli and Nattai Tablelands; the Wollondilly River Valley, which is an incised winding trench 600 m deep in parts, meandering its way from the south up to feed Lake Burragorang; the deeply disected landscape of the Kowmung Valley, a rugged wilderness; and the Boyd Plateau, a granite tableland rising above the surrounding dissected Kowmung Valley, its rocks having withstood erosive processes better than the surrounding valleys' sedimentary rocks. An interesting account of the physiography of the Wollondilly River basin is given in Craft (1928a) and the Cox–Wollondilly area in Craft (1928b).

Geology and geomorphology

The extensive Triassic sandstone plateau, characteristic of the Sydney Basin, dominates the eastern half of the study area (NSW Dept of Mines 1966). It consists of Hawkesbury and Narrabeen Group sandstones and rises from an altitude of 500 m in the north, near Oakdale, to approximately 750 m in the south, just north of Mittagong. The sandstone strata remain largely horizontal, and have been dissected by the Nattai and Little Rivers and the Wollondilly River (before its valley was dammed and flooded to form Lake Burragorang). These river systems have incised the sandstone plateau to form a series of sandstone-topped tablelands, the Wanganderry, Nattai, Burragorang and Tonalli Tablelands (Figure 4).

Several rock types may overlie the Triassic sandstone. Where the Triassic sandstone plateau is broad and high, as in the Southern Highlands, Triassic Wianamatta Group shale caps persist. Mittagong, Aylmerton, Mandemar Flats and Soapy Flats are on shale cappings. Other rock types overlying the Triassic sandstone include Tertiary igneous outcrops in the south around Mittagong, such as Mount Jellore, Mount Flora, Mount Gibraltar and Mount Misery, which are trachyte peaks; and in the north, near Yerranderie, are the basalt caps of Mount Shivering and Mount Colong.

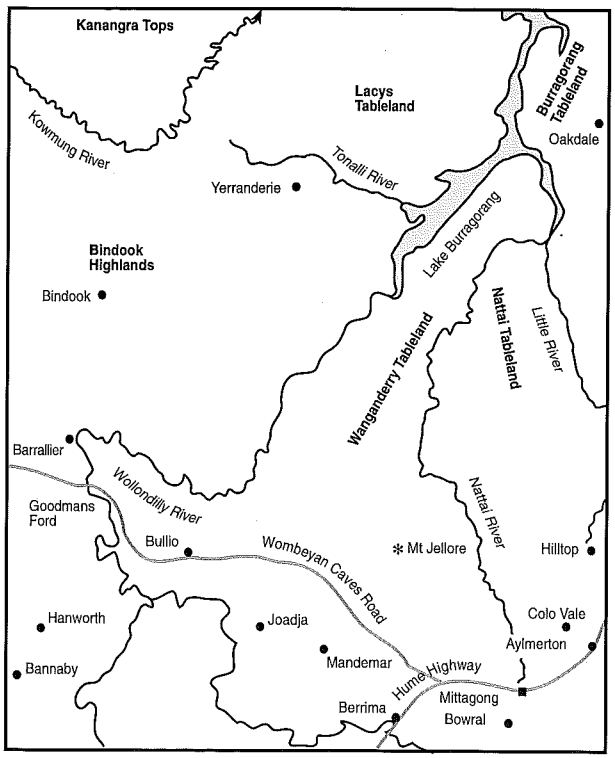

Figure 3. Major localities for the Burragorang 1:100 000 map sheet.

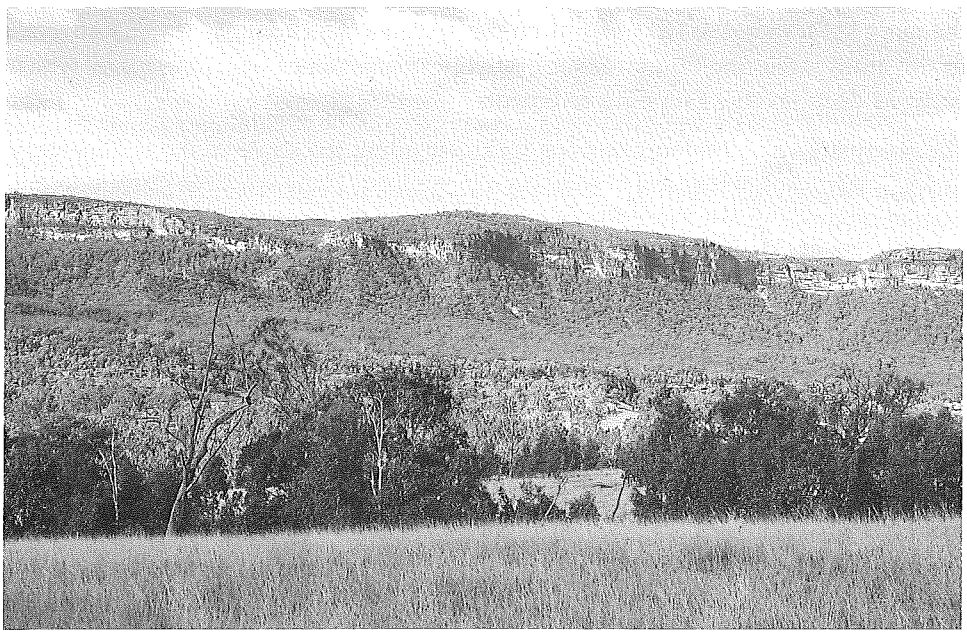

Figure 4. The sandstone cliffs of the Wanganderry Walls with the Douglas Scarp in foreground.

Underlying the Triassic sandstone strata, having been exposed in the downcutting processes of streams, the Permian Illawarra Coal Measures form a narrow band below the cliff line and include shales, sandstones, conglomerates and chert with coal and torbanite seams (New South Wales Department of Mines, 1966). The rapid weathering of these softer rocks undercuts the more resistant Triassic sandstones above, leading to the collapse along joint lines and the formation of spectacular cliffs, for example East and West Nattai Walls. While most of the Illawarra Coal Measures are restricted to a narrow band below clifflines, a number of exposed residual cappings also occur in the north-west of the study area atop Shoalhaven Group sandstones. Examples of this include Mootik Plateau and Tonalli Mountain.

At the base of the escarpment, below the Illawarra Coal Measures, streams have downcut further into the rock profile to expose Permian Shoalhaven Group sandstones and sediments. Foreshores of Lake Burragorang and the valley floors of the Nattai and Little Rivers are made up of siltstones, shales and sandstones of the Shoalhaven Group. The Bindook Highlands, west of Lake Burragorang, are a residual capping of Shoalhaven Group sediments.

To the west and south of the Triassic sandstone strata are the older Devonian and Silurian strata which have complex faults and folds throughout. The Devonian Lambie Group, which underlies the Permian Shoalhaven Group sandstones, outcrops to occupy a large area in the Kowmung Valley and the Boyd Range. These are composed of quartzites, sandstones, siltstones and shales and have been sculptured by the Kowmung River into a very rugged country. The deep valleys of the Kowmung are steep-sided and are separated by flat-topped ridges. Peaks include Arabanoo Peak (797 m), Mount Savage (937 m), Mount Colboyd (1004 m) and Mount Pindari (1080 m). Kowmung Valley floors are about 350–400 m a.s.l. In the north-west corner of the map, separating the Devonian from the Permian sandstone, lie the oldest rocks in the study area, the Silurian slates, phyllites, sandstones and limestones which occur as deep layers of dipping sediments.

The study area also contains igneous rocks intruding the strata of the sedimentary rocks. Tertiary volcanics have already been mentioned. There is a large Carboniferous granite outcrop on the Boyd Plateau in the far north-western corner of the study area that stands above the rugged surrounding sedimentary landscape as a massive, solid raised plateau. The rock type has given rise to a plateau with a more even topography, with low relief and open valleys.

Most of the western half of the study area is composed of porphyries and acid pyroclastics of the Bindook Porphyry Complex, an extensive, heavily-weathered volcanic complex of Devonian age. It mostly forms an undulating landscape, as in the rolling hills of Bannaby and Hanworth, with moderately steep ranges such as Joorilands Range in the north. A more rugged and inaccessible porphyry landscape occurs west of Bullio, where peaks and ridges are between 500 m and 800 m, as at Bullio Hill, Perpendicular Rock and Round Hill, and valleys at 300 m, as at Goodmans Ford.

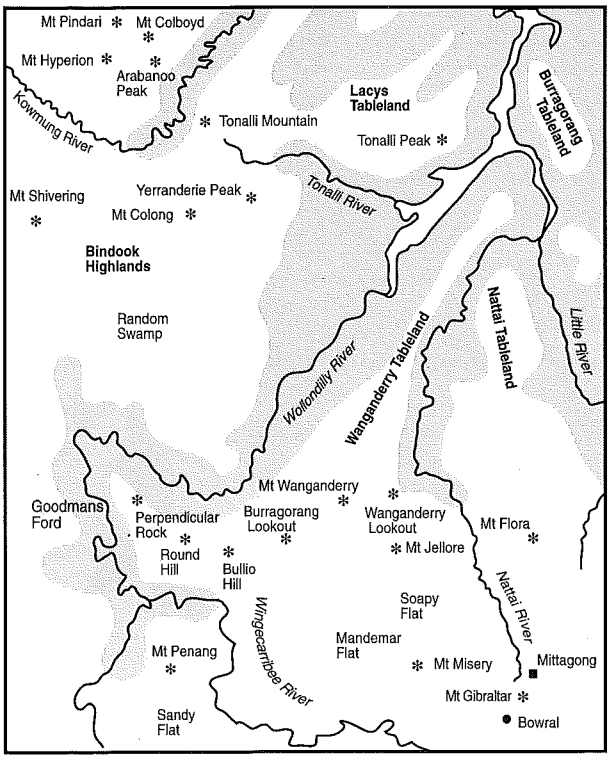

Figure 5. Topography of the Burragorang 1:100 000 map sheet showing country below 600 m (shaded) and above (unshaded).

Soils

Soils of the Burragorang 1:100 000 map sheet largely reflect geology (Hamilton 1976). Soils derived from Triassic Sandstones are sandy, yellow, leached, gradational soils with ironstone gravel. They are rapidly permeable, very acid and infertile and are common on low-relief, flatter parts of the sandstone tablelands. Where relief is higher, as at Mt Nattai, grey-brown and yellow-brown uniform sands develop.

Where remnant cappings of Wianamatta Shale occur on the sandstone tablelands, hardsetting loamy red and yellow texture contrast soils (with ironstone gravel) occur. These soils are moderately to slowly permeable, very acid and relatively infertile. On the true shale country further south, near Mittagong, clay loam red gradational soils have developed.

Tertiary igneous outcrops in the south-eastern portion of the study area, such as Mount Jellore and Mount Flora, support clay loam brown and red structured friable soils. These are moderately to slowly permeable, slightly acid to neutral with high fertility.

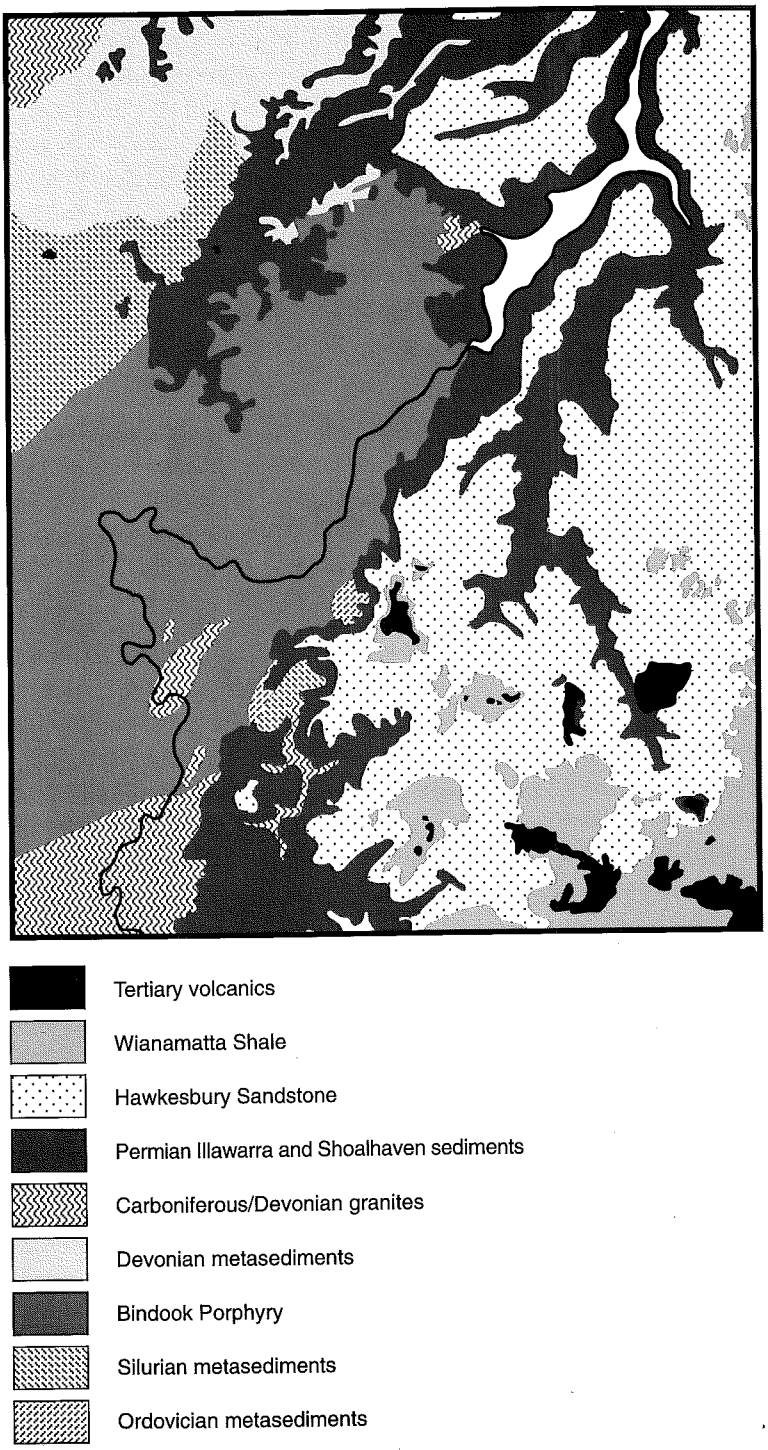

Figure 6. Geology of the Burragorang 1:100 000 map sheet (based on NSW Department of Mines 1966)

Where streams have incised the Triassic sandstone tablelands to expose valleys of Permian Shoalhaven Group sandstones, hardsetting sandy loam yellow texture contrast soils have developed. These are relatively infertile soils, acid and moderately to slowly permeable. They are widespread in the study area, occurring on flats and slopes between the larger streams and the escarpment walls. They also occur further west on Bindook Highlands.

In the north-west, soils derived from Silurian and Devonian substrates are loamy yellow leached gradational soils, moderately to slowly permeable, acid and low in fertility. These are adjacent to the sandy loam red-brown gradational soils derived from Carboniferous granite of the Boyd Plateau. These are deep, rapidly permeable in the upper horizons, acid and are low to moderate in fertility.

The Devonian Bindook porphyry, occurring widely in the western half of the study area supports hardsetting, loamy, red, texture-contrast soils. Where the landscape is more undulating, areas have been extensively cleared owing to the relatively fertile nature of the soil and its suitability for agriculture; on steeper slopes the vegetation has been left uncleared.

Climate

Altitude, topography and the degree of maritime influence account for substantial regional climatic variation. Six broad climatic regions can be recognised in the area (Figure 7):

1. the high-altitude (1100–1200 m a.s.l.) plateau and ranges of Boyd Plateau and Kanangra Tops in the north-west;
2. the north-east sandstone tablelands (500–600 m a.s.l.), represented by the climatic data of Camden;
3. the Bindook highlands in the north-west (800–880 m a.s.l.), Yerranderie (600 m a.s.l.) and the Kowmung Valley (400–900 m a.s.l.) represented by the climatic data of Yerranderie;
4. the low-lying valleys (140–180 m a.s.l.) of the Wollondilly, Little and Nattai Rivers;
5. the Southern Highlands (600–700 m a.s.l.) represented by the climatic data of Mittagong;
6. the drier country of the south-west (670–770 m a.s.l.) mainly to the west of the Wollondilly River, represented by the climatic data of Hanworth (Bureau of Meteorology 1979).

Altitude exerts a strong influence on temperature across the study area. The broad low-lying valleys around Lake Burragorang (region D) are generally warmer (average annual minimum–maximum temperature, 9–23°C) than the higher elevation Bindook Highlands and Yerranderie (region C, 7–21°C), the Southern Highlands (region E, 7–19°C) and the high-altitude Boyd Plateau (region A, 7–18°C). A temperature gradient

related to altitude is also evident from Camden in the north (region B) which has a mean summer maximum of 29°C and a mean winter minimum of 3°C, decreasing with elevation to Mittagong (region E) which has a mean summer maximum of 25°C and a mean winter minimum of 2.5°C.

Lying wholly on the eastern side of the coastal ranges and, in common with the rest of north-eastern New South Wales, the study area receives the greatest amount of rainfall in the hottest part of the year (Table 1). The dry porphyry country in the south-west (region F), however, has a more even spread of lower rainfall. A rainshadow effect is most pronounced in the Bindook Highlands and Yerranderie (region C), which lie behind the south-western margin of the Blue Mountains. The Boyd Plateau (region A) (1000 m elevation), the most elevated area, receives the highest rainfall (1100 mm p.a.). In the southern half of the map (regions E and F), variation in rainfall is primarily a function of the declining maritime influence from east to west: rainfall decreases steadily from 900 mm p.a. in the east near Mittagong in the Southern Highlands to 680 mm p.a. in the west near Hanworth. The south-western corner of the map area (the dry porphyry country of Hanworth and the Wollondilly Valley, region F) receives the least rainfall (679 mm p.a.).

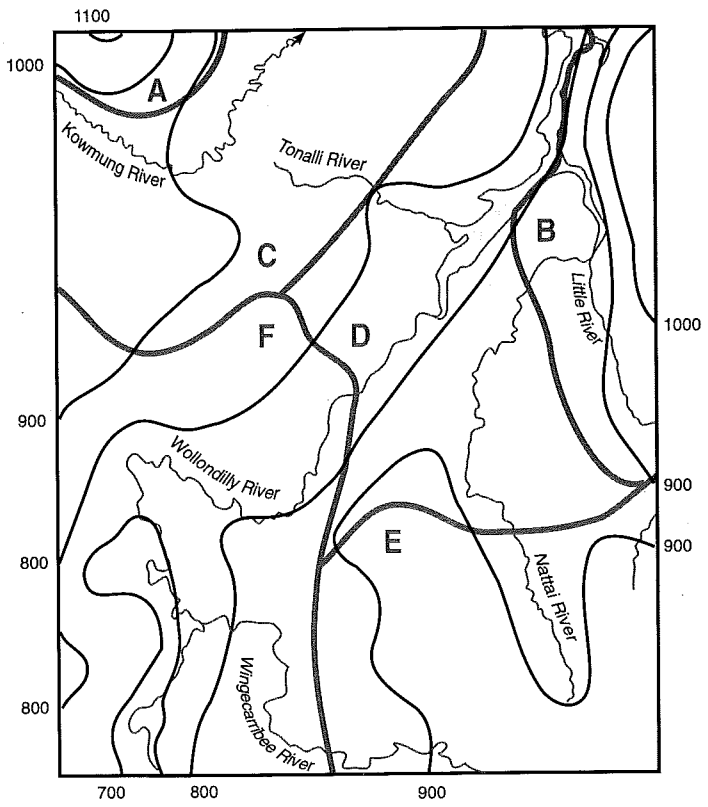

Figure 7. Rainfall isohyets (mm) and climatic regions on the Burragorang 1:100 000 map sheet A) high-altitude Boyd Plateau and Kanangra Tops, B) North-east sandstone tablelands, C) Bindook highlands and Kowmung valley, D) Lowlying valley of the Wollondilly, Nattai & Little River, E) Southern Highlands and F) the drier country of the south-west.

Table 1. Average monthly and annual rainfall (mm) for four climatic regions of Burragorang 1:100 000 map. (Source: Bureau of Meteorology, 1979.)

Location	Latitude / Longitude	Years of Record	J	F	M	A	M	J	J	A	S	O	N	D	Year
Camden	34°04'S 150°42'E	87	85	77	81	67	58	68	57	44	39	51	67	73	764
Yerranderie	34°07'S 150°12'E	32	105	96	91	66	70	78	56	32	45	51	64	90	844
Mittagong	34°24'S 150°29'E	63	91	82	83	76	76	84	77	54	54	68	64	84	893

Table 2. Sources of data used in preparation and completion of Burragorang 1:100 000 vegetation sheet

Source	Year	Information	Scale
NSW Dept of Lands	1972	Aerial photomosaics	1:50 000
NSW Dept of Lands	1972,1982	Black & white aerial photos	1:50 000
Australian Centre for Remote Sensing	March, 1992	LANDSAT TM satellite imagery	1:100 000
NSW Dept of Mines	1966	Wollongong Geology sheet	1:250 000
Central Mapping Authority of NSW	1982-1984	Topographic maps	1:25 000 1:100 000
Soil Conservation Service of NSW	1985	Soil map	1:100 000

Methods

The vegetation survey and map production is based on information from earlier surveys together with aerial photography, satellite imagery, field checking and site-based data collection. Early vegetation surveys include Cambage (1911), who made notes on the native vegetation from Camden to Burragorang and Mt Werong and Ilma Pidgeon's general vegetation survey of Central Coastal NSW (Pidgeon 1937, 1938, 1940, 1941). Surveys of specific areas include the native vegetation of Mount Jellore (Benson 1979); the vegetation of the Boyd Plateau (Black 1982); and the vegetation of the Kanangra–Boyd National Park (Steenbeeke 1990). The southern half of the sheet is based on a provisional vegetation map (Benson 1984) incorporating work by other Royal Botanic Gardens staff Martin Cooper and Stephen Powrie, including vegetation surveys for the construction of Freeway No. 5 (Cooper, Powrie & Benson 1983). Roger Lembit's contribution draws upon his extensive field knowledge of the area gained over the past 15 years.

Recent reconnaissance fieldwork was carried out in 1993–4 to identify broad vegetation patterns and their relation to geology and topography. This allowed preparation for air-photo interpretation, wherein areas of vegetation with similar structure (as defined by Specht 1970) and floristics (dominant species), were grouped to form map units on the basis of photo-patterns from air photos and recognisable geological and landscape characteristics. Black and white 1:50 000 aerial photographs (1982) and LANDSAT™ imagery (1:100 000, 1991) were used in combination with topographical, geological and soil maps to determine plant community boundaries. Particular criteria adopted in air photo interpretation included tree height, crown shape, size, density and cover. Sources of information used in the compilation of maps are listed in Table 2.

Sampling sites were selected within each of the recognised plant communities and then marked onto the air photos and topographic maps in preparation for field work. Field work was carried out between April and December, 1993 sites were sampled and community boundaries checked and confirmed. Rugged topography and restricted access confined sampling to sites along roads and firetrails. Quadrats conformed to the standard Royal Botanic Gardens site-sampling, including a 20 m x 20 m quadrat, a list of all vascular plant species present within the sampling area, percentage cover of each species, the number and height of each strata, soil type, landform, geology and disturbance factors for every site. Data from the quadrats was included in the community descriptions and species list.

On the final vegetation map, an alphanumeric code is used to distinguish individual plant communities. The numeric code represents the structural form of the plant community and the alphabetic code refers to either the dominant species of the tallest stratum or the geological type which supports the community. Map units have also been provided with common names based loosely on habitat and composition, for ease of reference. The codes used are consistent throughout the

Sydney Region 1:100 000 Vegetation Map Series, allowing map units to be cross-referenced (e.g. with Keith & Benson 1988). Provisional vegetation maps were drafted at the 1:25 000 scale and reduced to 1:100 000 scale.

The vegetation map is a diagrammatic attempt to simplify the distribution patterns of an often rich and varied flora, over an extensive region. The scale of the mapping and time constraints allow detailed treatment of the dominant canopy and understorey species only. It is scale-dependent and map units will almost invariably include unmapped areas of other map units too small to be shown separately. Similarly, most plant communities do not have clear-cut boundaries but grade into each other, often over a broad ecotone. For mapping purposes such boundaries have to be represented by a line.

There are a number of constraints in reducing the complex pattern of natural vegetation to a map format. The map units recognised are not all of equivalent rank. Some are essentially land units made up of several plant communities associated with a particular geological or physiographic type (e.g. map units 10ar and 10ag, 6hd and 6h m, 10q) whereas others are more clearly individual plant associations (*sensu* Beadle & Costin, 1952) (eg. map units 6g and 10mr). Generally the term 'plant community' is used for the component associations of the vegetation map unit.

Species lists for plant communities (Appendix A) were compiled from our fieldwork and quadrats as well as from the surveys of Steenbeeke (1990), Benson (1979) and Benson (1984). Lists of rare and endangered species were compiled from the national ROTAP listing maintained by the NSW National Parks and Wildlife Service together with reference to specimens at the National Herbarium of New South Wales. Botanical names used are those currently recognised at the National Herbarium of New South Wales. For authorities see Harden (1990–93).

Vegetation

Description of map units

Thirty-one map units have been recognised on the Burragorang 1:100 000 map sheet, with 44 plant communities. Cleared areas have also been recognised. Approximately one-sixth of the map-sheet has been cleared. Early settlement and clearing in the map area were concentrated in the south-east corner where the clay soils derived from the shales were more suitable for agriculture. The lower parts of the Burragorang valley were cleared and grazed but the upper slopes remained largely undisturbed until subsequently flooded to form Lake Burragorang.

The structural formation, main canopy species, geology, altitude and distribution for each plant community are shown in Table 3 and depicted in the 1:100 000 vegetation map accompanying this text. A description of each plant community follows. A list of native species is given in Appendix A.

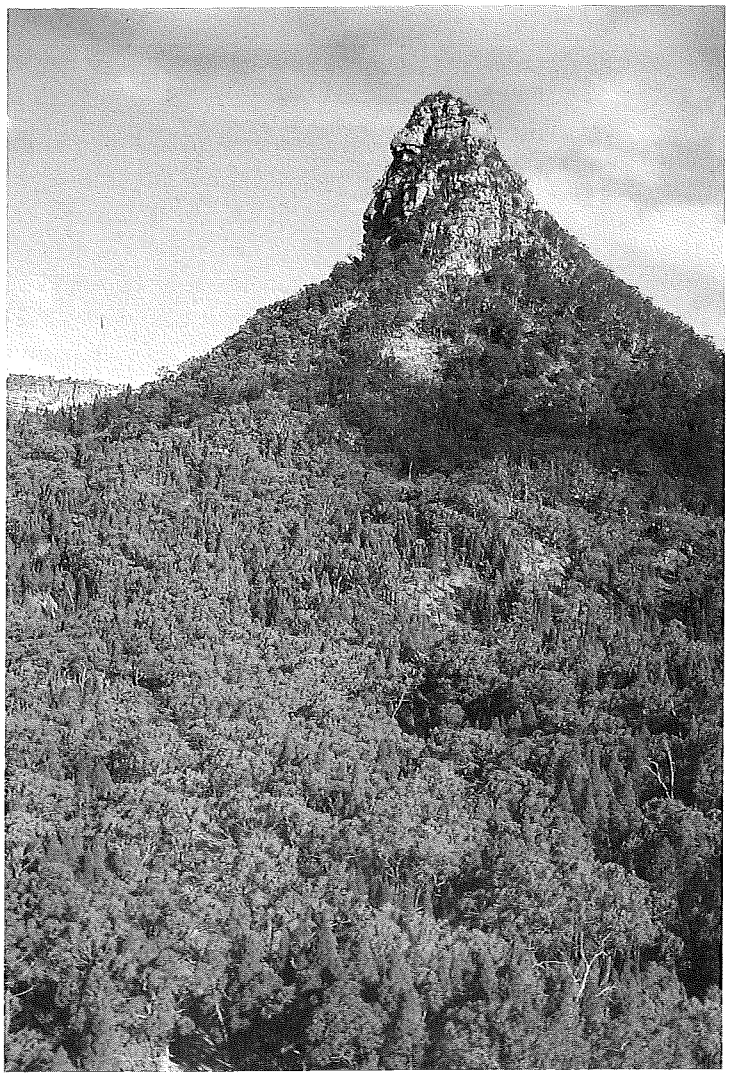

Figure 8. The sandstone-topped Yerranderie Peak with *Callitris endlicheri* on the lower slopes.

Table 3. Map unit, common name, structure, main canopy species, geology, altitude and location of plant communities in the area covered by the Burragorang 1:100 000 map sheet

MAP UNIT	STRUCTURE	MAIN CANOPY SPECIES	GEOLOGY	ALTITUDE	OCCURRENCE
6g	**Moist Basalt Cap Forest**				
	Tall open-forest	*Eucalyptus viminalis* *Eucalyptus fastigata*	Tertiary Basalt caps	>800 m	Mount Colong Mount Shivering
6hd	**Dry Escarpment Forest Complex**				
	Open-forest	*Eucalyptus piperita* *Angophora costata*	Illawarra & Shoalhaven Group sediments	300–500 m	N–NW escarpment faces: (gullies & sheltered slopes)
	Open-forest	*Eucalyptus punctata* *Eucalyptus fibrosa* *Angophora floribunda*			Drier spurs
6hm	**Moist Escarpment Forest Complex**				
	Tall open-forest	*Eucalyptus deanei* *Syncarpia glomulifera* *Eucalyptus hypostomatica* *Eucalyptus agglomerata*	Illawarra & Shoalhaven Group sediments	300–500 m	S–SE escarpment faces: (gullies & sheltered slopes)
	Open-forest	*Eucalyptus crebra* *Eucalyptus punctata.* *Eucalyptus eugenioides* *Eucalyptus piperita*			Drier, more exposed spurs, foothills
6k	**Robertson Basalt Tall Forest**				
	Tall open-forest/ open-forest	*Eucalyptus fastigata* *Eucalyptus viminalis* *Eucalyptus elata*	Robertson basalt	650–700 m	Remnants near Mittagong, Bowral

d	**Kowmung Dry Rainforest**				
	Closed-forest	*Toona ciliata* *Dendrocnide excelsa* *Alectryon subcinereus*	Devonian metasediments	300–700 m	Deep, narrow, sheltered gullies of Kowmung Valley
9i	**Blue Mountains Sandstone**				
	Plateau Forest				
	Open-forest	*Eucalyptus sieberi* *Eucalyptus piperita*	Triassic and Permian sediments	800–1150 m	Dissected sandstone plateaus
9n	**Montane Moist Forest**				
	Open-forest	*Eucalyptus fastigata* *Eucalyptus dalrympleana* subsp. *dalrympleana* *Eucalyptus viminalis*	Lambie Group Carboniferous granite	>700 m	Steep slopes & moist sheltered gullies
9to	**Taralga Ordovician Forest**				
	Open-forest	*Eucalyptus agglomerata* *Eucalyptus macrorhyncha* *Eucalyptus punctata* *Eucalyptus sieberi*	Ordovician sediments	650–800 m	Dissected Ordovician sediments west of Barrallier and Bindook Highlands
9w	**Wingecarribee Forest**				
	Open-forest	*Eucalyptus sieberi* *Eucalyptus punctata* *Eucalyptus eugenioides* *Eucalyptus mannifera*	Permian Illawarra Coal Measures	500–750 m	Upper slopes of Wingecarribee valley, Joadja plateau and Sandy Flat
9x	**River Oak Forest**				
	Open-forest	*Casuarina cunninghamiana* subsp. *cunninghamiana*	Quaternary alluvium	<400 m	Wollondilly, Nattai, Kowmung and Little Rivers

9y	**Mount Gibraltar Forest**				
	Open-forest	*Eucalyptus piperita* *Eucalyptus radiata* subsp. *radiata* *Eucalyptus smithii*	Volcanic outcrops	>700 m	Mount Gibraltar, Mount Misery, Cockatoo Hill
	Low woodland	*Eucalyptus blaxlandii* *Allocasuarina verticillata*	Trachyte	700 m	Mount Jellore
10ag	**Sydney Sandstone Gully Forest**				
	Open-forest	*Eucalyptus piperita* *Eucalyptus agglomerata* *Angophora costata*	Triassic Hawkesbury and Narrabeen Group Sandstone	<700 m	Sheltered slopes & gullies on plateaus
10ar	**Sydney Sandstone Ridgetop Woodland**				
	Woodland	*Eucalyptus sieberi* *Eucalyptus sclerophylla* *Eucalyptus piperita* *Eucalyptus gummifera*	Triassic Hawkesbury and Narrabeen Group Sandstone	<700 m	Exposed slopes & ridges on plateaus
10bh	**Bindook Highlands Woodland**				
	Woodland	*Eucalyptus sieberi* *Eucalyptus sparsifolia*	Shoalhaven Group sediments	800–900 m	Bindook Highlands, ridges, exposed slopes with shallow soils
	Woodland	*Eucalyptus sieberi* *Eucalyptus eugenioides*			Ridges, exposed slopes with deeper soils
	Woodland	*Eucalyptus radiata* subsp. *radiata* *Eucalyptus cypellocarpa* *Eucalyptus fastigata*			Cold, sheltered slopes with deeper soils

10dw	**Douglas Scarp Woodland**				
	Woodland	*Eucalyptus crebra* *Callitris endlicheri* *Acacia binervia*	Shoalhaven Group sediments	140–200 m	Exposed escarpment edge
10l	**Snow Gum Woodland**				
	Woodland	*Eucalyptus pauciflora* *Eucalyptus dalrympleana* subsp. *dalrympleana*	Devonian Kanangra Granite & Loombah quartzite	>1000 m	Loombah & Boyd Plateaus
10mr	**Montane Ridge Woodland**				
	Woodland	*Eucalyptus sieberi* *Eucalyptus radiata* subsp. *radiata* *Eucalyptus dives* *Eucalyptus mannifera*	Ordovician and Silurian sediments	850–1200 m	Ridges and exposed slopes east of the Great Dividing Range Fire Trail
10p	**Kowmung Wilderness Complex**				
	Woodland	*Eucalyptus punctata* *Eucalyptus agglomerata*	Devonian & Silurian sediments	300–1000 m	Ridges & drier aspects, Kowmung valley
	Tall open-forest	*Eucalyptus cypellocarpa* *Eucalyptus viminalis* *Angophora floribunda*			Gullies & sheltered aspects, Kowmung area
10pw	**Porphyry Box Woodland**				
	Woodland	*Eucalyptus tereticornis* *Eucalyptus melliodora* *Eucalyptus moluccana* *Eucalyptus albens*	Bindook Porphyry complex	200–800 m	Valleys & ridges of the dissected country

10q	**Burragorang Ironbark Woodland**				
	Woodland	*Eucalyptus crebra* *Eucalyptus punctata* *Eucalyptus eugenioides*	Shoalhaven Group sediments	300–570 m	Lake foreshores, below escarpment slopes & undulating hills, west of Lake Burragorang
	Woodland	*Eucalyptus sclerophylla* *Angophora bakeri*			Junction of Nattai River and Lake Burragorang
	Low closed-forest	*Backhousia myrtifolia*			Sheltered sites
10r	**Residual Sandstone Woodland**				
	Woodland	*Eucalyptus sieberi* *Eucalyptus blaxlandii*	Shoalhaven Group sediments	800–1000 m	Bindook Highlands
10s	**Montane Woodland**				
	Woodland	*Eucalyptus radiata* subsp. *radiata* *Eucalyptus dalrympleana* subsp. *dalrympleana*	Carboniferous Granite & Lambie Group sediments	>900 m	High-altitude undulating country
10w	**Joadja Stringybark Woodland**				
	Woodland	*Eucalyptus agglomerata* *Eucalyptus eugenioides*	Shoalhaven Group sediments	600–700 m	Slopes of Wingecarribee Valley
	Open-forest	*Eucalyptus elata*		500–550 m	River-flats
10x	**Southern Highlands Shale Woodlands**				
	Woodland	*Eucalyptus cypellocarpa* *Eucalyptus quadrangulata* *Eucalyptus globoidea*	Wianamatta Shale	600–700 m	Remnants on shale caps south from Aylmerton
	Woodland	*Eucalyptus ovata* *Eucalyptus amplifolia* subsp. *amplifolia*			Poorly-drained sites
	Woodland	*Eucalyptus cinerea* *Eucalyptus globoidea*			Mandemar area

10z	**Mittagong Sandstone Woodland**				
	Woodland	*Eucalyptus sieberi* Eucalyptus piperita Eucalyptus sclerophylla	Triassic Hawkesbury Sandstone	700–800 m	High-altitude sandstone table and around Mittagong
	Open-forest	*Eucalyptus smithii* *Eucalyptus cypellocarpa* *Eucalyptus elata*		>500 m	Gullies at head of Nattai River
15z	**Wingecarribee Mallee**				
	Low open-woodland	*Eucalyptus apiculata*	Triassic Hawkesbury Sandstone	600–650 m	Restricted to exposed bedrock around Wingecarribee River
17a	**Teatree Scrub**				
	Open-scrub	*Leptospermum polygalifolium* *Eucalyptus mannifera*	Shoalhaven Group sediments	830 m	Random Swamp & Tomat Heights on Bindook Highlands
17m	**Range Mallee**				
	Open-scrub	*Eucalyptus stricta* *Eucalyptus pauciflora*	Silurian Group sediments soils	1160 m	Loombah Plateau, ridges with skeletal
21c	**Montane Heath**				
	Open-heath	*Eucalyptus stricta* *Allocasuarina nana* *Hakea dactyloides* *Leptospermum trinervium*	Permian & Triassic sediments	>1000 m	Boyd Plateau
	Open-heath	*Dracophyllum secundum* *Epacris calvertiana* *Gleichenia rupestris*			Moist cliff-faces
26b	**Boyd Plateau Bogs**				
	Closed-sedgeland/ closed-heath/ open-heath	*Carex appressa* *Carex gaudichaudiana* *Restio australis*	Granite & quartzite	>1100m	Depressions in Boyd Plateau
C	**Cleared**				

Plant community descriptions

Map unit 6g
Moist basalt cap forest

Tall open-forest: *Eucalyptus viminalis – Eucalyptus fastigata*

The fertile clay-loams derived from the basalt caps of Mounts Colong (1047 m) and Shivering (1121 m) support a tall open-forest of *Eucalyptus viminalis* and *Eucalyptus fastigata.* Shrubs common in the understorey include *Acacia melanoxylon, Polyscias sambucifolia* and *Leucopogon lanceolatus. Lomandra longifolia* is the most common ground species, forming large scattered clumps. Other ground-cover species include *Geranium solanderi, Acaena novae–zelandiae, Galium gaudichaudii, Pratia purpurascens, Oplismenus aemulus, Dichondra repens, Stellaria flaccida* and *Stellaria pungens.* Common ferns include *Polystichum proliferum, Pteridium esculentum, Blechnum cartilagineum* and *Doodia aspera.*

Similar vegetation occurs further north on basalt caps in the Blue Mountains at Mt Wilson and Mt Tomah (Keith & Benson 1988) and west at Mt Werong (Fisher & Ryan 1994).

Map unit 6hd
Dry Escarpment Forest Complex

The Dry and the Moist Escarpment Forest Complexes (map units 6hd and 6hm) are the southern continuation of the Escarpment Complex (map unit 6h of Keith & Benson 1988) along the western edge of the Triassic sandstone of the Blue Mountains. Dry Escarpment forest is an open-forest community on moderate to steep, N to NW facing slopes of the Permian Illawarra and Shoalhaven sediments that outcrop immediately below the Triassic sandstone escarpment. These slopes are drier and more exposed than their southern-facing counterparts. Soils are sandy and dry. Two sub-units can be recognised.

i) Open-forest: *Eucalyptus piperita – Angophora costata*

Gullies and their sheltered slopes are dominated by open-forest with *Eucalyptus piperita* and *Angophora costata. Eucalyptus tereticornis* and *Angophora floribunda* occur occasionally. Floristically, this resembles the Hawkesbury Sandstone Complex (map units 10ag/10ar). Common understorey species include *Banksia spinulosa* var. *spinulosa, Banksia serrata, Lambertia formosa, Persoonia linearis, Dillwynia retorta* and *Oxylobium ilicifolium.*

ii) Open-forest: *Eucalyptus punctata – Eucalyptus fibrosa – Angophora floribunda*

Open-forest with *Eucalyptus punctata, Angophora floribunda, Eucalyptus fibrosa* and *Acacia falciformis* occurs on drier spurs. *Eucalyptus agglomerata* occurs occasionally.

Map unit 6hm
Moist Escarpment Forest Complex

Forests of the Moist Escarpment Complex occur on moderate to steep, south to south-east facing slopes below the Triassic Sandstone escarpment. They are supported by relatively deep, moist, well-drained, sandy, loams, with colluvial material from shales, sandstones and conglomerates. The soils are derived from the Permian Illawarra Coal Measures and, to a lesser extent, Shoalhaven Sandstones.

There are two sub-units within this community, floristics changing between the gullies and the spurs.

i) Tall open-forest: *Eucalyptus deanei – Syncarpia glomulifera – Eucalyptus hypostomatica – Eucalyptus agglomerata*

Tall open-forests occur on the sheltered escarpment slopes and gullies, receiving direct sunlight only in summer but diffuse sunlight all year round. Characteristic tree species include *Eucalyptus deanei* and *Syncarpia glomulifera,* which are common in the Thirlmere Lakes area; in the upper reaches of the Nattai and Little Rivers, *Eucalyptus agglomerata* and *Eucalyptus hypostomatica* also occur. There is generally a well-developed small-tree stratum to 10 m high of *Allocasuarina torulosa.* In the forest understorey in deep sheltered gullies, *Backhousia myrtifolia, Elaeocarpus reticulatus* and *Notelaea longifolia* are abundant. *Acacia elata, Acacia falciformis* and

Melaleuca styphelioides are also frequent. Ground cover is predominantly of ferns, particularly *Pteridium esculentum, Calochlaena dubia, Doodia aspera* and *Polystichum proliferum.* Other common ground cover plants include *Pratia purpurascens, Dichondra repens, Dianella caerulea* and *Lomandra longifolia.*

Restricted to alluvial soils along the Nattai and Little River valleys, tall forests of *Eucalyptus deanei* and *Eucalyptus elata* occur (Lembit 1989). Canopy height is between 25 and 30 m. A tall shrub layer of medium density contains species such as *Acacia parramattensis, Allocasuarina torulosa* and *Acacia decurrens.* Occasional rainforest species including *Doryphora sassafras, Callicoma serratifolia, Ficus coronata* and *Elaeocarpus reticulatus* occur. Ground layer vegetation includes grasses and ferns such as *Microlaena stipoides, Poa affinis, Oplismenus aemulus, Calochloena dubia* and *Doodia aspera.*

ii) Open-forest: *Eucalyptus crebra – Eucalyptus punctata – Eucalyptus eugenioides – Eucalyptus piperita*

The tall open-forests of the gullies grade into open-forests on the drier spurs of the escarpment foothills, as sites become drier and more exposed. Common tree species on these south to south-east facing spurs include *Eucalyptus crebra, Eucalyptus punctata* and *Eucalyptus eugenioides* particularly on clay soils. *Eucalyptus piperita* occurs on more sandy soils while *Angophora floribunda* occurs occasionally on alluvium. Common understorey species include *Allocasuarina littoralis, Olearia viscidula, Stypandra glauca, Pteridium esculentum, Persoonia linearis* and *Lissanthe strigosa.*

Figure 9. Moist Escarpment Forest (map unit 6hm) with Eucalyptus deanei near the Little River.

Map unit 6k
Robertson Basalt Tall Forest

Tall open-forest/open-forest:
Eucalyptus fastigata – Eucalyptus viminalis – Eucalyptus elata

Small remnants of this once-widespread vegetation occur on the western, drier parts of the Robertson basalt, south of Mittagong. The main tree species, *Eucalyptus fastigata, Eucalyptus viminalis, Eucalyptus elata* and *Eucalyptus radiata* subsp. *radiata* have different habitat requirements and may occur locally as pure or almost pure stands. The understorey includes the grass *Poa labillardieri*, and native herbaceous species. Most of the fertile basalt soils, have been cleared and the ground layer replaced with introduced pasture species. Other remnants further east are taller, and more mesic, sometimes with a rainforest understorey (Benson & Howell 1994b, Kodela 1990).

Map unit 8d
Kowmung Dry Rainforest

Closed-forest: *Toona ciliata – Dendrocnide excelsa – Alectryon subcinereus*

The Kowmung Wilderness in the north-western corner of the map sheet is characterised by gorges that cut down into the terrain some 450 m, for example near the Boyd Range where the Kowmung has eroded the range's sides from 1050 to 600 m. Here, small patches of rainforest occur on the sheltered lower slopes of deeply incised Devonian sediments, though the rainfall is only 250 mm p.a. Rainforest patches with *Toona ciliata, Dendrocnide excelsa* and *Alectryon subcinereus* occur on the dark, narrow valley floors of perennial streams and on sheltered, south-facing slopes. *Ehretia acuminata, Brachychiton populneum, Ficus rubiginosa, Claoxylon australe* and *Backhousia myrtifolia* are also common. Quantities of Red Cedar, *Toona ciliata* were cut from the wild slopes west of the Kowmung River early this century according to Craft (1932).

Where canopies are dense, there is a sparse understorey of shrubs, including *Hymenanthera dentata, Rapanea howittiana, Notelaea longifolia, Trema aspera* and *Deeringia amaranthoides.* Further upslope where soils are not as moist as on the valley floor, shrub species such as *Eriostemon myoporoides* and *Beyeria viscosa* occur. Vines and lianas are very common and include species such as *Rubus parvifolius, Aphanopetalum resinosum, Celastrus australis, Pandorea pandorana, Marsdenia flavescens, Marsdenia rostrata, Cissus hypoglauca* and *Cissus antarctica.* The herbaceous layer is characterised by species such as *Adiantum hispidulum, Adiantum formosum, Adiantum aethiopicum, Asplenium flabellifolium, Doodia aspera, Pellaea falcata, Urtica incisa, Stellaria flaccida, Plectranthus parvifolius* and *Oplismenus aemulus.*

Kowmung Dry Rainforest extends further north onto the Katoomba map (Keith & Benson 1988, Steenbeeke 1990).

Map unit 9i
Blue Mountains Sandstone Plateau Forest

There are three major floristic groups associated with the sandstone landscapes in the map area:

1. Blue Mountains Sandstone Plateau Forest (map unit 9i) occurs at high altitudes (>800 m) and is the main vegetation of the upper Blue Mountains;
2. Mittagong Sandstone Woodland (map unit 10z) occurs at intermediate altitudes (700–800 m) and is the main vegetation of the Mittagong – Moss Vale area; and
3. Sydney Sandstone Complex (map units 10ag and 10ar) occurs at low altitudes (<700 m) and is the main vegetation of the Triassic sandstone of the Sydney area.

There is an overlap of species throughout these communities owing to similar characteristics between the Triassic sandstone (on which 10a, 10z and 9i occur on) and Permian sandstone (on which 9i also occurs on). For example *Eucalyptus sieberi* and *Eucalyptus piperita* are common to all three communities. There is, however, a separation owing to altitude and this is expressed in the co-dominant and sub-dominant canopy species and the understorey which characterise the three communities. For example, co- and sub-dominants restricted to the low altitudes include *Angophora costata, Eucalyptus gummifera, Syncarpia glomulifera, Acacia linifolia* and *Hibbertia empetrifolia* while co- and sub-dominant species

restricted to the high altitudes include *Eucalyptus radiata* subsp. *radiata, Eucalyptus mannifera* subsp. *gullickii, Banksia spinulosa* var. *cunninghamii, Persoonia chamaepitys* and *Stellaria pungens.*

Open-forest: *Eucalyptus sieberi – Eucalyptus piperita*

Blue Mountains Sandstone Plateau Forest, an open-forest of *Eucalyptus sieberi* and *Eucalyptus piperita*, mainly occurs in the Blue Mountains at elevations of 800–1000m on Triassic Narrabeen sandstone (Keith & Benson 1988). The soils are shallow, sandy, low in nutrients and well-drained. In more sheltered situations, the *Eucalyptus sieberi – Eucalyptus piperita* open-forest is taller and includes other species such as *Eucalyptus radiata* subsp. *radiata.* In more exposed areas Keith & Benson record trees of *Eucalyptus sclerophylla, Eucalyptus sparsifolia* and *Eucalyptus mannifera* subsp. *gullickii* with understorey shrubs including *Leptospermum trinervium, Petrophile pulchella, Banksia ericifolia, Banksia spinulosa* var. *spinulosa, Banksia spinulosa* var. *cunninghamii, Persoonia chamaepitys* and *Acacia terminalis.*

In the Burragorang area, this vegetation is restricted to the Permian sediments of the Bindook Highlands and the high plateaus just south and west of Yerranderie–Mootik Plateau, Tonalli Mountain, Mt Marrup and Yerranderie Peak. Elevation ranges from 800–1150 m.

Map Unit 9n
Montane Moist Forest

Open-forest: *Eucalyptus fastigata – Eucalyptus dalrympleana – Eucalyptus viminalis*

Montane Moist Forests with *Eucalyptus fastigata, Eucalyptus viminalis* and *Eucalyptus dalrympleana* subsp. *dalrympleana* occur on folded Devonian sediments, Silurian metasediments and Kanangra Granite. It is common in the north-western part of the study area at elevations above 700 m which have a high rainfall (900–1100 mm p.a.). *Eucalyptus fastigata* occurs on the most fertile and sheltered sites, often in pure stands. *Eucalyptus dalrympleana* subsp. *dalrympleana* occurs on the poorer sites while *Eucalyptus viminalis* is most common along creek lines. *Eucalyptus radiata* subsp. *radiata* occurs on upper ridges.

Understorey shrubs are quite scattered and include *Acacia melanoxylon, Acacia implexa, Platysace lanceolata, Lomatia myricoides, Indigofera australis* and *Swainsona galegifolia.* The herb layer is continuous and includes species such as *Geranium potentilloides* var. *abditum, Stellaria pungens, Hydrocotyle laxiflora, Lomandra longifolia* and *Polystichum proliferum.* Grasses include *Dichelachne rara* and *Poa labillardieri.*

Similar vegetation is extensive on the Katoomba sheet (Keith & Benson 1988).

Map unit 9to
Taralga Ordovician Forest

Open-forest: *Eucalyptus agglomerata – Eucalyptus macrorhyncha – Eucalyptus punctata – Eucalyptus sieberi*

The deeply dissected Ordovician sediments (grey slate, quartz rich and feldspathic greywacke and andesite) of the south-west of the map area, west of Barrallier and the Bindook Highlands, support brown, sandy soils covered by open-forest. Stringybarks *Eucalyptus agglomerata* and *Eucalyptus macrorhyncha*, and *Eucalyptus sieberi* are widespread on broader ridges, on exposed western slopes and on rocky, cool sites. *Eucalyptus punctata* may also occur on broader ridges with the stringybarks but is particularly widespread on the moister slopes. It also persists into the gullies where it may grow as very large, tall trees. *Eucalyptus punctata* and *Eucalyptus sieberi* prefer higher rainfall areas. In the sheltered gullies and on the cool and moist slopes, *Eucalyptus dives* is the main canopy species.

Present to a lesser degree on the more fertile or deeper soils are *Eucalyptus melliodora* and *Eucalyptus blakelyi.* Shrub species here include *Acacia falciformis, Acacia melanoxylon, Acacia decurrens, Acacia dealbata, Exocarpus cupressiformis, Oxylobium ilicifolium, Bursaria spinosa* and *Stypandra glauca.*

On narrower and drier ridgetops and on the drier, western slopes, the open-forest grades into woodland. Here, *Eucalyptus rossii* is very common, occurring as low trees (up to 10 m high) and forming a very open canopy (approximately 10% cover). It commonly occurs in monospecific stands on the upper slopes and may grade into

Eucalyptus macrorhyncha woodlands further down the slope where it is cooler. Woodlands of *Eucalyptus mannifera* may also occur on these drier western slopes but are less common than the woodlands of *Eucalyptus rossii*. Shrubs associated with the drier woodlands include *Leucopogon muticus, Leucopogon microphyllus, Acacia buxifolia, Lissanthe strigosa, Melichrus erubescens* and *Pomaderris andromedifolia.*

Map unit 9w
Wingecarribee Forest

Open-forest: *Eucalyptus sieberi – Eucalyptus punctata – Eucalyptus eugenioides – Eucalyptus mannifera*

On the upper slopes of the Wingecarribee River and on Joadja Plateau and Sandy Flat, between 600 and 750 m elevation, open-forests of *Eucalyptus sieberi, Eucalyptus punctata, Eucalyptus eugenioides* and *Eucalyptus mannifera* occur on soils from the Permian Illawarra Coal Measures. Understorey species include *Acacia obtusifolia, Acacia falciformis, Acacia decurrens, Lomandra longifolia, Kunzea parvifolia, Leptospermum arachnoides, Daviesia corymbosa, Bossiaea prostrata, Hibbertia obtusifolia, Lomatia ilicifolia, Persoonia linearis* and *Helichrysum scorpioides.*

Map unit 9x
River Oak Forest

Open-forest: *Casuarina cunninghamiana*

Alluvial soils, consisting of mobile gravels and sands, are associated with the major watercourses, Wollondilly, Nattai, Kowmung and Little Rivers, and support open-forest with *Casuarina cunninghamiana* subsp. *cunninghamiana* along the river channel and banks and *Angophora floribunda* further back from the watercourse. The understorey is quite sparse, consisting of a mixture of native and exotic (marked with *) herbs and grasses, including **Conyza albida*, **Modiola caroliniana*, **Hypochaeris radicata*, *Persicaria decipiens*, *Oplismenus aemulus*, **Rumex crispus* and *Cynodon dactylon.* The shrub layer is sparse, consisting of scattered shrubs, including *Hymenanthera dentata, Acacia floribunda, Acacia longifolia, Acacia fimbriata* and *Bursaria spinosa.*

Map unit 9y
Mount Gibraltar Forest

As well as the Robertson Basalt, there are outcrops of other volcanic rocks, solvsbergite, microsyenite, bostonite and trachyte (NSW Dept of Mines 1966) around Mittagong: at Mount Gibraltar, Mount Jellore, Mount Flora, Mount Misery and Cockatoo Hill. Much of this has been cleared, particularly as these outcrops are often associated with basalt areas but substantial vegetation still remains on microsyenite outcrops on Mount Gibraltar and on trachyte at Mount Jellore, with small remnants of vegetation on Mount Misery, Cockatoo Hill and Mount Flora.

i) Open-forest: *Eucalyptus piperita – Eucalyptus radiata – Eucalyptus smithii*

The best example of this vegetation is on Mount Gibraltar where extensive areas of open-forest up to 25 m high with *Eucalyptus piperita* and *Eucalyptus radiata* subsp. *radiata* on the lower slopes, together with *Eucalyptus smithii* on the more exposed ridge. Understorey species are predominantly herbaceous and grassy and include *Stypandra glauca, Dianella caerulea, Dichondra repens, Themeda australis, Blechnum cartilagineum, Adiantum aethiopicum, Tylophora barbata, Oreomyrrhis eriopoda, Cymbopogon refractus, Senecio linearifolius, Polyscias sambucifolia, Exocarpus cupressiformis, Leucopogon lanceolatus* and *Lomandra longifolia.* This vegetation is very rich in groundcover and includes many species that would have occurred on the nearby basalt and shale soils that have been cleared and replaced with introduced pastures. Mount Gibraltar Reserve is therefore a very important conservation area for many of these formerly widespread species.

ii) Low woodland: *Eucalyptus blaxlandii – Allocasuarina verticillata*

Mount Jellore Woodland, 11km north-west of Mittagong, is an isolated conically-shaped peak, 833 m high, surrounded by steep cliffs with scree slopes below, and rising above the surrounding Triassic Hawkesbury sandstone plateau. Geologically it is trachyte, a rare rock type in the Sydney district but which makes up such other well-known NSW Mountains as the Warrumbungle Ranges near Coonabarabran and Mt Canobolas near Orange.

The vegetation is diverse, ranging from woodland to scrub, depending on aspect. Vegetation of the summit area is mostly a low woodland of *Eucalyptus blaxlandii* and *Allocasuarina verticillata* with occasional *Eucalyptus tereticornis* (here 'mountain form'—a distinctive race, L.A.S. Johnson pers. comm.). Understorey species and structure change depending on aspect: the more exposed eastern and western sides are predominantly grassy with occasional shrubs; on the more sheltered southern side, grasses give way to graminoides such as *Lomandra longifolia, Lomandra multiflora* and *Dianella revoluta* (Benson 1979). The north face of the summit area is covered in a scrub of *Acacia binervia* with clumps of *Lepidosperma laterale.*

After an early botanical visit to Mt Jellore, Shiress (1916) wrote 'the summit, which is hardly an acre in extent was covered with *Casuarina stricta* [now *Allocasuarina verticillata*], a few stunted trees of *Casuarina suberosa* [*Allocasuarina littoralis*], and that charming bush *Westringia eremicola* [*Westringia longifolia*], had a few lingering flowers, and wonder of wonders, *Acacia glaucescens* [*Acacia binervia*], which appeared to clothe the whole of the northern side of the mount right on to the summit'.

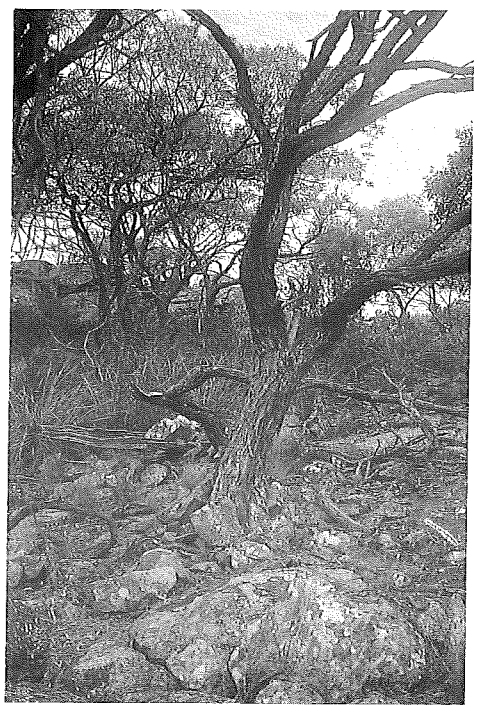

Figure 10. *Acacia binervia* on the summit of Mount Jellore (map unit 9y).

The lower slopes of Mt Jellore are covered in woodland to open-forest with *Eucalyptus blaxlandii, Eucalyptus eugenioides* and *Eucalyptus agglomerata.* There are occasional occurrences of *Eucalyptus elata* and *Eucalyptus cypellocarpa.*

Sydney Sandstone Complex (map units 10ag and 10ar)

This vegetation complex is widespread on the lower elevation (<700 m) Hawkesbury and Narrabeen Group sandstones throughout the Sydney Basin. Community structure and floristics vary considerably, with topographical position, local soil conditions, drainage, aspect and fire history being important influences. Two subunits are recognised, separated principally on topographical position. A moist forest type is associated with the gullies, creek lines and sheltered slopes (map unit 10ag) and a dry woodland is associated with ridges and exposed slopes (map unit 10ar). There is overlap between these subunits, and also between them and the higher-altitude sandstone vegetation units (map units 10z and 9i).

Map unit 10ag Sydney Sandstone Gully Forest

Open-forest: *Eucalyptus piperita – Eucalyptus agglomerata – Angophora costata*

Sydney Sandstone Gully Forest occurs on Hawkesbury sandstone on sheltered slopes and gullies and along creeks draining into the Nattai and Little Rivers. Moist, well-drained, shallow sandy-loams support open-forest of *Eucalyptus piperita, Eucalyptus agglomerata, Angophora costata* and *Syncarpia glomulifera* and occasionally *Eucalyptus gummifera. Eucalyptus agglomerata* occurs with *Syncarpia glomulifera* in the most sheltered situations. The understorey includes small trees of *Allocasuarina torulosa* and *Acacia elata* and shrubs of *Hakea dactyloides, Pultenaea flexilis, Leptospermum trinervium, Grevillea buxifolia* and *Dodonaea triquetra.* Similar vegetation is extensive further east in the catchments of Avon and Nepean Dam (Benson & Howell 1994a)

Map unit 10ar
Sydney Sandstone Ridgetop Woodland

Woodland/open-forest: *Eucalyptus sieberi – Eucalyptus sclerophylla – Eucalyptus piperita – Eucalyptus gummifera*

Sydney Sandstone Ridgetop Woodland is widespread on Hawkesbury Sandstone ridges and exposed, north to north-eastern and north-western slopes, on the Nattai and Wanganderry Tablelands. Soils are generally shallow, sandy and well-drained, supporting woodlands and low woodlands. *Eucalyptus gummifera, Eucalyptus sieberi, Eucalyptus piperita* and *Eucalyptus sparsifolia* are common canopy species along ridges. *Eucalyptus sclerophylla* commonly occurs on exposed rocky knolls which are on higher ground than the surrounding ridge-top vegetation. In the slightly more sheltered areas, *Eucalyptus piperita* may occur with *Angophora costata* and *Eucalyptus punctata.*

The understorey is rich in shrubs from the families Proteaceae, Myrtaceae and Fabaceae. Common species include *Banksia spinulosa* var. *spinulosa, Xanthorrhoea* spp., *Persoonia linearis, Hakea dactyloides, Banksia serrata, Lomatia silaifolia, Lambertia formosa, Grevillea mucronulata, Lomandra longifolia, Hardenbergia violacea, Dianella revoluta, Comesperma ericinum, Leptospermum trinervium, Entolasia stricta* and *Kunzea ambigua.*

The southern geographical limit of *Angophora costata* occurs on the ridges and adjacent slopes south of Wanganderry Lookout, on the Wanganderry Plateau; on the edge of the sandstone plateau. The understorey is characterised by species such as *Stypandra glauca, Pteridium esculentum, Persoonia linearis* and *Lomandra longifolia.*

Map unit 10bh
Bindook Highlands Woodland

This community occurs on the southern part of the Bindook Highlands, southwest of Yerranderie, on soils derived from sandstones and siltstones of the Shoalhaven Group Megalong Conglomerate. Elevation is 800–900 m and annual rainfall 800–900 mm.

i) Woodland: *Eucalyptus sieberi – Eucalyptus sparsifolia.*

Woodlands of *Eucalyptus sieberi* are common throughout the Bindook Highlands, especially in exposed areas with shallower soils. *Eucalyptus sparsifolia* occurs with *Eucalyptus sieberi* on ridges and exposed slopes particularly on shallow and infertile soils. *Eucalyptus punctata* is found in a range of habitats, being especially common on undulating country and is frequent throughout the area.

ii) Woodland: *Eucalyptus sieberi – Eucalyptus eugenioides.*

Woodland with *Eucalyptus sieberi* and *Eucalyptus eugenioides* occurs on ridges and exposed slopes, where soils are deeper.

iii) Woodland/open-forest: *Eucalyptus radiata – Eucalyptus cypellocarpa – Eucalyptus fastigata.*

Woodlands of *Eucalyptus radiata* subsp. *radiata* are frequent on cold, sheltered slopes with deeper soils, as on the Jooriland Range and Pimlico Ridge. In moister areas and creek lines, *Eucalyptus goniocalyx* and *Eucalyptus fastigata* occur with *Eucalyptus radiata.*

Common understorey species in these woodland communities include *Leucopogon lanceolatus, Bursaria spinosa, Acacia longifolia, Acacia parramattensis, Acacia floribunda, Calochleana dubia, Persoonia linearis, Pteridium esculentum, Blechnum cartilagineum, Lomandra longifolia, Oxylobium ilicifolium* and *Leptospermum polygalifolium.* Ground cover includes *Echinopogon ovatus, Dianella revoluta* and *Lomandra longifolia.*

On the Myall Causeway, along the Bindook–Murruin Stockroute, is a patch of heath on shallow, skeletal soils with species similar to those on Hawkesbury Sandstone, including *Banksia serrata, Banksia spinulosa, Persoonia linearis, Acacia longifolia, Leptospermum polygalifolium, Acacia obtusifolia* and *Pomaderris andromedifolia.*

Map unit 10dw
Douglas Scarp Woodland

Woodland: *Eucalyptus crebra – Callitris endlicheri – Acacia binervia*

Of very limited distribution, this woodland is restricted to the outcropping basal sediments of the Shoalhaven Group along the Douglas Scarp, near the Wollondilly River where it joins Lake Burragorang. Elevation and rainfall here are both relatively low, elevation is 220 m asl and rainfall is 800 mm p.a. (Bureau of Meteorology 1979) as a result of the rainshadow along the Wollondilly River.

Douglas Scarp Woodland is characterised by the presence of *Eucalyptus crebra, Callitris endlicheri* and *Acacia binervia*, the understorey has occasional dense patches of shrubs, but is generally grassy. *Callitris endlicheri* occurs here as an isolated population — it occurs more commonly on the tablelands and western slopes — and may have survived here under conditions of infrequent fire. The occurrence of *Acacia binervia* may also be indicative of infrequent fire. Understorey shrubs include *Leucopogon muticus, Olearia viscidula, Allocasuarina verticillata, Astroloma humifusum* and *Grevillea ramosissima.* Ground layer species include *Dichelachne micrantha, Lomandra filiformis, Cheilanthes sieberi, Pomax umbellata* and *Goodenia hederacea.*

Map unit 10l
Snow Gum Woodland

Woodland: *Eucalyptus pauciflora – Eucalyptus dalrympleana*

Snow Gum Woodland is widespread on the Boyd and Loombah Plateau and on undulating country above 1000 m (Keith & Benson 1988; Steenbeeke 1990). It is commonly found on shallow to moderately deep loams and sandy loams, derived from either granite or quartzite of both Devonian Lambie Group and the Kowmung volcanoclastics.

The dominant canopy species are *Eucalyptus pauciflora* and *Eucalyptus dalrympleana* subsp. *dalrympleana.* In frost hollows, where air drainage is poor, woodlands of *Eucalyptus pauciflora* and *Eucalyptus stellulata* occur. On sites which are colder and drier than average, *Eucalyptus rubida* subsp. *rubida* occurs occasionally (Black 1982). In the understorey, common shrub species include

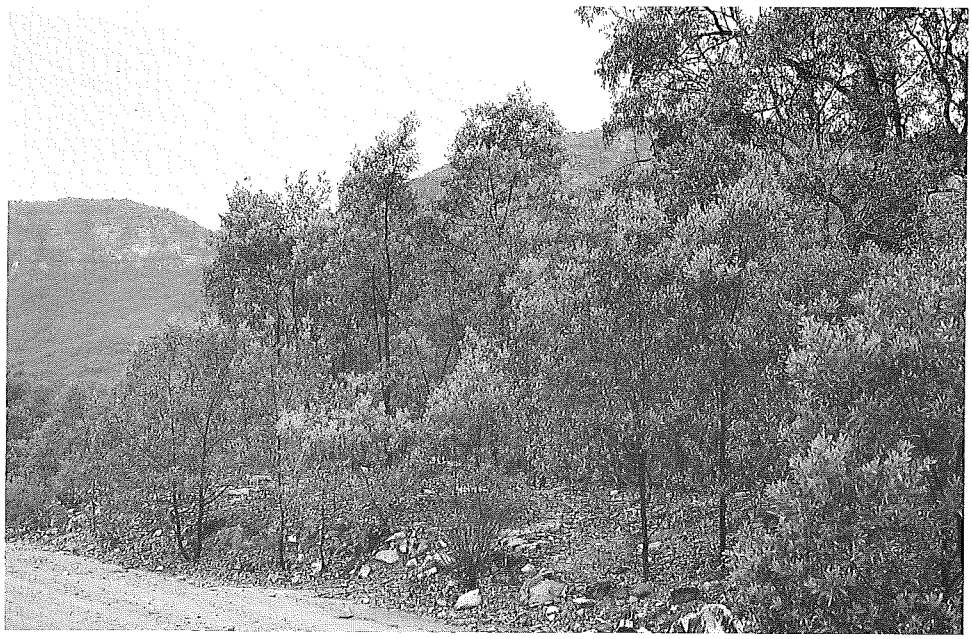

Figure 11. Douglas Scarp Woodland (map unit 10dw) with *Acacia binervia* prominent.

Acacia dealbata, Acacia obliquinervia, Lomatia myricoides, Platysace lanceolata and *Amperea xiphoclada.* Herbs and grasses form a continuous layer including such species as *Stellaria pungens, Poa sieberiana, Poa labillardieri, Poranthera microphylla, Geranium* spp. and *Plantago* spp. *Lomandra longifolia, Lomandra glauca* and *Pteridium esculentum* occur occasionally.

Where Kanangra granite is exposed, skeletal soils support low open-heath (Steenbeeke 1990). It is dominated by *Leptospermum lanigerum, Leptospermum myrtifolium, Callistemon sieberi, Baeckea brevifolia* and *Isotoma petraea.*

Map unit 10mr
Montane Ridge Woodland

Woodland: *Eucalyptus sieberi – Eucalyptus radiata – Eucalyptus dives – Eucalyptus mannifera*

Montane Ridge Woodland occurs on high-elevation (850–1200 m) ridgetops and exposed slopes along the western margin of the map area from the Loombah Plateau in the north to Barrallier in the south. Occurring on sandy, shallow soils of Ordovician and Silurian sediments, the woodland is dominated by *Eucalyptus sieberi, Eucalyptus radiata* subsp. *radiata, Eucalyptus dives* and *Eucalyptus mannifera.* The understorey is very sparse, containing *Banksia spinulosa, Persoonia linearis, Acacia terminalis, Hakea dactyloides, Acacia obtusifolia, Leptospermum obovatum* and *Hibbertia obtusifolia.*

Montane Ridge Woodland grades into Montane Moist Forest (map unit 9n) downslope in the gullies.

Map unit 10p
Kowmung Wilderness Complex

Kowmung Wilderness Complex occupies a large, mostly inaccessible, area of deeply dissected country of steep, narrow gorges and gullies in the shadows of narrow ridges and mountains. This is the Kowmung Valley and it is characterised by the rugged terrain carved into quartzites, sandstones, siltstones and claystones of the Devonian Lambie and Silurian Groups. Elevation ranges from 300 m to 1000 m. The well-drained clay loams derived from these rocks support a complex vegetation community. The Kowmung Wilderness Complex has been described by Keith and Benson (1988) and Steenbeeke (1990).

There are several associations occurring in the Kowmung Wilderness Complex, groups of species changing with topographical position and aspect.

i) Woodland: *Eucalyptus punctata – Eucalyptus agglomerata*

On the ridges, drier aspects and well-drained soils, *Eucalyptus punctata* and *Eucalyptus agglomerata* are very common together with *Eucalyptus crebra* on more clayey soils and *Eucalyptus fibrosa* on lower nutrient soils.

ii) Tall open-forest: *Eucalyptus cypellocarpa – Eucalyptus viminalis – Angophora floribunda*

In gullies, along watercourses and on sheltered valley slopes, tall open-forest of *Eucalyptus tereticornis* and *Eucalyptus cypellocarpa,* often with *Eucalyptus viminalis* and *Angophora floribunda*, is common. *Eucalyptus deanei* is scattered throughout the eastern parts of the valley replacing *Eucalyptus tereticornis.* The shrub layer is variable, ranging from sparse to dense depending on the amount of moisture and light. Common species throughout include *Bursaria longisepala, Bursaria spinosa, Breynia oblongifolia, Acacia clunies–rossiae, Acacia amoena, Acacia falciformis* and *Persoonia linearis,* various Epacridaceae such as *Lissanthe strigosa, Leucopogon lanceolatus, Leucopogon esquamatus* and *Leucopogon juniperinus* and various peas such as *Oxylobium ilicifolium, Dillwynia retorta, Kennedia rubicunda* and *Desmodium varians.*

Map unit 10pw
Porphyry Box Woodland

Woodland: *Eucalyptus tereticornis – Eucalyptus melliodora – Eucalyptus moluccana – Eucalyptus albens.*

Porphyry Box Woodland occurs on loamy red texture-contrast soils derived from soft, easily-weathered parent material of the Bindook Porphyry complex. Bindook Porphyry is common west of the Wollondilly River in the west and south-west of the map sheet area, from Yerranderie to Bullio, Goodmans Ford, Hanworth and Bannaby. Annual rainfall is 800–900 mm.

The predominant tree species are *Eucalyptus tereticornis, Eucalyptus melliodora, Eucalyptus moluccana, Eucalyptus albens* and *Eucalyptus macrorhyncha,* occurring in various combinations. *Brachchyton populneus* subsp. *populneus* and *Angophora floribunda* occur on sheltered slopes and gullies. *Eucalyptus tereticornis* and *Eucalyptus melliodora* predominate on the eastern side of the Wollondilly Valley while *Eucalyptus tereticornis* and *Eucalyptus moluccana* predominate on the western side of the valley, where *Eucalyptus melliodora* occurs occasionally (*Eucalyptus albens* occurs on more base-rich soils than *Eucalyptus moluccana*). In the south-west of the map area, near Bannaby, *Eucalyptus tereticornis, Eucalyptus macrorhyncha* and *Eucalyptus moluccana* occur together. In the Joorilands area, *Eucalyptus albens* occurs with *Eucalyptus melliodora.*

The understorey is sparse, with scattered shrubs of *Olearia viscidula, Acacia floribunda, Acacia decurrens* and *Bursaria spinosa.* Herbs and grasses in the ground layer include *Themeda australis, Microlaena stipoides, Aristida vagans, Cymbopogon refractus* and *Cheilanthes sieberi.*

Much of the Porphyry Box Woodland has been cleared and the condition of remnants depends on grazing pressures. The hardsetting red loams derived are favoured for farming, in preference to the adjoining sandy soils further east of the Wollondilly and on air photos and maps, the boundaries of cleared country generally coincide with the Porphyry geology. In contrast the vegetation of the adjacent sandy soils (on Permian Shoalhaven geology), the Burragorang Ironbark Woodland (map unit 10q), remains largely uncleared.

Map unit 10q
Burragorang Ironbark Woodland

Burragorang Ironbark Woodland occurs around the foreshores of Lake Burragorang on the low-elevation (150–300 m), undulating country between main water courses and the Triassic sandstone escarpment; and, higher (300–570 m) and further west, in the catchments of the Tonalli River and Butchers Creek. It is a tall woodland occurring on shales, sandstones and conglomerate of the Shoalhaven Group. Presence and dominance of certain species are influenced by changes in ecological factors such as soil depth, topography, drainage and aspect.

i) Woodland: *Eucalyptus crebra – Eucalyptus punctata – Eucalyptus eugenioides*

On the low-elevation, undulating country around the Lake area, *Eucalyptus crebra, Eucalyptus punctata* and *Eucalyptus eugenioides* are common on gentle to moderate slopes. *Eucalyptus agglomerata* and *Eucalyptus fibrosa* are common in sheltered sites. On slopes with an essentially north-eastern aspect, *Eucalyptus tereticornis* occurs in wetter situations, such as gullies, creeklines and poorly-drained flats, *Melaleuca linariifolia* being common in the understorey. *Eucalyptus albens* and *Eucalyptus melliodora* are common on the foreshores and undulating country west of the Lake; and on hills of Upper Burragorang, south of Tonalli Peak on the Shoalhaven Formation.

In the higher-elevation catchments of the Tonalli River and Butchers Creek, where temperatures are generally cooler, *Eucalyptus quadrangulata* becomes a common subdominant occurring on slopes and *Eucalyptus cypellocarpa* becomes common in the sheltered gullies.

ii) Woodland: *Eucalyptus sclerophylla – Angophora bakeri*

Eucalyptus sclerophylla and *Angophora bakeri* occur on exposed sites with shallow soils, such as near where the Nattai River joins Lake Burragorang. Understorey is characterised by low shrubs with a patchy ground layer. Common shrubs include *Banksia spinulosa* var. *spinulosa, Dillwynia retorta, Jacksonia scoparia* and *Leucopogon muticus.* Characteristic herbs and grasses include *Stipa pubescens, Entolasia stricta, Lomandra obliqua* and *Goodenia hederacea.* Small patches of open-scrub dominated by *Kunzea ambigua* occur on poorly-drained sites that have been previously cleared.

iii) Low closed-forest: *Backhousia myrtifolia*

Grey Myrtle Low Forest dominated by *Backhousia myrtifolia* occurs in sheltered aspects in the upper Burragorang valley. It is also found along the Coxs River arm of Lake Burragorang and in Kanangra–Boyd National Park. Soils have a relatively high organic content and may be derived from Shoalhaven Group sediments or Bindook Porphyry parent materials. *Ficus rubiginosa* may be present as a canopy species in rocky areas and emergent eucalypts occur where this map unit merges into adjacent woodland communities.

Figure 12. Porphyry Woodland (map unit 10pw), *Eucalyptus moluccana* with an understorey of grasses and patches of shrubs.

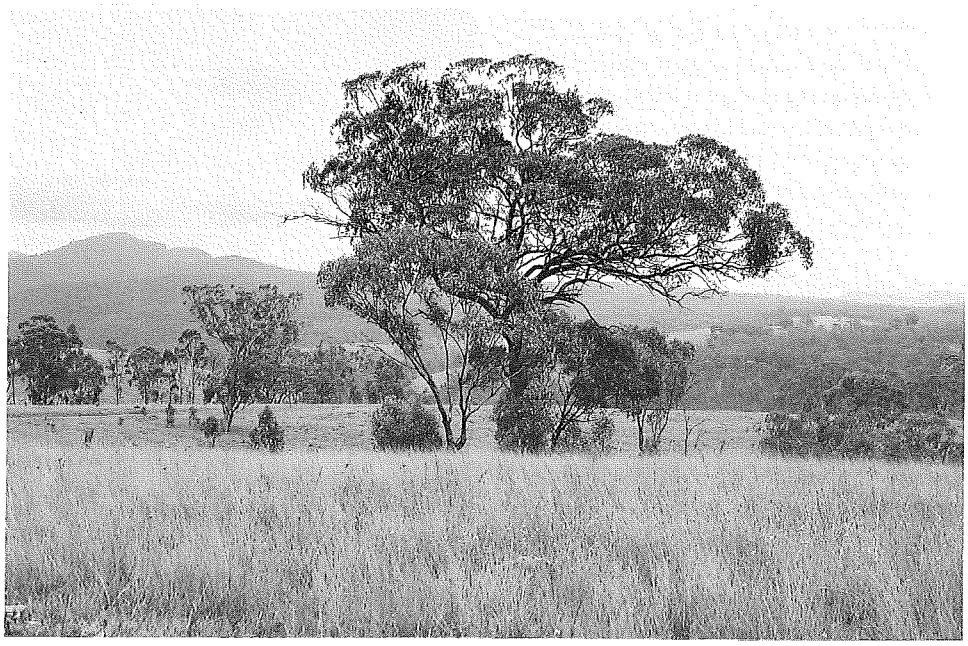

Figure 13. Cleared Porphyry Woodland (map unit 10pw) at Jooriland near the southern end of Lake Burragorang. Continued grazing by stock has hindered eucalypt regeneration.

Other tall shrubs or small trees may include *Hedycaria angustifolia*, *Notelaea longifolia* and *Clerodendrum tomentosum*. The understorey is generally dominated by ferns with occasional grassy patches and several vines. Common ferns include *Pellaea falcata, Doodia aspera, Asplenium flabellifolium* and *Adiantum aethiopicum*. The grasses include *Oplismenus aemulus* and *Digitaria parviflora*. Vines include *Pandorea pandorana, Stephania japonica* var. *discolor, Tylophora barbata, Passiflora herbertiana* and *Cayratia clematidea*.

Burragorang Ironbark Woodland is similar to the Kowmung Wilderness Complex (map unit 10p) which lies to the north-west; and although occurring on different geological types (Shoalhaven and Devonian sediments respectively), these two units are very similar. They differ, however, in the following ways:

1. the species that occupy the more sheltered parts of the two valleys, the Burragorang and the Kowmung, are different. In the sheltered slopes and gullies of the Burragorang Valley, *Eucalyptus deanei, Eucalyptus tereticornis* and *Eucalyptus agglomerata* occur. In ecologically similar parts of the Kowmung Valley, *Eucalyptus viminalis, Eucalyptus dalrympleana* subsp. *dalrympleana* and *Eucalyptus fastigata* occur.

2. within each valley the areal extent of these sheltered components differs. The deeply incised and rugged Devonian sediments of the Kowmung Valley provide many more sheltered slopes and gullies than do the Shoalhaven sediments of the Burragorang Valley. The result is that there is much more of the sheltered, moist community in the Kowmung than there is in the Burragorang Valley. The Kowmung Valley tends to be wetter, even supporting closed-forest in its deepest gullies; while the Burragorang Valley tends to be drier, supporting lower, more open woodlands.

Map unit 10r
Residual Sandstone Woodland

Woodland: *Eucalyptus sieberi – Eucalyptus blaxlandii*

This high-elevation (800–1000 m) woodland is found in the north-western part of Bindook Highlands on well-drained, low-nutrient, shallow, sandy soils derived from residual sandstones of the Shoalhaven Group. *Eucalyptus sieberi* and *Eucalyptus blaxlandii* are the characteristic tree species. Woodlands of pure *Eucalyptus sieberi* occur where soils are lowest in fertility. *Eucalyptus blaxlandii* occurs with *Eucalyptus sieberi* where soils are a little more fertile. *Eucalyptus piperita* and *Eucalyptus melliodora* also occur, with *Eucalyptus punctata* at lower elevations. The understorey is of variable density, with *Oxylobium ilicifolium, Leucopogon lanceolatus, Banksia spinulosa* var. *spinulosa, Persoonia linearis, Persoonia laurina* subsp. *leiogyna, Acacia terminalis, Acacia obtusifolia, Montoca scoparia* and *Platysace lanceolata.*

There is an isolated occurrence of *Eucalyptus muelleriana* on poor, shallow soils on the Bindook Highlands, at an elevation of 800–850 m. This is much higher than its normal range (0–450 m) on the Illawarra Escarpment (Benson & Howell 1994a) and is the most north-western occurrence of the species.

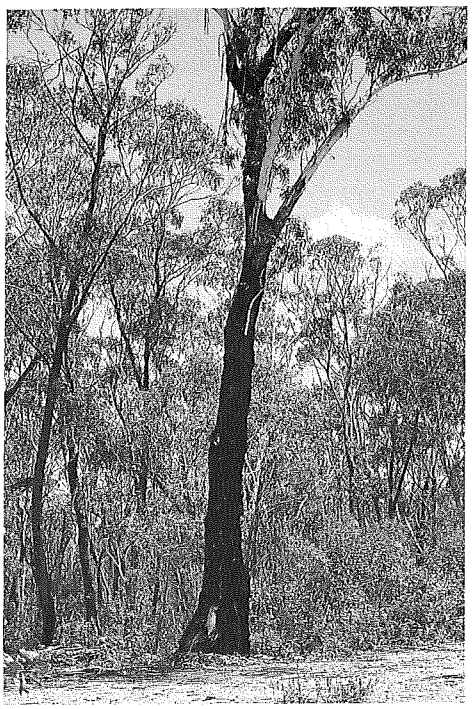

Figure 14. Residual sandstone woodland with *Eucalyptus sieberi* (map unit 10r).

Map unit 10s
Montane Woodland

Woodland: *Eucalyptus radiata – Eucalyptus dalrympleana*

Montane Woodland is restricted to the high-altitude (>900 m) flat undulating country around the Kanangra Tops – Boyd Plateau area (Steenbeeke 1990, Keith & Benson 1988). It occurs on well-drained to damp sandy loams on Carboniferous granite and Devonian Lambie Group metasediments. It grades into Montane Moist Forest (map unit 9n) in sheltered sites and into Residual Sandstone Woodland (map unit 10r) in exposed rocky ridges and plateau edges on both geological formations.

Eucalyptus radiata subsp. *radiata, Eucalyptus dives* and *Eucalyptus dalrympleana* subsp. *dalrympleana* are the main canopy tree species, with the occasional occurrence of *Eucalyptus pauciflora*, particularly at higher altitudes.

The understorey is sparse, with species such as *Acacia obliquinervia, Acacia dealbata, Leucopogon lanceolatus* var. *lanceolatus, Lomatia myricoides* and *Persoonia oxycoccoides*. Common grass species include *Poa sieberiana, Poa labillardieri* and *Dichelachne rara*, together with *Gonocarpus teucrioides, Gonocarpus tetragynus, Lomandra longifolia, Lomandra glauca, Wahlenbergia communis* and *Hydrocotyle laxiflora*.

Eucalyptus ovata occurs in poorly-drained depressions, occasionally with *Eucalyptus stellulata*, and with understorey species such as *Leptospermum obovatum, Gahnia sieberiana, Juncus laeviusculus* subsp. *illawarrensis, Restio fimbriatus* and *Blechnum minus*.

Map unit 10w
Joadja Stringybark Woodland

Woodland: *Eucalyptus agglomerata – Eucalyptus eugenioides*

Joadja Stringy-bark Woodland is common on steep rocky slopes along the valley of the Wingecarribee River from Medway to Joadja and to the confluence with the Wollondilly. Elevation ranges from 600–700 mm, annual rainfall is about 900 mm and soils are sandy loams to clays on Permian Shoalhaven Group sediments. The stringybarks, *Eucalyptus agglomerata* and *Eucalyptus eugenioides* are the main canopy species with some *Eucalyptus punctata*. The understorey is shrubby and may include *Acacia decurrens, Olearia viscidula, Daviesia mimosoides, Oxylobium ilicifolium, Monotoca scoparia, Persoonia linearis, Lomatia silaifolia, Lomandra confertifolia, Goodenia bellidifolia, Cassinia cunninghamii, Pteridium esculentum, Poa labillardieri, Microlaena stipoides* and *Echinopogon ovatus*. Sheltered gullies with deeper soils may have open-forest with *Eucalyptus elata* with *Melaleuca linariifolia, Gahnia* and *Gleichenia* along creek lines.

Map unit 10x
Southern Highlands Shale Woodlands

In the southeastern corner of the map sheet is the Wianamatta Shale country that is characteristic of the Southern Highlands. This extends from west of Mittagong and Bowral, eastwards to the Illawarra Escarpment and south to Bundanoon. The shale forms relatively fertile clay soils originally supporting a range forest and woodland vegetation, most of which has now been cleared for agriculture. In the map sheet area the shale country occupies a gently undulating plateau from 600–700 m elevation with a rainfall of about 900 mm per annum. Two communities are described here but remnants are very variable.

i) Open-forest: *Eucalyptus cypellocarpa – Eucalyptus quadrangulata – Eucalyptus globoidea*

This community occurs in the Aylmerton area on soils derived from Wianamatta Shale along the southern edge of the Hawkesbury Sandstone of the Woronora Plateau. It occurs from Mittagong eastward to the Illawarra Escarpment near Macquarie Pass (Benson & Howell 1994b). Dominant canopy species include *Eucalyptus quadrangulata, Eucalyptus globoidea* and *Eucalyptus punctata. Eucalyptus amplifolia* subsp. *amplifolia* and *Eucalyptus ovata* occur in sites with poor drainage. *Eucalyptus macarthurii* occurs occasionally but is more common south of the map sheet area. Common understorey species include *Oxylobium ilicifolium, Melaleuca thymifolia, Olearia microphylla, Cassinia uncata, Acacia mearnsii* and *Amperea xiphoclada*. Most of this community has been cleared.

ii) Woodland: *Eucalyptus ovata – Eucalyptus amplifolia* subsp. *amplifolia*

Broad, poorly-drained depressions on Wianamatta Shale soils may have remnants of woodland with *Eucalyptus ovata* and *Eucalyptus amplifolia* subsp. *amplifolia*, perhaps with *Eucalyptus macarthurii.*

iii) Woodland: *Eucalyptus cinerea – Eucalyptus globoidea*

On Wianamatta Shale in the Mandemar area west of Mittagong remnants of woodland with *Eucalyptus cinerea, Eucalyptus globoidea, Eucalyptus punctata* and *Eucalyptus mannifera* occur on low hills. Remnant trees of *Eucalyptus tereticornis* and *Eucalyptus viminalis* are found on shale soils on hillslopes. The understorey would have been of native grasses and herbs with scattered shrubs. Species still persisting include *Themeda australis, Microlaena stipoides, Dantonia, Stipa , Aristida, Hardenbergia violacea* and *Bursaria spinosa.* This community is on drier country than that above, *Eucalyptus cinerea* for example is mostly found in drier country further west (such as map unit 10pw, Porphyry Woodland).

Most of this area has now been cleared of native vegetation and only small pockets of vegetation remain along roadsides, and in paddock corners where grazing has removed most of the groundcover species. Fibrous-barked trees such as the stringybarks, *Eucalyptus globoidea*, are frequently killed by ringbarking by stock seeking fibrous material.

Map unit 10z
Mittagong Sandstone Woodland

i) Woodland: *Eucalyptus sieberi – Eucalyptus piperita – Eucalyptus sclerophylla*

Mittagong Sandstone Woodland occurs on sandy, shallow, well-drained soils derived from Hawkesbury Sandstone, between 700 and 800m elevation. It is widespread on the Southern Highlands occurring from Mittagong west to Mount Wanganderry and Joadja on the Burragorang 1:100 000 sheet, and south to Wingello and Bundanoon on the Moss Vale map sheet.

The characteristic vegetation of the sandstone plateaus are woodlands with trees of *Eucalyptus sieberi, Eucalyptus piperita, Eucalyptus radiata* subsp. *radiata* and *Eucalyptus sclerophylla.* Other species, *Eucalyptus agglomerata* and *Eucalyptus globoidea* may be present, to varying degrees, depending on aspect, slope and soil depth. *Eucalyptus sieberi* and *Eucalyptus globoidea* occur most commonly on ridges, *Eucalyptus piperita* and *Eucalyptus agglomerata* on slopes and more sheltered sites and *Eucalyptus sclerophylla* on poorly-drained sites or those with shallow soils. *Eucalyptus mannifera* and *Eucalyptus elata* occur along drainage lines. *Eucalyptus dives, Eucalyptus rubida* and *Eucalyptus mannifera* occur at colder sites.

Common understorey species include *Banksia spinulosa* var. *spinulosa, Hakea dactyloides, Xylomelum pyriforme, Leptospermum trinervium, Persoonia lanceolata* and *Bossiaea obcordata. Hakea constablei*, previously thought to have been restricted to Mount Wilson and the Wollangambe River area occurs on the Wanganderry Tableland at Bonnum Pic.

Figure 15. Upper Gibbergunyah Creek with open-forest of *Eucalyptus radiata, Eucalyptus smithii* and *Eucalyptus viminalis* (map unit 10z).

ii) Open-forest: *Eucalyptus smithii – Eucalyptus cypellocarpa – Eucalyptus elata*

This is confined to sheltered gullies in the uppermost reaches of Joadja Creek and Nattai River (and also in gullies near Mount Savage on the Boyd Range), on sheltered slopes below the sandstone escarpment. The deep soils are derived from Hawkesbury Sandstone. Canopy species include *Eucalyptus smithii, Eucalyptus cypellocarpa, Eucalyptus elata* and *Eucalyptus globoidea*. Common understorey species include *Lomatia myricoides, Lasiopetalum ferrugineum, Acacia falcata* and *Pomaderris ferruginea*.

Mittagong Sandstone Woodland intergrades to the north with Sydney Sandstone Complex of the Nattai Tableland. Species common to both units include *Eucalyptus piperita, Eucalyptus sieberi, Banksia spinulosa* var. *spinulosa, Hakea dactyloides, Persoonia lanceolata* and *Leptospermum trinervium*. It is also floristically similar to Blue Mountains Sandstone Plateau Forest in the Upper Blue Mountains. Very little work has been done on altitudinal gradients in the Hawkesbury Sandstone vegetation.

Map unit 15z
Wingecarribee Mallee

Low open-woodland: *Eucalyptus apiculata*

Mallees of *Eucalyptus apiculata* up to 4 m high, and small trees of *Eucalyptus mannifera*, occur on shallow skeletal soils associated with exposed Hawkesbury Sandstone outcrops along ridges overlooking the Wingecarribee River west of Medway, west of Wanganderry and small areas southeast of Burragorang Lookout. The 2 m high shrub layer includes *Hakea dactyloides, Leptospermum trinervium, Leptospermum polygalifolium, Calytrix tetragona* and *Lomandra longifolia*. Part of this rocky sandstone country immediately west of Berrima, was a favoured collecting place for the nineteenth century botanist Louisa Atkinson. Here in the 1870s, she described 'the wild grandeur of the Wallaby Rocks' with its 'curious rocks fretted by atmospherical aid into castellated forms' and 'destitute of large trees, but matted by a dwarf casuarina of a russet suit, while numerous lovely flowering shrubs add variety and beauty' (Atkinson 1980).

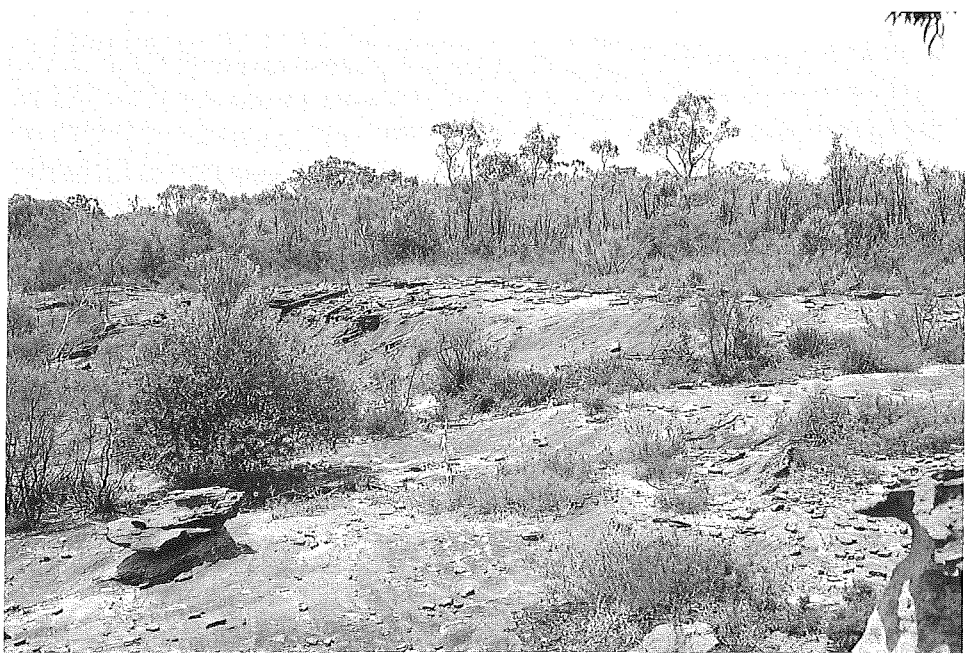

Figure 16. Wallaby Rocks near Berrima in 1982 showing exposed sandstone rockplatform with low open woodland in background (Wingecarribee Mallee, map unit 15z).

In 1982 *Allocasuarina nana* still grew in bands with *Banksia spinulosa, Kunzea parvifolia* and *Calytrix tetragona* at Wallaby Rocks, before the construction of the Motorway bypassing Berrima.

Eucalyptus apiculata is a nationally rare species that occurs sporadically on the Woronora Plateau as far east as O'Hares Creek (Keith 1994). The populations here are at the western limit for the species.

Map unit 17a
Teatree Scrub

Open-scrub: *Leptospermum polygalifolium – Eucalyptus mannifera*

Teatree Scrub occurs at Random Swamp, a soak on the Shoalhaven Group sandstones of Tomat Heights, on the Bindook Highlands, and at Sandy Flat. It consists of an open-scrub canopy of *Leptospermum polygalifolium* with emergent stunted trees of *Eucalyptus mannifera*. Other shrub species include *Leptospermum trinervium, Banksia spinulosa* and *Hakea dactyloides*. Groundcover species include *Epacris microphylla, Lepyrodia scariosa, Lomandra multiflora* and *Stellaria flaccida*.

Random Swamp Scrub is similar to Black Range Scrub on the Katoomba 1:100 000 vegetation sheet (Keith & Benson 1988), although the latter community has *Leptospermum myrtifolium* as its dominant scrub species.

Map unit 17m
Range Mallee

Open-scrub: *Eucalyptus stricta – Eucalyptus pauciflora*

Restricted to the Loombah Plateau on the Great Dividing Range at 1160 m elevation, Range Mallee is characterised by dense, 3–5 m high, stands of the mallee, *Eucalyptus stricta* with occasional emergent trees of *Eucalyptus pauciflora*. Predominant shrub species include *Banksia marginata, Leptospermum obovatum, Leptospermum myrtifolium, Leptospermum juniperinum* and *Hakea dactyloides*. Other less common shrubs include *Hibbertia serpyllifolia* and *Leucopogon microphyllus*. The nationally rare plant *Kunzea cambagei* occurs here.

Range Mallee differs from the Montane Heath and Open-heath that include *Eucalyptus stricta* further north (map units 21c and 21f in Keith & Benson 1988). Range Mallee has a taller structure (open-scrub compared with open-heath), lacks *Allocasuarina nana* in the shrub layer, and occurs on Silurian sediments, rather than Permian and Triassic sandstones.

Map unit 21c
Montane Heath

i) *Open-heath: Eucalyptus stricta – Allocasuarina nana – Hakea dactyloides – Leptospermum trinervium*

Montane Heath occurs on Kanangra Tops in the far north-western section of the map, where it is restricted to high-altitude (>1000 m) Permian and Triassic sediments. It extends onto the Katoomba sheet (Keith & Benson 1988). Blue Mountains Mallee, *Eucalyptus stricta*, forms an emergent layer with taller shrubs, *Hakea dactyloides* and *Leptospermum trinervium*, above a denser low shrub layer with *Allocasuarina nana, Epacris microphylla, Isopogon anemonifolius, Banksia ericifolia, Micromyrtus ciliata* and *Baeckea brevifolia*. Groundcover species include *Stylidium lineare, Carex appressa, Lepidosperma laterale, Gonocarpus teucrioides, Lindsaea linearis, Ptilothrix deusta, Drosera peltata* and *Drosera spatulata*.

ii) Open-heath: *Dracophyllum secundum – Epacris calvertiana – Gleichenia rupestris*

Patches of open-heath occur on moist cliff faces of the Permian and Triassic sandstone, containing *Dracophyllum secundum, Epacris calvertiana* and *Gleichenia rupestris*.

Map unit 26b
Boyd Plateau Bogs

Closed-sedgeland/closed-heath/open-heath: *Carex appressa – Carex gaudichaudiana – Restio australis*

This diverse vegetation unit, previously described by Keith and Benson (1988) and Steenbeeke (1990), occurs in headwater valleys on the Boyd Plateau at altitudes above 1100 m. Various forms

grow in shallow sinks and depressions on soils derived from granite and quartzite parent material and contain large amounts of *in situ* organic material. Vegetation patterns in the Boyd swamps appears to relate to waterlogging regimes, but are probably also related to fire and grazing (Keith & Benson 1988).

Closed sedgelands include *Carex appressa, Carex gaudichaudiana, Juncus holoschoenus, Restio australis, Patersonia fragilis* and *Geranium neglectum*, with occasional shrubs of *Epacris paludosa, Hakea microcarpa* and *Baeckea utilis*. Occasional thickets of *Leptospermum myrtifolium, Leptospermum obovatum* and *Callistemon sieberi* were noted by Keith and Benson (1988).

The presence of species, such as *Celmisia* sp. aff. *longifolia, Wahlenbergia ceracea* and *Sphagnum* sp., indicates that the Boyd swamps have a floristic affinity with the alpine and subalpine bogs of the Southern Tablelands.

Discussion

The Burragorang 1:100 000 vegetation map sheet depicts a diverse array of vegetation communities that relate to the complex geological history and landform processes of the area. The Burragorang sheet area extends from the low coastal tableland regions inland to the higher elevations of the Southern Blue Mountains and south to the Southern Highlands. Habitats range from deep gorges and escarpments through to undulating dry hills and high elevated plateaus, to the rugged terrain typical of the Hawkesbury Sandstone. Over this area, different altitude and rainfall classes contribute significantly to the floristic composition, located on the boundaries between the botanical subdivisions of the Central Coast and Central Tablelands.

In his survey of the Burragorang Valley, Cambage (1911) noted the influence that geology and altitude have on vegetation pattern:

'In the eastern [lower] portion [of the Burragorang area] coastal forms [of vegetation] are noticed, but many of these are gradually left behind as the ascent is made [heading west up the mountains] and cooler regions are reached, their places being taken by types better adapted to withstand the more rigid climatic conditions, and whose homes are on the highest parts of eastern Australia. ... As the vegetation is so often regulated by geological formations, [he describes] the various formations ... in order that the changes in the flora be better understood.'

Variation in plant communities and floristic composition is largely dependent upon geology, topography and rainfall. Groups of plant communities are associated with the igneous complexes — the Bindook porphyry Complex (map unit 10pw); and with the sedimentary forms — the Permian and Triassic sandstone geologies (map units 10ag, 10ar, 10p, 10z, 10q, 10w and 9w). Other communities found on specific geological types include Robertson Basalt Forest (map unit 6k), restricted to basalt outcrops around Robertson and Bowral; Moist Basalt Forest (map unit 6g) restricted to basalt caps at Mt Colong and Mt Shivering; River Oak Forest (map unit 9x), restricted to Quaternary alluvial flats; and the Tertiary igneous outcrops of Mount Gibraltar and Mount Jellore (map unit 9y).

Exceptions occur where other physical attributes, such as aspect, altitude and rainfall differences, over-ride the influence of geology. For example, groups of communities

on similar soils, geology and geomorphology may change progressively (in terms of structure and species composition) to form altitudinal series in response to variation in precipitation and temperature over the altitudinal range of the study area. The sandstone plateau communities (map units 10ar–10z–9i) exemplify the influence of a progressively cooler climate on a vegetation community which is similar in all of its other components. Similarly, Burrragorang Ironbark Woodland (map unit 10q), on the Shoalhaven Group sediments, ranges in altitude from 200 m to 500 m; and Joadja Stringybark Woodland (map unit 10w), also on the Shoalhaven Group sediments further south, occurs at higher altitudes (500–730 m a.s.l.) but is composed of different species. Burragorang Ironbark Woodland (map unit 10q) and Kowmung Wilderness Complex (map unit 10p) are two complex communities which although occur on different geological formations and different landforms, have similar suites of species. It is probable that the influence of a cooler climate is the determining physical factor in this case.

In regional terms the vegetation of the sandstone plateaus is part of Beadle's (1981) Eucalyptus woodlands and forests of low fertility on the eastern coastal lowlands, in particular the *Eucalyptus gummifera – Eucalyptus racemosa – Eucalyptus sieberi* Alliance (*Eucalyptus sclerophylla* is equivalent to *Eucalyptus racemosa* in the Burragorang area). The higher elevation communities of the Mittagong–Bowral and Boyd Plateau are part of the Eucalyptus communities of cooler climates of the Eastern Highlands including parts of the *Eucalyptus pauciflora* Alliance, *Eucalyptus radiata* Alliance and *Eucalyptus cypellocarpa – Eucalyptus muelleriana – Eucalyptus maidenii* Alliance. The woodlands of the Wollondilly valley are part of the Box Woodlands of the east and southeast, in particular the *Eucalyptus melliodora – Eucalyptus blakelyi* Alliance and the *Eucalyptus albens* Alliance.

Conservation

The Burragorang map sheet covers an important part of the major natural area that extends from the Wollemi National Park in the north through the Blue Mountains, Burragorang, Woronora Plateau and Shoalhaven area to Ettrema and the Budawangs in the south. Much of the natural vegetation on the Burragorang map is protected in conservation reserves especially for the northern half where there are three National Parks, each of considerable size, Blue Mountains, Kanangra–Boyd and Nattai. Kanangra–Boyd National Park (39 748ha) and the surrounding area makes up the third largest wilderness area in N.S.W. (146 000 ha), 'one of the most scenic and geologically complex wilderness areas in the state' (James 1994). This wilderness has been referred to as the 'cradle of the Australian bushwalking movement' (Muir 1992 in James 1994). Nattai National Park and Burragorang, Yerranderie and Nattai State Recreation Areas further south, were declared in December 1991. Nattai National Park and surrounding areas make up the Nattai Wilderness area (30 424 ha). It has spectacular gorge terrain, tall-open forests and rainforest elements and is an important part of the Warragamba Dam catchment.

Many of the 33 map units and plant communities recognised on the Burragorang map are well conserved. Of these, seven units account for most of the area covered by the three National Parks: 10q, 10bh, 10p, 10r in Blue Mountains National Park; 9n, 10p, 10r in Kanangra–Boyd National Park; and 10ag, 10ar in Nattai National Park. Moist Basalt Cap rainforest (map unit 6g) has only two small occurrences and both are within Blue Mountains National Park. There are other occurrences further north on the Katoomba map sheet. Kowmung Dry Rainforest (map unit 8d), occurring only in the Kowmung Valley, is protected within the boundaries of Kanangra–Boyd National Park. Kowmung Wilderness Complex (map unit 10p), confined to the Kowmung Valley, accounts for a large area of the Kanangra–Boyd National Park.

Blue Mountains Sandstone Forest (map unit 9i), Montane Moist Forest (map unit 9n), Sandstone Residual woodland (map unit 10r) and Montane woodland (map unit 10s) are all restricted to the higher altitudes of the north-western section of the map area and are all represented in both Blue Mountains and Kanangra–Boyd National Parks. Map units 9n, 10r and 10s account for a large amount of area conserved in Kanangra–Boyd National Park. The low-elevation Sydney Sandstone Communities (map units 10ag and 10ar) are well-conserved in the Burragorang area within Nattai National Park. Mittagong Sandstone Woodland (map unit 10z) has suffered from large amounts of clearing but now has its northern-most parts protected within Nattai National Park. Escarpment Slope Forests (map units 6hm and 6hd), limited to the foot of Triassic Sandstone escarpments, are included within the Kanangra–Boyd and Nattai National Parks. River Oak Forest (map unit 9x) has been reserved in the Kanangra–Boyd and Blue Mountains National Parks and, more recently, along the Wollondilly River in Nattai National Park. Although accounting for a large portion of Blue Mountains National Park and recently included within the boundaries of Nattai National Park, the original extent of Burragorang Ironbark Woodland (map unit 10q) was reduced following the formation of Lake Burragorang.

Significant communities in the Burragorang area include Douglas Scarp Woodland (map unit 10dw). This differs from similar woodlands elsewhere owing to the combined presence of *Callitris endlicheri* and *Acacia binervia.* A significant proportion is within Nattai National Park, along with the outlying *Angophora costata* woodlands in the Wanganderry Lookout area.

Porphyry Box Woodland (map unit 10pw), once covering a large part of the western half of the map area, has been largely cleared owing to the suitability of its deep loamy soils for agriculture. Considerable areas of the northern part of map unit 10pw are conserved in Yerranderie State Recreation area and much of that is in various states of regeneration following cessation of grazing.

Land clearing and development of land for rural subdivisions remain as threats to native vegetation on private land in the map area. Native vegetation along the Lake Burragorang foreshores may be threatened by proposals to raise Warragamba Dam for flood mitigation or increasing water storage. Inundation for long periods would affect five communities, map units 9x, 10dw, 10pw, 10q, 12b and Burragorang valley populations of the rare plants *Hakea* sp B, *Cryptandra buxifolia, Rulingia pannosa,*

Figure 17. Eucalypt regeneration around isolated remnant trees following cessation of grazing. The ring of sapling growth indicates the relatively short distance that seed is shed from the parent tree (Porphyry Woodland, map unit 10pw).

Gonocarpus longifolius and *Grevillea longifolia*. Extensive cliff collapses associated with underground coalmining may also endanger species of particular habitats, such as at the base of clifflines.

In the southern half of the map area the reserve system is much more limited and protection of the isolated remnants is inadequate. Mittagong Sandstone Woodland (map unit 10z) is generally poorly conserved, with some limited areas within Nattai National Park. Joadja Stringybark Woodland (map unit 10w), limited to the upper reaches of the Wingecarribee Valley, has remained relatively undisturbed, its steep terrain making it unsuitable for agriculture, however no part of this community has reserve status. Some of the communities on igneous outcrops (map unit 9y) such as at Mount Flora have been cleared, but the particularly important remnant on Mount Gibraltar is in a council reserve. Mount Jellore is part of Nattai National Park.

Robertson Basalt Woodland (map unit 6k) and Southern Highlands Shale Woodland communities (map unit 10x) have been extensively cleared for agriculture because of the arable soils on the basalt and the Wianamatta Shale. These communities are not included within any reserves on the Burragorang map. Remnants persist as small, isolated fragments along roadsides or in paddocks where grazing has removed most of the groundcover species. Remnant fibrous-barked trees such as the stringybarks, *Eucalyptus globoidea*, are frequently killed by ringbarking by stock seeking fibrous material. Protection of remnant trees and native understorey in rural areas is an important conservation issue.

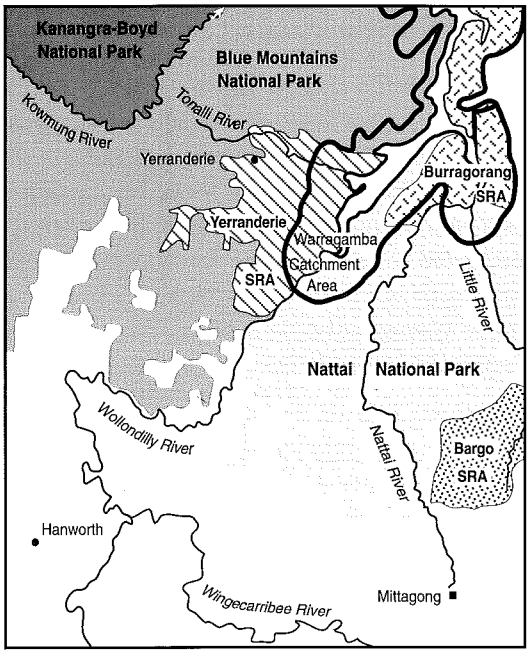

Figure 18. Major conservation reserves within the Burragorang 1:100 000 map sheet. The inner catchment of Warragamba Dam is shown as a thick line.

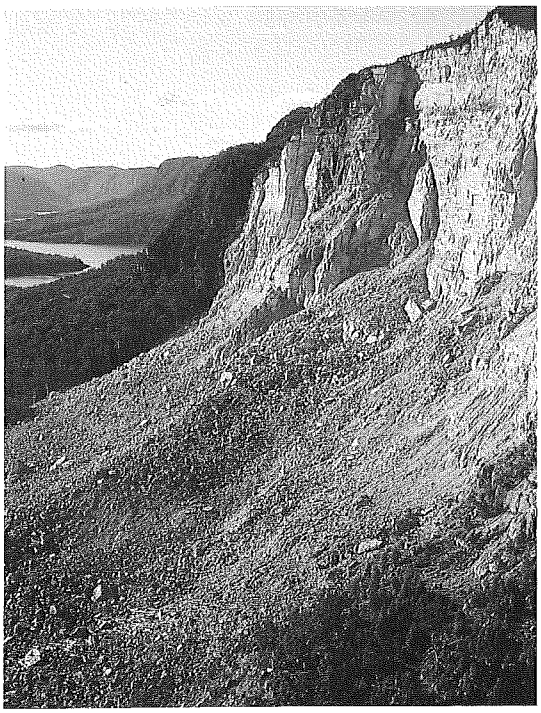

Figure 19. Cliff collapse near Lake Burragorang.

Rare or threatened plant species

Thirty-one botanically significant species are listed for the Burragorang map sheet (Table 4). These species are either rare, threatened or significant in terms of their geographic distribution. The species vary in terms of rarity and conservation status throughout the study area. There are several locally restricted species. For example *Bossiaea oligosperma* is a poorly-known vulnerable locally endemic species, as is *Kunzea cambagei*, which is restricted to high-altitude sandstone outcrops, such as Loombah Plateau; *Acacia clunies–rossiae* is a locally endemic species found along the Kowmung River. Proposals to raise Warragamba Dam populations of the rare plants including the only-recently discovered *Hakea* sp B.

Large areas of the northern half of the study area are within the National Park system and many of the rare or threatened species recognised are within National Park boundaries. Other species are in the State Recreation Areas but a large part is not open to the public as it is Sydney Water Catchment Area. A number of species occurring in the southern half of the study area are at risk because of clearing and grazing. Very little land is preserved within National Park here and native habitat is most often reduced to scattered clumps or narrow ribbons in roadside reserves.

Figure 20. *Eucalyptus oreades* on rocky slopes above the Nattai River, near the southern limit of its geographical distribution.

Table 4. Species of particular conservation significance within the Burragorang 1:100 000 map sheet area.

Species listed here are either rare or threatened or of regional botanical significance in terms of geographic distribution or localised populations disjunct from other occurrences. Localities refer to Burragorang map sheet occurrences. Codes are from Briggs & Leigh (1988, with current revised ROTAP lists).

Family and species	Habitat and Locality	Significance and conservation status
DICOTYLEDONS		
ASTERACEAE		
Helichrysum calvertianum	Restricted to small areas in eucalypt woodland near Mittagong, Berrima, Joadja and Fitzroy Falls; sandy soil, rainfall above 900mm pa	2KC-
BORAGINACEAE		
Halgania brachyrhyncha	The Sheepwalk, Burragorang	Rare, only Sydney area record
CONVOLVULACEAE		
Evolvulus alsinoides var. *decumbens*	The Sheepwalk, Burragorang	Rare, only Sydney area record
EPACRIDACEAE		
Lissanthe sapida	Open-woodland, Burragorang	3RCa
Rupicola sprengelioides	Mountain cliffs, Burragorang	3RC-t
Styphelia angustifolia	Lookout Hilltop (1923)	Rare, no recent records
FABACEAE		
Acacia clunies-rossiae	Yerranderie, Kowmung River	2RC-t
Acacia flocktoniae	Dry sclerophyll forests on sandstone, Yerranderie	2VC-
Acacia jonesii	Dry ridges, Yerranderie	2RCa
Bossiaea oligosperma	sandstone, Tonalli River, Yerranderie	2V
Phyllota humifusa	Jellore	2VCa
HALORAGACEAE		
Gonocarpus longifolius	Burragorang Valley	3RC-
LAMIACEAE		
Prostanthera rugosa	Wingecarribee River	Local endemic
MYOPORACEAE		
Myoporum floribundum	Kowmung area	3RCi, local pop. rare
MYRSINACEAE		
Ardisia bakeri	Rainforest, Lannigans Creek	2RC-
MYRTACEAE		
Darwinia fascicularis subsp. *oligantha*	Bonnum Pic area	Local disjunct population, southern limit
Eucalyptus aggregata	Black Springs Creek, Mittagong, Yerranderie	Local pop.
Eucalyptus apiculata	Mittagong/Berrima, Burragorang Lookout	2R

Family and species	Habitat and Locality	Significance and conservation status
MYRTACEAE (continued)		
Eucalyptus hypostomatica	Nattai River, Lacys Creek	3RC-
Eucalyptus macarthurii	Nattai River, Mittagong, Berrima, Bowral	2RCi
Eucalyptus oreades	Gibbergunyah Creek, Mittagong	local pop., southern limit
Kunzea cambagei	Loombah Plateau	2VCa
PROTEACEAE		
Banksia conferta var. *penicillata*	Hilltop	3RC-
Grevillea longifolia	Burragorang area	2RC-
Hakea constablei	Rocky outcrops, Bonnum Pic area	2RCa
Hakea sp. B	Kowmung River, Tonalli Cove	2VCi
Persoonia acerosa	Heath and dry sclerophyll forest on sandstone north of Hilltop	2VC-
Persoonia glaucescens	Hilltop, Mount Jellore, Boxvale Tramway, Berrima	2V
RHAMNACEAE		
Cryptandra buxifolia	Burragorang area	Disjunct population
Pomaderris cotoneaster	High altitudes, south of Mittagong	3ECi
Pomaderris sericea	Berrima	3VCi
RUTACEAE		
Asterolasia astericophora	Wingecarribee River, Belanglo State Forest	Local disjunct population
STERCULIACEAE		
Rulingia dasyphylla	Yerranderie, Burragorang	Disjunct population
MONOCOTYLEDONS		
ORCHIDACEAE		
Diuris aequalis	Sclerophyll forest on ranges and tablelands	3VC-
Pterostylis pulchella	Rainforest, below falls	2VC-

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APPENDIX A: Native species for communities on the Burragorang 1:100 000 map sheet

(Key to communities is in Table 3.)

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
FILICOPSIDA																														
Adiantaceae																														
Adiantum aethiopicum			6hm		8d			9to			9y								10pw	10q					10z					
Adiantum formosum			6hm		8d																									
Adiantum hispidulum			6hm		8d																									
Aspleniaceae																														
Asplenium australasicum		6hd	6hm		8d																									
Asplenium flabellifolium		6hd	6hm	6k	8d		9n				9y									10q	10r	10s			10z					
Asplenium flaccidum								9to																						
Blechnaceae																														
Blechnum ambiguum																				10q										
Blechnum cartilagineum	6g	6hd	6hm				9n				9y			10bh					10pw	10q								17m		
Blechnum minus																						10s								
Blechnum nudum							9n		9w																10z					
Blechnum wattsii							9n														10r	10s								
Doodia aspera	6g	6hd	6hm		8d		9n													10q										
Cyatheaceae																														
Cyathea australis			6hm		8d																									
Davalliaceae																														
Arthropteris tenella					8d																									
Davallia pyxidata		6hd	6hm																	10q										
Dennstaedtiaceae																														
Histiopteris incisa			6hm																											
Pteridium esculentum		6hd	6hm	6k		9i		9to	9w	9x	9y	10ag	10ar	10bh		10l		10p	10pw	10q	10r	10s	10w	10x	10z			17m		
Dicksoniaceae																														
Calochlaena dubia		6hd	6hm				9n							10bh				10p	10pw						10z			17m		
Dryopteridaceae																														
Lastreopsis microsora			6hm		8d																									
Polystichum australiense		6hd	6hm																											
Polystichum formosum		6hd	6hm																											
Polystichum proliferum		6hd	6hm		8d		9n																							
Gleicheniaceae																														
Gleichenia dicarpa			6hm																											

Communities / Species	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Gleichenia microphylla															10dw										10z				21c	26b
Gleichenia rupestris			6hm																						10z				21c	
Sticherus flabellatus																														
Lindsaeaceae			6hm																										21c	
Lindsaea linearis			6hm				9n					10ag	10ar					10p	10pw						10z					
Lindsaea microphylla																														
Osmundaceae			6hm																						10z					
Todea barbara																														
Polypodiaceae			6hm																											
Microsorum scandens			6hm	6k	8d		9n											10p		10q										
Pyrrosia rupestris																														
Sinopteridaceae																														
Cheilanthes austrotenuifolia		6hd						9to																						
Cheilanthes distans			6hm				9n												10pw	10q										
Cheilanthes sieberi																		10p												
subsp. *sieberi*		6hd	6hm				9n		9w		9y				10dw			10p	10pw	10q					10z	15z				
Cheilanthes tenuifolia			6hm																											
Pellaea falcata		6hd	6hm	6k	8d		9n											10p	10pw											
CONIFEROPSIDA																														
Cupressaceae																														
Callitris endlicheri															10dw				10pw	10q						15z				
Callitris muelleri																										15z				
Callitris rhomboidea																														
Podocarpaceae																														
Podocarpus spinulosus			6hm																											
CYCADOPSIDA																														
Zamiaceae																														
Macrozamia communis																				10q										
MAGNOLIOPSIDA																														
Dicotyledons																														
Acanthaceae																														
Brunoniella australis		6hd													10dw				10pw	10q										
Brunoniella pumilio			6hm																10pw	10q										

Amaranthaceae																									
Deeringia amaranthoides			6hm		8d																				
Nyssanthes erecta			6hm				9n										10p								
Anthericaceae																									
Arthropodium milleflorum					8d		9n										10p		10q						
Laxmannia gracilis																			10q						
Apiaceae																									
Actinotus helianthi																			10q				10z		
Centella asiatica		6hd	6hm																10q						
Daucus glochidiatus															10dw										
Hydrocotyle algida		6hd																10pw							
Hydrocotyle geraniifolia		6hd	6hm				9n		9w	9x							10p	10pw	10q						
Hydrocotyle laxiflora		6hd	6hm				9n		9w	9x	9y						10p	10pw	10q						
Hydrocotyle peduncularis			6hm				9n		9w	9x									10q						
Oreomyrrhis eriopoda											9y														
Platysace ericoides		6hd	6hm									10ag	10ar				10p		10q	10r			10z	15z	
Platysace lanceolata							9n				9y						10p			10r			10z	15z	
Platysace linearifolia		6hd	6hm									10ag											10z		
Xanthosia pilosa		6hd	6hm			9i													10q				10z		
Xanthosia tridentata						9i						10ag					10p		10q						
Apocynaceae																									
Parsonsia brownii				6k																					
Parsonsia sp. A					8d		9n																		
Parsonsia straminea		6hd	6hm	6k	8d		9n								10dw										
Araliaceae																									
Astrotricha latifolia		6hd	6hm				9n												10q						
Astrotricha ledifolia												10ag													
Astrotricha longifolia			6hm																						
Polyscias elegans			6hm																						
Polyscias sambucifolia	6g	6hd	6hm	6k			9n		9w		9y					10l	10p	10pw	10q				10z		
Asclepiadaceae																									
Marsdenia flavescens			6hm		8d		9n			9x															
Marsdenia rostrata				6k	8d													10pw							
Marsdenia suaveolens		6hd																	10q				10z		
Tylophora barbata		6hd	6hm	6k	8d		9n				9y						10p	10pw	10q				10z		
Asteraceae																									
Arrhenechthites mixta																		10pw							
Brachycome angustifolia			6hm															10pw	10q			10x			
Brachycome graminea																			10q						

Communities / Species	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Brachycome multifida																				10q										
Brachycome obovata																			10pw											
Brachycome rigidula								9to																						
Bracteantha bracteatum							9n	9to		9x	9y							10p		10q										
Bracteantha viscosa								9to																						
Calotis cuneifolia							9n																							
Cassinia aculeata			6hm				9n		9w	9x	9y				10dw			10p		10q										
Cassinia arcuata		6hd						9to	9w											10q				10x	10z					
Cassinia aureonitens									9w											10q					10z					
Cassinia cunninghamii																				10q	10r				10z					
Cassinia denticulata													10ar							10q			10w							
Cassinia longifolia		6hd	6hm		8d		9n								10dw					10q										
Cassinia quinquefaria				6k	8d		9n																	10x						
Cassinia trinerva																				10q				10x						
Cassinia uncata		6hd						9to	9w	9x									10pw	10q										
Centipeda minima							9n									10l				10q	10r	10s								
Chrysocephalum apiculatum							9n													10q										
Cotula australis																				10q										
Craspedia sp.									9w											10q										
Cymbonotus lawsonianus							9n													10q										
Glossogyne tannensis																									10z					
Gnaphalium sphaericum		6hd																							10z					
Helichrysum adenophorum var. *waddelliae*			6hm						9w		9y									10q					10z					
Helichrysum collinum								9to												10q										
Helichrysum diosmifolium		6hd	6hm				9n		9w		9y									10q					10z					
Helichrysum elatum																				10q					10z					
Helichrysum rutidolepis																				10q					10z					
Helichrysum scorpioides																				10q										
Helichrysum sp.																														
Lagenifera gracilis		6hd	6hm						9w				10ar						10pw	10q					10z					
Leptinella longipes							9n			9x									10pw											
Olearia argophylla																		10p			10r									
Olearia erubescens											9y		10ar							10q										
Olearia microphylla																				10q	10r			10x	10z					

Olearia myrsinoides																			10z	
Olearia ramulosa	6hd														10q					
Olearia tomentosa	6hd																			
Olearia viscidula	6hd	6hm				9to	9w	9x	9y		10dw			10pw	10q			10x	10z	15z
Olearia viscosa					9n								10p							
Ozothamnus diosmifolius	6hd	6hm					9w								10q					
Picris hieracioides					9n								10p							
Podolepis hieracioides							9w					10l	10p				10s			
Podolepis jaceoides													10p		10q		10s			
Pseudognaphalium luteoalbum							9x							10q						
Senecio apargiaefolius					9n							10l	10p			10r				
Senecio biserratus												10l								
Senecio diaschides														10pw						
Senecio gunnii										10ar										
Senecio lautus					9n			9x					10p	10pw	10q	10r				
Senecio linearifolius	6hd	6hm	6k		9n		9w	9x	9y				10p			10r			10z	
Senecio macranthus					9n								10p							
Senecio minimus					9n								10p			10r			10z	
Senecio quadridentatus															10q					
Senecio vagus					9n								10p		10q	10r				
Solenogyne bellioides					9n			9x							10q					
Solenogyne gunnii									9y											
Vernonia cinerea		6hm			9n			9x					10p		10q					
Vittadinia cuneata sens. lat.							9w				10dw				10q					
Bignoniaceae																				
Pandorea pandorana	6hd	6hm	6k	8d	9n						10dw			10pw	10q					
Boraginaceae																				
Austrocynoglossum latifolium			6k																	
Cynoglossum australe								9x					10p		10q					
Cynoglossum suaveolens															10q					
Ehretia acuminata		6hm		8d	9n								10p							
Halgania brachyrhyncha															10q					
Brassicaceae																				
Capsella bursa-pastoris								9x					10p							
Cardamine hirsuta					9n			9x					10p							
Sisymbrium irio											10dw									
Callitrichaceae																				
Callitriche muelleri																				15z

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Campanulaceae																														
Wahlenbergia communis							9n				9y				10dw	10l		10p												
Wahlenbergia gracilis			6hm								9y							10p	10pw	10q										
Wahlenbergia graniticola							9n									10l		10p												
Wahlenbergia multicaulis							9n											10p												
Wahlenbergia stricta																		10p		10q										
Caprifoliaceae																														
Sambucus australasica				6k	8d		9n											10p												
Caryophyllaceae																														
Scleranthus biflorus																								10x						
Stellaria flaccida	6g	6hd	6hm	6k			9n			9x									10pw								17a			
Stellaria pungens	6g							9to	9w									10p	10pw						10z					
Casuarinaceae																														
Allocasuarina diminuta subsp. *mimica*									9w																					
Allocasuarina littoralis		6hd	6hm			9i			9w		9y				10dw			10p		10q				10x	10z					
Allocasuarina nana									9w																					
Allocasuarina paludosa																										15z			21c	
Allocasuarina torulosa		6hd	6hm				9n																	10x						
Allocasuarina verticillata																		10p		10q										
Casuarina cunninghamiana		6hd						9to		9x					10dw					10q										
Celastraceae																			10pw	10q										
Celastrus australis				6k	8d		9n																							
Chenopodiaceae																														
Chenopodium carinatum										9x								10p												
Einadia hastata							9n			9x	9y							10p		10q										
Einadia nutans							9n											10p												
Rhagodia baccata							9n											10p												
Clusiaceae																														
Hypericum gramineum																			10pw	10q					10z					
Hypericum japonicum							9n											10p		10q										
Convolvulaceae																														
Calystegia marginata																														
Dichondra repens	6g	6hd	6hm	6k			9n	9to	9w	9x	9y				10dw				10pw	10q				10x						
Crassulaceae																														
Crassula sieberiana			6hm				9n								10dw			10p	10pw	10q										

Cucurbitaceae																							
Sicyos australis							9x																
Cunoniaceae																							
Aphanopetalum resinosum	6hd	6hm	6k	8d	9n											10q							
Callicoma serratifolia		6hm					ie ag		10ar														
Ceratopetalum apetalum		6hm		8d	9n												10r	10s		10z			
Ceratopetalum gummiferum		6hm					ieag.									10q							
Schizomeria ovata		6hm																					
Dilleniaceae																							
Hibbertia acicularis		6hm				9to					10dw					10q					15z		
Hibbertia aspera		6hm												10pw		10q				10z			21c
Hibbertia dentata		6hm																					
Hibbertia diffusa		6hm									10dw					10q							
Hibbertia empetrifolia		6hm					9w		9y	10ag	10ar					10q				10z			21c
Hibbertia linearis													10p			10q				10z			
Hibbertia monogyna		6hm					9w			10ag						10q							
Hibbertia nitida		6hm																					
Hibbertia obtusifolia		6hm			9n		9w					10mr	10p	10pw		10q				10z			
Hibbertia pedunculata																10q							
Hibbertia riparia																10q							
Hibbertia scandens	6hd	6hm												10pw		10q				10z			
Hibbertia serpyllifolia														10pw								17m	21c
Hibbertia stricta						9to																	
Droseraceae																							
Drosera auriculata	6hd															10q							
Drosera peltata						9to										10q							21c
Drosera spatulata					9n		9x																21c
Elaeocarpaceae																							
Elaeocarpus reticulatus	6hd	6hm		8d	9n											10q				10z			
Epacridaceae																							
Acrotriche divaricata													10p										
Acrotriche serrulata																10q							
Astroloma humifusum	6hd	6hm					9w				10dw			10pw		10q							
Brachyloma daphnoides						9to	9w							10pw		10q				10z			21c
Dracophyllum secundum		6hm								10ar										10z			21c
Epacris calvertiana													10p				10r			10z			21c
Epacris longiflora																10q							21c
Epacris microphylla							9w													10z	15z	17a	21c
Epacris obtusifolia																				10z			

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Epacris pulchella												10ag	10ar								10r									
Epacris purpurascens																					10r								21c	
Leucopogon ericoides													10ar					10p	10pw	10q					10z	15z				
Leucopogon esquamatus							9n											10p												
Leucopogon fraseri																				10q										
Leucopogon juniperinus		6hd	6hm															10p	10pw	10q										
Leucopogon lanceolatus	6g	6hd						9to	9w		9y	10ag	10ar	10bh	10dw			10p	10pw		10r				10z			17m		
Leucopogon microphyllus								9to																				17m	21c	
Leucopogon muticus		6hd	6hm					9to							10dw					10q										
Leucopogon setiger							9n											10p		10q										
Lissanthe sapida			6hm																	10q										
Lissanthe strigosa			6hm					9to					10ar		10dw				10pw	10q				10x						
Melichrus erubescens								9to																						
Melichrus procumbens																				10q					10z					
Melichrus urceolatus									9w																					
Monotoca elliptica										9x								10p												
Monotoca scoparia													10ar					10p		10q					10z					
Rupicola sprengelioides													10ar																	
Styphelia tubiflora		6hd	6hm																											
Escalloniaceae																														
Abrophyllum ornans			6hm		8d		9n			9x											10r	10s								
Quintinia sieberi							9n													10q	10r	10s								
Euphorbiaceae																														
Amperea xiphoclada		6hd							9w			10ag				10l					10r	10s		10x	10z	15z				
Bertya rosmarinifolia										9x																				
Beyeria viscosa					8d		9n											10p												
Breynia oblongifolia		6hd	6hm		8d		9n		9w						10dw					10q										
Claoxylon australe			6hm		8d															10q										
Glochidion ferdinandi			6hm																											
Micrantheum ericoides																		10p		10q	10r									
Micrantheum hexandrum																				10q						15z				
Omalanthus populifolius			6hm																											
Omalanthus stillingifolius							9n											10p												
Phyllanthus gasstroemii		6hd					9n			9x								10p		10q										
Phyllanthus hirtellus		6hd	6hm						9w		9y	10ag	10ar		10dw					10q				10x	10z					
Poranthera corymbosa		6hd														10l		10p		10q	10r				10z					

Poranthera ericifolia													10l				10r					
Poranthera microphylla	6hd	6hm				9w		9y					10l		10p		10q	10r			10z	
Eupomatiaceae																						
Eupomatia laurina	6hd	6hm		8d																		
Fabaceae–Caesalpinioideae																						
Senna artemisioides																						
subsp. *filifolia*												10dw										
Senna odorata					9n			9x														
Fabaceae–Faboideae																						
Aotus ericoides																	10q					
Bossiaea buxifolia																	10q					
Bossiaea heterophylla		6hm			9n	9to				10ar					10p		10q				10z	15z
Bossiaea neo-anglica																	10q				10z	
Bossiaea obcordata		6hm							10ag	10ar										10x	10z	
Bossiaea oligosperma										10ar												
Bossiaea prostrata						9w		9y														
Bossiaea rhombifolia										10ar											10z	
Bossiaea scolopendria																	10q					
Daviesia acicularis									10ag	10ar		10dw					10q				10z	
Daviesia alata																					10z	
Daviesia corymbosa						9w															10z	
Daviesia latifolia																					10z	
Daviesia leptophylla						9to																
Daviesia mimosoides						9w											10q	10r	10w	10x		
Daviesia ulicifolia															10p		10q	10r				
Desmodium brachypodum					9n										10p	10pw	10q					
Desmodium rhytidophyllum	6hd				9n								10p			10q						
Desmodium varians	6hd	6hm	6k		9n			9y							10p	10pw	10q	10r				
Dillwynia brunioides																						15z
Dillwynia floribunda																	10q					
Dillwynia ramosissima																					10z	
Dillwynia retorta		6hm							10ag	10ar		10dw			10p		10q				10z	
Dillwynia sericea						9w									10p						10z	
Dillwynia sieberi																					10z	
Glycine clandestina	6hd	6hm			9n	9to		9y		10ar					10p	10pw	10q				10z	
Glycine microphylla	6hd	6hm														10pw	10q					
Glycine tabacina		6hm													10p		10q			10x		
Gompholobium grandiflorum								10ag	10ar											10z		
Gompholobium latifolium																	10q					

Communities / Species	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Gompholobium minus								9to																	10z					
Goodia lotifolia			6hm																											
Hardenbergia violacea		6hd						9to	9w		9y	10ag	10ar		10dw			10p		10q				10x	10z					
Hovea lanceolata						9i																								
Hovea linearis												10ag	10ar							10q					10z					
Hovea longifolia		6hd	6hm																						10z					
Hovea purpurea																									10z					
Indigofera australis		6hd	6hm				9n	9to										10p	10pw	10q					10z					
Jacksonia scoparia									9w											10q										
Kennedia rubicunda			6hm				9n													10q					10z					
Mirbelia oxylobioides									9w																10z					
Mirbelia platylobioides																									10z					
Mirbelia rubiifolia												10ag													10z					
Oxylobium alpestre																10l														
Oxylobium ellipticum		6hd	6hm					9to	9w		9y	10ag		10bh				10p		10q	10r			10x	10z			17m		
Oxylobium ilicifolium																													21c	
Phyllota squarrosa		6hd							9w										10pw					10x						
Platylobium formosum																									10z					
Pultenaea altissima			6hm										10ar							10q										
Pultenaea daphnoides													10ar												10z					
Pultenaea flexilis			6hm																	10q										
Pultenaea hispidula								9to												10q								21c		
Pultenaea linophylla																		10p		10q										
Pultenaea microphylla			6hm					9to										10p		10q	10r							21c		
Pultenaea retusa																				10q	10r									
Pultenaea scabra			6hm					9to												10q										
Pultenaea stipularis																														
Zornia dyctiocarpa																														
Fabaceae–Mimosoideae																														
Acacia amoena			6hm																	10q										
Acacia asparagoides																		10p		10q										
Acacia binervata																													21c	
Acacia binervia			6hm																						10z					
Acacia brownii															10dw	10l				10q		10s								
Acacia buxifolia								9to	9w											10q										
Acacia bynoeana								9to	9w											10q										
								9to																						

Acacia clunies-rossiae						9n												10p											
Acacia dealbata							9to										10l												
Acacia decora																				10q									
Acacia decurrens		6hd	6hm				9to	9w					10dw						10pw	10q			10w						
Acacia dorothea																		10p											21c
Acacia elata		6hd	6hm																										
Acacia elongata								9w												10q	10r				15z				
Acacia falcata								9w					10dw							10q					10z				
Acacia falciformis		6hd	6hm				9to	9w										10p		10q			10x	10z					
Acacia filicifolia									9x																				
Acacia fimbriata			6hm						9x				10dw						10pw	10q			10x						
Acacia floribunda			6hm			9n			9x			10bh						10p		10q							17m		
Acacia gunnii							9to																						
Acacia hispidula																				10q									
Acacia implexa			6hm		8d	9n												10p		10q									
Acacia jonesii																				10q									
Acacia kybeanensis																		10p		10q									
Acacia linearifolia											10ag	10ar																	
Acacia linifolia												10ar								10q									
Acacia longifolia			6hm					9w			10ag	10ar	10bh					10p	10pw	10q	10r		10x	10z			17m		
Acacia maidenii		6hd	6hm																	10q									
Acacia mearnsii				6k																			10x	10z					
Acacia melanoxylon	6g			6k		9n	9to	9w										10p						10z					
Acacia myrtifolia											10ag	10ar											10x	10z					
Acacia obliquinervia																	10l												
Acacia obtusifolia		6hd						9w	9x				10bh		10mr					10q	10r			10z			17m		
Acacia paradoxa							9to													10q									
Acacia parramattensis		6hd	6hm	6k		9n		9w	9x				10bh					10p		10q							17m		
Acacia penninervis			6hm																										
Acacia prominens			6hm																										
Acacia rubida								9w												10q				10z					
Acacia suaveolens											10ag	10ar												10z					
Acacia stricta										9y													10x						
Acacia terminalis			6hm				9to				10ag	10ar			10mr					10q				10z					
Acacia ulicifolia			6hm				9to				10ag	10ar	10dw			10p				10q			10x	10z					
Acacia uncinata													10dw							10q									
Geraniaceae																													
Geranium homeanum		6hd	6hm	6k																									
Geranium neglectum						9n														10q									

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Geranium potentilloides																				10q										
Geranium solanderi	6g	6hd	6hm				9n			9x			10ar			10l		10p	10pw			10s								
Pelargonium australe			6hm					9to																						
Pelargonum inodorum			6hm				9n			9x	9y										10r									
Goodeniaceae																														
Coopernookia barbata							9n																							
Dampiera purpurea			6hm				9n		9w			10ag	10ar					10p		10q	10r				10z					
Dampiera stricta																				10q	10r				10z					
Goodenia bellidifolia		6hd							9w				10ar			10l				10q	10r				10z				21c	
Goodenia hederacea			6hm				9n	9to	9w	9x			10ar		10dw			10p	10pw	10q	10r		10w	10x	10z				21c	
Goodenia heterophylla			6hm																											
Goodenia ovata		6hd	6hm				9n			9x										10q	10r			10x	10z					
Goodenia stelligera																				10q					10z					
Scaevola ramosissima						9i														10q	10r									
Haloragaceae																				10q	10r				10z					
Gonocarpus longifolius			6hm							9x																				
Gonocarpus micranthus												10ag																		
Gonocarpus tetragynus			6hm						9w	9x					10dw	10l				10q				10x	10z					
Gonocarpus teucrioides		6hd	6hm						9w			10ag	10ar			10l			10pw	10q	10r				10z				21c	
Haloragis serra																				10q										
Myriophyllum pedunculatum										9x																				
Hypericaceae																														
Hypericum gramineum																									10z					
Lamiaceae																														
Ajuga australis							9n	9to										10p		10q										
Mentha satureioides											9y																			
Plectranthus graveolens		6hd	6hm		8d										10dw					10q										
Plectranthus parviflorus		6hd	6hm				9n				9y							10p		10q					10z					
Prostanthera incana			6hm																	10q					10z					
Prostanthera incisa							9n											10p												
Prostanthera lasianthos			6hm						9w	9x															10z					
Prostanthera violacea			6hm																	10q					10z					
Teucrium corymbosum							9n											10p												
Westringia eremicola																									10z					
Lauraceae																														
Cassytha glabella			6hm										10ar							10q										

Cassytha pubescens			6hm			9n					10ar			10p							10z	15z		21c	
Cryptocarya glaucescens			6hm																						
Neolitsea dealbata			6hm																						
Lobeliaceae																									
Lobelia gracilis													10l												
Pratia purpurascens	6g	6hd	6hm		8d	9n	9w	9x	9y		10ar	10dw		10p	10pw	10q	10r								
Loganiaceae																									
Logania albiflora						9n			9y	10ag				10p		10q									
Mitrasacme polymorpha						9n				10ag					10pw						10z				
Loranthaceae																									
Amyema congener			6hm													10q									
Amyema miquelii															10pw	10q									
Amyema pendulum														10p		10q									
Dendrophthoe vitellina														10p											
Muellerina eucalyptoides						9n								10p		10q									
Lythraceae																									
Lythrum salicaria														10p											
Malvaceae																									
Abutilon oxycarpum			6hm		8d			9x						10p		10q									
Gynatrix pulchella						9n		9x						10p											
Hibiscus heterophyllus			6hm																						
Meliaceae																									
Synoum glandulosum			6hm		8d																				
Toona ciliata			6hm		8d	9n																			
Menispermaceae																									
Sarcopetalum harveyanum		6hd	6hm		8d																				
Stephania japonica var. *discolor*		6hd	6hm		8d	9n		9x				10dw		10p	10pw	10q									
Monimiaceae																									
Doryphora sassafras			6hm	6k	8d	9n											10r	10s							
Hedycarya angustifolia			6hm	6k	8d											10q									
Moraceae																									
Ficus coronata			6hm		8d	9n																			
Ficus rubiginosa			6hm		8d	9n										10q									
Maclura cochinchinensis					8d																				
Malaisia scandens															10pw										
Myoporaceae																									
Myoporum floribundum			6hm																						
Myoporum montanum						9n								10p	10pw	10q									

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																													
Myrsinaceae																													
Rapanea howittiana			6hm	6k	8d		9n											10p		10q									
Rapanea variabilis		6hd	6hm																	10q									
Myrtaceae																													
Acmena smithii		6hd	6hm		8d		9n																						
Angophora bakeri		6hd	6hm									10ag			10dw				10pw										
Angophora costata		6hd	6hm									10ag	10ar																
Angophora floribunda		6hd	6hm				9n			9x								10p	10pw	10q									
Backhousia myrtifolia		6hd	6hm		8d		9n											10p	10pw	10q									
Baeckea brevifolia																												21c	
Baeckea virgata			6hm				9n													10q									
Callistemon citrinus																									15z				
Callistemon linearis																									10z				
Callistemon rigidus																				10q									
Callistemon salignus										9x										10q									
Callistemon sieberi							9n									10l													26b
Calytrix tetragona																										15z			
Eucalyptus agglomerata								9to	9w				10ar					10p		10q			10w		10z				
Eucalyptus aggregata X *mannifera*																									10z				
Eucalyptus amplifolia subsp. *amplifolia*									9w															10x					
Eucalyptus apiculata																										15z			
Eucalyptus benthamii			6hm																										
Eucalyptus blakelyi								9to																					
Eucalyptus blaxlandii																		10p			10r								
Eucalyptus bosistoana																				10q									
Eucalyptus cinerea								9to	9w															10x					
Eucalyptus crebra		6hd	6hm												10dw			10p	10pw	10q	10r								
Eucalyptus cypellocarpa					8d		9n				9y			10bh				10p		10q	10r			10x					
Eucalyptus dalrympleana							9n		9w							10l		10p				10s							
Eucalyptus dealbata		6hd																											
Eucalyptus deanei		6hd	6hm				9n																						
Eucalyptus dives							9n	9to	9w							10l	10mr												
Eucalyptus elata			6hm	6k				9to	9w	9x													10w	10x	10z				
Eucalyptus eugenioides		6hd	6hm				9n		9w	9x				10bh				10p		10q			10w						

Eucalyptus eximia		6hd																													
Eucalyptus fastigata	6g			6k		9n							10bh				10p	10pw			10s			10z							
Eucalyptus fibrosa			6hm														10p		10q												
Eucalyptus globoidea					9i			9w			10ag												10x	10z							
Eucalyptus goniocalyx							9to											10pw													
Eucalyptus gummifera		6hd	6hm								10ag	10ar							10q					10z							
Eucalyptus hypostomatica			6hm																												
Eucalyptus macarthurii								9w																							
Eucalyptus macrorhyncha							9to																	10z							
Eucalyptus mannifera																															
subsp. *gullickii*							9to	9w								10mr								10z	15z	17a					
Eucalyptus melliodora						9n	9to										10p	10pw	10q												
Eucalyptus moluccana																		10pw	10q												
Eucalyptus moorei																															
Eucalyptus oreades	6g																														
Eucalyptus ovata								9w															10x								
Eucalyptus paniculata																	10p		10q												
Eucalyptus pauciflora								9w								10l					10s			10z			17m				
Eucalyptus pilularis			6hm																10q												
Eucalyptus piperita		6hd	6hm		9i			9w		9y	10ag	10ar							10q					10z							
Eucalyptus punctata		6hd	6hm			9n	9to	9w					10bh				10p	10pw	10q	10r			10x	10z							
Eucalyptus quadrangulata										9y									10q				10x								
Eucalyptus radiata				6k		9n		9w		9y			10bh			10mr		10pw					10x	10z							
Eucalyptus rossii							9to																								
Eucalyptus rubida																															
subsp. *rubida*																10l								10z							
Eucalyptus sclerophylla		6hd						9w				10ar											10x	10z	15z						
Eucalyptus sieberi							9to	9w				10ar	10bh			10mr				10r				10z		17a					
Eucalyptus smithii										9y														10z							
Eucalyptus sparsifolia								9w					10bh																		
Eucalyptus stellulata																								10z							
Eucalyptus stricta																											17m	21c			
Eucalyptus tereticornis		6hd	6hm	6k		9n				9y							10p	10pw	10q				10x								
Eucalyptus viminalis	6g			6k			9to	9w								10l								10z							
Kunzea ambigua									9x		10ag								10q												
Kunzea parvifolia								9w																10z	15z						
Leptospermum arachnoides								9w																10z	15z						
Leptospermum brevipes																												21c			
Leptospermum grandifolium								9w																							

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Leptospermum lanigerum																									10z					
Leptospermum juniperinum																												17m	21c	
Leptospermum myrtifolium																												17m		
Leptospermum obovatum									9w								10mr											17m		26b
Leptospermum parvifolium																				10q										
Leptospermum polygalifolium						9n		9w				10ar	10bh						10q	10r			10x	10z	15z	17a	17m			
Leptospermum trinervium																					10r				10z	15z	17a		21c	
Melaleuca erubescens																				10q										
Melaleuca hypericifolia											9y																			
Melaleuca linariifolia			6hm								9y									10q				10x	10z					
Melaleuca styphelioides		6hd	6hm							9x		10ag							10pw	10q										
Melaleuca thymifolia												10ar												10x						
Micromytrus ciliata																													21c	
Rhodamnia rubescens			6hm																											
Syncarpia glomulifera		6hd	6hm									10ar 10ag								10q										
Tristaniopsis laurina			6hm							9x										10q										
Olacaceae																														
Olax stricta																		10p												
Oleaceae																														
Notelaea longifolia		6hd	6hm		8d								10ar							10q					10z					
Notelaea neglecta							9n			9x								10p												
Notelaea ovata								9to												10q										
Notelaea venosa			6hm	6k	8d		9n																							
Onagraceae																														
Epilobium billardierianum			6hm				9n			9x					10dw				10pw	10q										
Epilobium pallidiflorum							9n													10q										
Oxalidaceae																														
Oxalis chnoodes		6hd																												
Passifloraceae																														
Passiflora cinnabarina							9n											10p												
Passiflora herbertiana		6hd	6hm		8d					9x									10pw											
Piperaceae																														
Piper novae-hollandiae			6hm		8d																									
Pittosporaceae																														
Billardiera scandens		6hd	6hm				9n		9w		9y									10q					10z					
Bursaria longisepala		6hd						9to												10q										

Bursaria spinosa		6hm				9to	9w				10bh	10dw		10p	10pw	10q		10x				17m							
Citriobatus pauciflorus	6hd	6hm	6k	8d	9n			9x																						
Pittosporum revolutum		6hm		8d	9n			9x						10p		10q														
Pittosporum undulatum	6hd	6hm	6k						9y	10ar						10q														
Plantaginaceae																														
Plantago debilis			6k				9w									10q														
Plantago gaudichaudii					9n																									
Plantago hispida					9n									10p		10q														
Polygalaceae																														
Comesperma ericinum																			10z											
Comesperma volubile																			10z											
Polygonaceae																														
Muehlenbeckia rhyticarya														10p																
Persicaria hydropiper																		10x												
Persicaria lapathifolia					9n			9x																						
Persicaria prostrata								9x																						
Rumex brownii								9x																						
Portulacaceae																														
Calandrinia calyptrata		6hm																												
Calandrinia pickeringii									9y																					
Proteaceae																														
Banksia cunninghamii subsp. *cunninghamii*														10p																
Banksia ericifolia																													21c	
Banksia marginata					9n		9w						10l						10z	15z		17m	21c							
Banksia oblongifolia																			10z											
Banksia paludosa																			10z											
Banksia serrata		6hm		9i						10ar	10bh								10z			17m							
Banksia spinulosa		6hm			9n		9w		10ag	10ar	10bh		10mr	10p		10q		10x	10z	15z	17a	17m							
Conospermum longifolium subsp. *longifolium*																			10z											
Conospermum longifolium angustifolium																			10z											
Grevillea arenaria		6hm			9n	9to								10p		10q			10z											
Grevillea asplenifolia		6hm														10q														
Grevillea baueri							9w												10z											
Grevillea buxifolia		6hm							10ag							10q														
Grevillea juniperina																		10x												
Grevillea laurifolia													10l										21c							

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Grevillea longifolia																				10q										
Grevillea mucronulata			6hm									10ag	10ar							10q					10z					
Grevillea obtusiflora																				10q										
Grevillea ramosissima															10dw					10q										
Grevillea triternata																									10z					
Hakea dactyloides		6hd						9to	9w			10ag	10ar				10mr				10r			10x	10z	15z	17a	17m	21c	
Hakea gibbosa																				10q										
Hakea microcarpa																														26t
Hakea salicifolia			6hm				9n													10q					10z					
Hakea sericea		6hd	6hm					9to	9w											10q					10z					
Hakea sp. *B* (Kowmung)																		10p		10q										
Hakea teretifolia									9w																					
Isopogon anemonifolius			6hm									10ag								10q					10z	15z			21c	
Isopogon anethifolius																													21c	
Lambertia formosa			6hm									10ag	10ar																	
Lomatia ilicifolia									9w																10z	15z				
Lomatia myricoides			6hm				9n	9to		9x						10l									10z	15z				
Lomatia silaifolia		6hd	6hm						9w			10ag	10ar					10p		10q	10r			10x	10z					
Persoonia chamaepeuce																				10q										
Persoonia lanceolata									9w				10ar												10z	15z				
Persoonia laurina			6hm			9i						10ag	10ar							10q	10r			10x	10z					
Persoonia levis		6hd	6hm			9i		9to	9w	9x		10ag	10ar	10bh	10dw		10mr	10p		10q	10r				10z			17m		
Persoonia linearis			6hm					9to																	10z					
Persoonia mollis								9to				10ag																		
Persoonia mollis subsp. *ledifolia*								9w																						
Persoonia mollis var. *caleyi*								9to																						
Persoonia myrtilloides																									10z					
Persoonia oxycoccoides		6hd																											21c	26b
Petrophile pedunculata									9w			10ag	10ar												10z					
Petrophile pulchella																					10r								21c	
Petrophile sessilis			6hm																		10r				10z					
Stenocarpus salignus			6hm										10ar																	
Telopea speciosissima		6hd	6hm										10ar							10q					10z					
Xylomelum pyriforme																									10z					
Ranunculaceae																														
Clematis aristata			6hm	6k			9n		9w		9y								10pw	10q					10z					

Clematis glycinoides		6hd	6hm			9n	9to							10p	10pw	10q			
Ranunculus inundatus								9w											
Ranunculus lappaceus				6k		9n	9to							10p					
Rhamnaceae																			
Alphitonia excelsa			6hm																
Cryptandra amara								9w											
Cryptandra buxifolia																10q			
Cryptandra ericoides																			
Pomaderris andromedifolia			6hm		9i		9to				10bh					10q	10z	17m	
Pomaderris aspera			6hm			9n								10p		10q			
Pomaderris discolor					9i											10q			
Pomaderris elliptica			6hm																
Pomaderris eriocephala																10q			
Pomaderris ferruginea																	10z		
Pomaderris intermedia		6hd			9i				9x		10ar			10p		10q	10z		
Pomaderris lanigera											10ar						10z		
Pomaderris ledifolia																	10z		
Pomaderris vellea														10p		10q			
Rosaceae																			
Acaena echinata	6g					9n			9x										
Acaena novae-zelandiae							9to	9w	9x						10pw				
Acaena ovina															10pw				
Rubus hillii			6hm		8d	9n			9x					10p					
Rubus parvifolius		6hd		6k					9x						10pw	10q			
Rubus rosifolius				6k	8d														
Rubiaceae																			
Asperula conferta		6hd										10dw				10q			
Asperula gunnii		6hd																	
Asperula scoparia						9n							10l		10pw				
Coprosma quadrifida				6k	8d	9n													
Galium binifolium			6hm			9n													
Galium gaudichaudii	6g					9n													
Galium liratum						9n													
Galium propinquum				6k															
Morinda jasminoides		6hd	6hm		8d	9n										10q			
Opercularia aspera		6hd	6hm						9x	9y									
Opercularia diphylla						9n								10p		10q			
Opercularia hispida		6hd												10p	10pw	10q			
Opercularia varia																10q			

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Pomax umbellata		6hd										10ag	10ar		10dw	10l		10p		10q	10r				10z					
Psychotria loniceroides			6hm																											
Rutaceae																														
Acronychia oblongifolia				6k																										
Asterolasia correifolia			6hm																											
Boronia anemonifolia																														
Boronia anethifolia																										15z				
Boronia floribunda																		10p												
Boronia ledifolia			6hm										10ar					10p		10q					10z					
Boronia pinnata																		10p												
Correa reflexa			6hm										10ar							10q										
Crowea exalata																														
Eriostemon australasius													10ar																	
Eriostemon myoporoides							9n											10p												
Meliocope micrococca			6hm		8d															10q										
Phebalium squameum							9n																							
Phebalium squamulosum subsp. *squamulosum*												10ag																		
Zieria arborescens			6hm				9n											10p												
Zieria cytisoides							9n											10p												
Zieria fraseri subsp. B			6hm																											
Zieria pilosa			6hm																											
Zieria smithii			6hm								9y																			
Santalaceae																														
Choretrum candollei							9n									10l									10z					
Choretrum pauciflorum							9n									10l									10z					
Exocarpos cupressiformis		6hd					9n	9to	9w		9y							10p	10pw	10q					10z					
Exocarpos strictus		6hd	6hm							9x		10ag								10q				10x	10z					
Leptomeria acida									9w									10p		10q	10r				10z					
Omphacomeria acerba								9to								10l		10p		10q	10r				10z					
Santalum obtusifolium																		10p		10q										
Sapindaceae																														
Alectryon subcinereus			6hm		8d																									
Dodonaea boroniifolia								9to												10q					10z					
Dodonaea multijuga															10dw					10q					10z					
Dodonaea pinnata																				10q										

Dodonaea triquetra			6hm									10ag							10pw	10q				10z	
Dodonaea viscosa		6hd	6hm			9n			9x	9y							10p			10q					
Guioa semiglauca		6hd	6hm		8d																				
Scrophulariaceae																									
Derwentia derwentiana						9n																			
Parahebe lithophila	6g																								
Veronica brownii						9n											10p								
Veronica calycina	6g		6hm			9n				9y							10p			10q					
Veronica notabilis				6k		9n									10l										
Veronica plebeia			6hm	6k				9w		9y			10dw						10pw	10q				10z	
Solanaceae																									
Duboisia myoporoides									9x																
Nicotiana suaveolens						9n																			
Solanum aviculare			6hm	6k	8d																				
Solanum cinereum		6hd	6hm										10dw							10q					
Solanum prinophyllum			6hm			9n			9x								10p								
Solanum pungetium		6hd	6hm	6k															10pw	10q					
Solanum stelligerum			6hm														10p								
Stackhousiaceae																									
Stackhousia viminea						9n	9to								10l		10p		10pw	10q					
Sterculiaceae																									
Brachychiton populneus		6hd	6hm		8d	9n							10dw				10p		10pw	10q					
Lasiopetalum ferrugineum			6hm			9n		9w				10ag									10r			10z	
Lasiopetalum macrophyllum			6hm																	10q					
Rulingia dasyphylla			6hm																						
Stylidiaceae																									
Stylidium graminifolium							9to	9w												10q	10r				
Stylidium laricifolium			6hm			9n						10ar								10q				10z	
Stylidium lineare								9w																	
Thymelaeaceae																									
Pimelea curviflora			6hm																						
Pimelea ligustrina subsp. *hypericina*				6k																					
Pimelea linifolia		6hd	6hm			9n						10ag	10ar							10q				10z	
Tremandraceae																									
Tetratheca thymifolia												10ag	10ar							10q	10r			10z	
Ulmaceae																									
Trema aspera			6hm																	10q					

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Urticaceae																														
Australina pusilla				6k																										
Dendrocnide excelsa			6hm		8d																									
Elatostema reticulatum					8d																									
Parietaria debilis							9n											10p												
Urtica incisa			6hm	6k	8d		9n	9to		9x									10pw	10q										
Verbenaceae																														
Clerodendrum tomentosum		6hd	6hm		8d		9n													10q										
Violaceae																														
Hybanthus monopetalus																				10q										
Hymenanthera dentata			6hm	6k	8d			9to																						
Viola betonicifolia						9i					9y		10ar			10l				10q		10s		10x						
Viola hederacea		6hd	6hm	6k			9n	9to		9x	9y							10p		10q										
Viola sieberiana																			10pw											
Viscaceae																														
Notothixos subaureus		6hd																												
Vitaceae																														
Cayratia clematidea		6hd	6hm		8d															10q										
Cissus antarctica			6hm		8d																									
Cissus hypoglauca		6hd	6hm		8d					9x										10q										
Winteraceae																														
Tasmannia insipida		6hd																												
MONOCOTYLEDONS																														
Alismataceae																														
Damasonium minus																									10z					
Anthericaceae																														
Arthropodium minus																				10q										
Laxmannia gracilis																				10q										
Thysanotus tuberosus																									10z					
Araceae																														
Gymnostachys anceps			6hm																											
Asphodelaceae																														
Bulbine bulbosa										9x																				
Colchicaceae																														
Schelhammera undulatum																									10z					
Wurmbea dioica								9to																						

Commelinaceae																		
Aneilema acuminatum	6hd	6hm	8d	9n														
Commelina cyanea	6hd	6hm	8d	9n			9x							10q				
Murdannia graminea		6hm																
Cyperaceae																		
Carex appressa							9x										21c	26b
Carex sp.		6hm												10q				
Caustis flexuosa				9n									10pw	10q				
Caustis recurvata					9to													
Cyathochaeta diandra										10ar								
Cyperus fulvus	6hd													10q				
Cyperus gracilis							9x					10p		10q				
Cyperus lucidus															10z			
Cyperus laevis							9x					10p		10q				
Cyperus sp. 1														10q				
Cyperus sp. 2	6hd																	
Cyperus sp. 3							9x											
Eleocharis sphacelata															10z			
Fimbristyis dichotoma												10p		10q				
Gahnia aspera						9w								10q				
Gahnia filifolia	6hd	6hm									10dw			10q				
Gahnia melanocarpa		6hm																
Gahnia microstachya														10q	10z			
Gahnia sieberiana	6hd	6hm		9n		9w								10q				
Gahnia subaequiglumis						9w												
Lepidosperma filiforme	6hd	6hm																
Lepidosperma gunnii									10ag							15z		
Lepidosperma laterale	6hd	6hm						9y			10dw	10p	10pw	10q	10z	15z	21c	
Lepidosperma limicola															10z			
Lepidosperma urophorum		6hm		9n			9x	9y				10p		10q	10z		21c	
Ptilothrix deusta																	21c	
Schoenus brevifolius								9y										
Schoenus ericetorum														10q				
Schoenus imberbis		6hm																
Schoenus melanostachys		6hm												10q	10z			
Haemodoraceae																		
Haemodorum planifolium															10z			
Hypoxidaceae																		
Hypoxis hygrometrica														10q	10z			

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Iridaceae																														
Libertia paniculata			6hm		8d		9n													10q										
Patersonia fragilis																				10q	10r								21c	26b
Patersonia glabrata			6hm						9w				10ar												10z	15z				
Patersonia longifolia													10ar		10dw					10q										
Patersonia sericea		6hd	6hm					9to												10q					10z					
Juncaceae																														
Juncus holoschoenus																				10q										
Juncus laeviusculus																														
subsp. *illawarrensis*																						10s								
Juncus subsecundus								9to																						
Juncus usitatus										9x								10p		10q										
Luzula flaccida																									10z					
Juncaginaceae																														
Triglochin procera																									10z					
Lomandraceae																														
Lomandra confertifolia		6hd	6hm						9w																10z					
Lomandra cylindrica												10ag													10z					
Lomandra filiformis																														
subsp. *coriacea*		6hd				9i			9w			10ag	10ar		10dw			10p	10pw	10q					10z					
Lomandra glauca								9to	9w		9y	10ag			10dw	10l		10p	10pw	10q	10r									
Lomandra gracilis		6hd	6hm									10ag						10p								15z				
Lomandra longifolia	6g	6hd	6hm	6k			9n	9to	9w	9x	9y			10bh		10l		10p	10pw	10q		10s		10x	10z		17a	17m		15z
Lomandra multiflora		6hd	6hm						9w						10dw	10l		10p	10pw	10q					10z		17a			
Lomandra obliqua		6hd	6hm																	10q	10r			10x	10z				21c	
Luzuriagaceae																														
Eustrephus latifolius		6hd	6hm	6k	8d		9n						10ar							10q										
Geitonoplesium cymosum		6hd	6hm	6k			9n				9y								10pw	10q										
Orchidaceae																														
Acianthus exsertus																		10p												
Acianthus fornicatus			6hm																	10q										
Bulbophyllum elisae							9n														10r									
Bulbophyllum exiguum			6hm							9x																				
Caladenia caerulea								9to	9w																					
Caladenia carnea								9to																						
Caladenia catenata																		10p		10q	10r									

Caleana major													10q						
Caleana minor													10q	10r				21c	
Calochilus campestris					9to								10q						
Chiloglotis reflexa sens. lat.				9n							10p		10q						
Chiloglottis pluricallata										10l				10s					
Chiloglottis sp.	6hd	6hm																	
Corybas aconitiflorus				9n							10p		10q						
Cryptostylis erecta		6hm											10q	10r				21c	
Cryptostylis leptochila										10l			10q						
Cryptostylis subulata											10p		10q	10r					
Cymbidium suave		6hm				10ar 10ag							10q						
Dendrobium aemulum		6hm																	
Dendrobium cucumerinum						9x													
Dendrobium linguiforme	6hd	6hm				9x													
Dendrobium speciosum	6hd	6hm		9n		10ar					10p		10q						
Dendrobium striolatum	6hd	6hm		9n							10p		10q			10z			
Dendrobium teretifolium				9n															
Dipodium punctatum						9x				10l			10q		10s				
Diuris maculata				9n	9to					10l	10p								
Eriochilus cucullatus																		21c	
Glossodia major					9to								10q						
Glossodia minor									10dw										
Liparis reflexa		6hm		9n		10ag										10z		21c	
Lyperanthus suaveolens										10l			10q						
Microtis unifolia																		21c	26b
Orthoceras strictum																		21c	
Plectorrhiza tridentata		6hm	8d	9n							10p								
Prasophyllum striatum														10r				21c	
Pterostylis coccina				9n					10dw		10p		10q						
Pterostylis longifolia				9n							10p		10q	10r					
Pterostylis nutans	6hd	6hm		9n							10p		10q					21c	
Pterostylis obtusa				9n							10p		10q					21c	
Pterostylis parviflora				9n							10p		10q					21c	
Sarcochilus falcatus		6hm	8d																
Sarcochilus hillii		6hm		9n							10p								
Thelymitra ixioides					9to	10ar				10l	10p		10q	10r	10s				
Phormiaceae																			
Dianella caerulea																			
var. *caerulea*	6hd	6hm				9w	9y	10ag			10p		10q	10r		10z			

Communities	6g	6hd	6hm	6k	8d	9i	9n	9to	9w	9x	9y	10ag	10ar	10bh	10dw	10l	10mr	10p	10pw	10q	10r	10s	10w	10x	10z	15z	17a	17m	21c	26b
Species																														
Dianella longifolia									9w																					
Dianella revoluta var. *revoluta*			6hm					9to	9w		9y			10bh						10q				10x	10z			17m		
Dianella tasmanica							9n						10ar												10z					
Stypandra glauca		6hd	6hm				9n	9to		9x	9y		✓					10p		10q	10r				10z					
Thelionema umbellatum																										15z				
Poaceae																														
Anisopogon avenaceus																									10z					
Aristida calycina																		10p												
Aristida ramosa									9w						10dw				10pw	10q					10z					
Aristida vagans									9w		9y				10dw			10p		10q				10x						
Aristida warburgii																			10pw	10q										
Bothriochloa macra																			10pw	10q										
Cenchrus caliculatus		6hd																	10pw											
Chionochloa pallida																				10q										
Chloris ventricosa															10dw				10pw	10q										
Cymbopogon refractus		6hd									9y							10p	10pw	10q										
Cynodon dactylon										9x																				
Danthonia caespitosa																														
Danthonia linkii								9to																		15z				
Danthonia longifolia																									10z					
Danthonia pilosa																			10pw											
Danthonia tenuior									9w																					
Deyeuxia sp.																														
Dichelachne micrantha											9y									10q										
Dichelachne rara																				10q										
Digitaria diffusa																				10q										
Digitaria parviflora			6hm																	10q										
Digitaria ramularis									9w																					
Echinopogon caespitosus							9n			9x	9y								10pw	10q										
Echinopogon ovatus		6hd	6hm											10bh	10dw			10p	10pw	10q								17m		
Entolasia marginata			6hm							9x	9y													10x						
Entolasia stricta		6hd	6hm						9w			10ag	10ar		10dw					10q				10x	10z				21c	
Entolasia whiteana																				10q										
Eragrostis benthamii									9w																					
Eragrostis brownii																				10q										
Eragrostis elongata																			10pw											

Eriochloa pseudoacrotricha																															21c
Imperata cylindrica var. *major*		6hd	6hm					9x								10p		10q													
Microlaena stipoides																															
var. *stipoides*				6k				9x								10p		10q		10w	10x	10z									
Oplismenus aemulus	6g	6hd	6hm		8d	9n		9x								10p	10pw	10q													
Oplismenus imbecillis		6hd	6hm		8d	9n		9x								10p															
Panicum effusum		6hd															10pw							15z							
Panicum simile							9w											10q													
Paspalidium criniforme																		10q													
Paspalum distichum								9x																							
Phragmites australis								9x																							
Poa labillardieri				6k										10l						10s	10w		10z								
Poa poiformis						9n										10p															
Poa sieberiana var. *sieberiana*			6hm			9n		9x								10p		10q		10s											
Poa sieberiana var. *cyanophylla*																10pw															
Sporobolus elongatus																	10pw														
Stipa mollis										10ar								10q													
Stipa pubescens																															
Stipa ramosissima			6hm			9n		9x								10p	10pw	10q													
Stipa rudis subsp. *nervosa*							9w																								
Stipa verticillata			6hm																												
Themeda australis		6hd	6hm	6k			9w		9y	10ar						10p	10pw	10q			10x	10z									
Restionaceae																															
Lepyrodia scariosa																						10z		17a							
Restio fimbriatus																				10s		10z									
Smilaceae																															
Ripogonum album			6hm																												
Smilax australis		6hd	6hm	6k					9y																						
Smilax glyciphylla		6hd	6hm							10ag	10ar							10q				10z									
Typhpaceae																															
Typha domingensis																						10z									
Typha orientalis								9x																							
Uvulariaceae																															
Schelhammera undulata																						10z									
Xanthorrhoeaceae																															
Xanthorrhoea arborea		6hd	6hm															10q													
Xanthorrhoea media										10ag	10ar																				
Xanthorrhoea minor																		10q													
Xanthorrhoea resinifera																		10q			10x	10z									