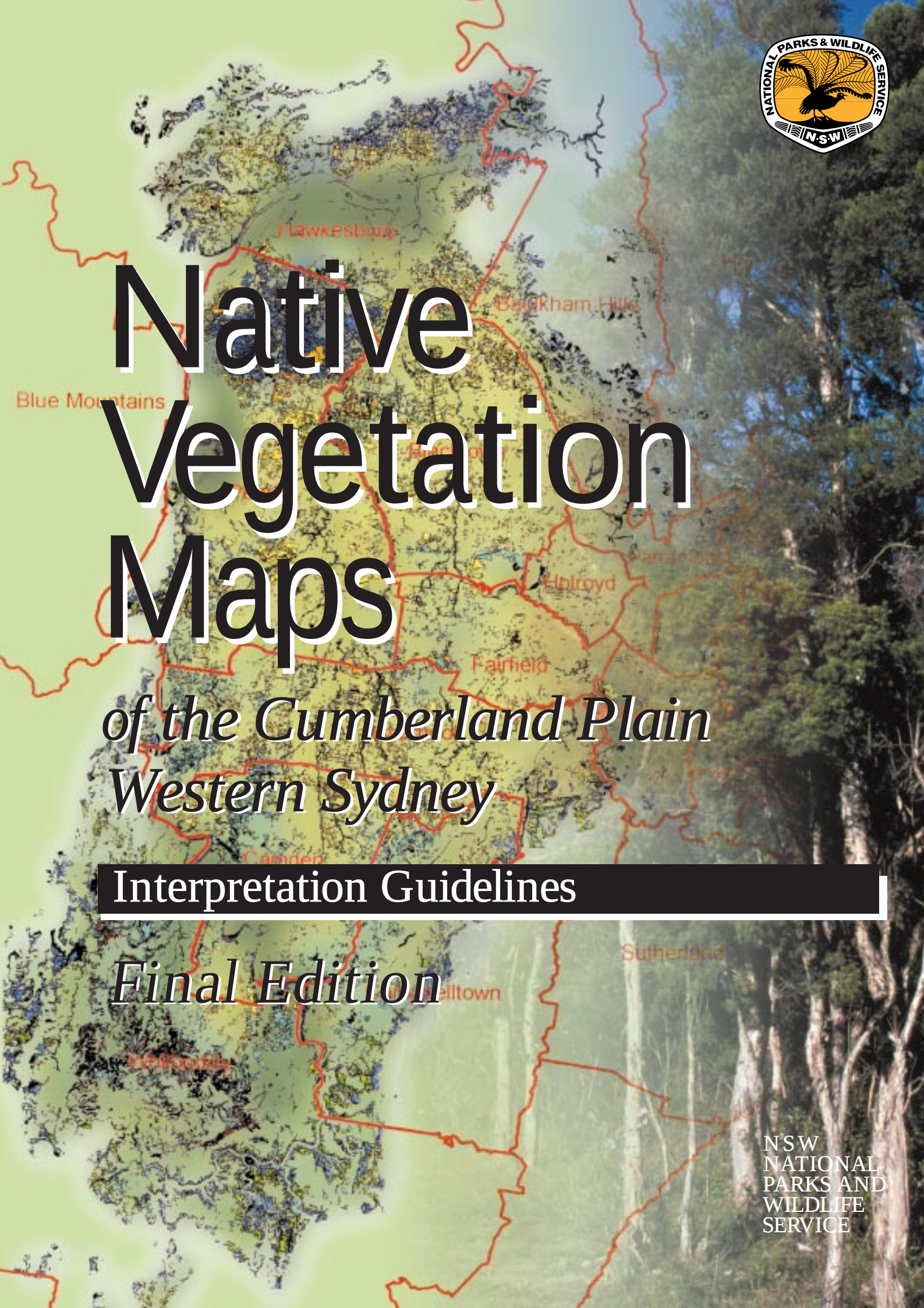

Native Vegetation Maps

of the Cumberland Plain Western Sydney

Interpretation Guidelines

Final Edition

NSW NATIONAL PARKS AND WILDLIFE SERVICE

Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney.

Final Edition

Threatened Species Unit
Conservation Programs and Planning Division
Central Directorate.

NSW National Parks and Wildlife Service.

October 2002

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Preface

Since the production of the interim Cumberland Plain vegetation maps and reports in January 2000, the NPWS has reviewed the mapping, received comments from users, conducted further API, surveyed an additional 200 sites, remodelled community distribution and final versions of the maps, data layers and Interpretation Guidelines are now available.

The new products differ from the previous version in a number of ways:

1. They are not available as hard copy printed maps. Instead PDF versions have been placed on the NPWS web site (npws.nsw.gov.au) for free downloading. These maps are also on a CD that is available for purchase by completing and forwarding an application form and data licensing agreement.
2. Additional API has increased the map coverage in the NW sector of the study area.
3. Improved modelling has resulted in areas of previously unidentified vegetation being added (eg in the Scheyville area).
4. The maps have included non-Cumberland Plain communities, where these exist within the study area, to assist users identifying all the vegetation present.
5. The display, on the maps, of vegetation of different condition has been altered to more accurately reflect the differences that the data is able to reliably detect.
6. The re-modelling of vegetation communities and additional API have resulted in changes to the statistics presented in this report, compared to equivalent statistics in the January 2000 edition.
7. These Interpretation Guidelines discuss the above changes, and include community descriptions and diagnostic species lists for the non-Cumberland Plain communities, again to assist users in identifying vegetation. These guidelines assist in the understanding of the maps by explaining different codes and categories that were used in the project. This is an essential document if the maps are to be understood completely.
8. The published CD contains the following information:
   - The vegetation maps
   - These Interpretation Guidelines for the vegetation maps
   - Vegetation data layers in several different Geographic Information System (GIS) formats. These enable users to create their own maps of specific areas and also allow statistical analysis of the data. The data layers are now being used widely by Councils and businesses to aid decision making.
   - A map showing the conservation significance of remnants.
   - A rule set describing how the conservation significance was derived
   - Conservation significance data layers
   - Endangered ecological community profiles.

The NPWS wishes these maps to be widely distributed and they may be printed by anyone who wishes, either partially or in their entirety. They may not, however, be on sold. The purchase of the CD involves signing a data licensing agreement for the data layers that also prevents them being on sold.

Foreword

The Western Sydney Native Vegetation Mapping Project commenced in November 1998 to provide an up-to-date data layer of the distribution and relative condition of all remnant native vegetation in Western Sydney. Particular attention was given to those communities listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act), as Endangered Ecological Communities (and communities that may be listed) as described by the NSW Scientific Committee.

This report has been prepared to guide the use of the map series and the data layers for use on various Geographic Information Systems (GIS).

The information in this report, the data layers and the maps will assist land managers and decision makers in their assessment of the significance of development proposals and their ongoing management of vegetation remnants. This is achieved by presenting information in a regional context for native vegetation across the whole of the Cumberland Plain.

The maps and information derived from the data layers will be incorporated into the recovery plan for these communities and will be used to assist decision-making with regards to their conservation and recovery.

The NPWS acknowledges the significant financial support provided by Landcom and the Urban Development Institute of Australia to the project.

BRIAN GILLIGAN
DIRECTOR-GENERAL

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1 Introduction

Since European settlement of the fertile land of the Cumberland Plain, the native vegetation has been extensively cleared, initially for agriculture and more recently for residential, commercial and industrial land uses. The native vegetation has been cleared to such an extent that very little of the pre-European distribution remains and many of the plant communities remaining are now considered under threat of extinction. In 1996 the *Threatened Species Conservation Act 1995* (TSC Act) was introduced to address the decline of species, populations and communities across the State. Cumberland Plain Woodland was the first endangered ecological community to be listed by the Scientific Committee in June 1997. Since 1997, the Scientific Committee has listed over 50 communities as endangered across NSW including those listed in Table 1 which occur on the Cumberland Plain.

Table 1: Endangered Ecological Communities of the Cumberland Plain. (As of 1 September 2002)

Community Name	**Gazettal Date**
Agnes Banks Woodland	3 November 2000
Blue Gum High Forest	5 September 1997
Castlereagh Swamp Woodland	24 December 1999
Cooks River/Castlereagh Ironbark Forest	10 May 2001
Cumberland Plain Woodland	13 June 1997
Elderslie Banksia Scrub Forest	9 October 1998
Moist Shale Woodland	19 April 2002
Shale Gravel Transition Forest	19 April 2002
Shale/Sandstone Transition Forest	11 September 1998
Sydney Coastal River Flat Forest	12 February 1999
Sydney Turpentine Ironbark Forest	16 October 1998
Western Sydney Dry Rainforest	24 March 2000

Since the listing of these communities, particularly Cumberland Plain Woodland, the National Parks and Wildlife Service (NPWS) has received numerous requests for more detailed information on the distribution, condition and significance of these endangered ecological communities. In responding to these requests it has become evident that there are limitations and gaps in the current information available.

Broad scale mapping of native vegetation across the Cumberland Plain has been undertaken by the Royal Botanical Gardens, Sydney (RBG), and is published in *Taken for Granted – The Bushland of Sydney and its suburbs* (Benson & Howell, 1990) and subsequent 1:100 000 vegetation mapsheets for the Penrith (Benson, 1992), Sydney (Benson & Howell, 1994) and St Albans (Ryan, Fisher & Schaeper, 1996) mapsheets. The southern portion of the Cumberland Plain is covered by the Wollongong vegetation mapsheet, which has not been published to date.

However, there are some inherent problems in the application of this mapping to determinations made by the Scientific Committee, the development assessment process and the recovery planning responsibilities of the NPWS. The mapping is limited by:

- the extent to which patterns in vegetation cover have changed since the late 1970s (when the aerial photography was taken for much of this work);
- the size of the remnants mapped, ie. only 5 ha or greater;
- the community descriptions were not based on repeatable systematic analysis of floristic and structural data; and
- in some instances the communities defined by the Scientific Committee were not described in published material.

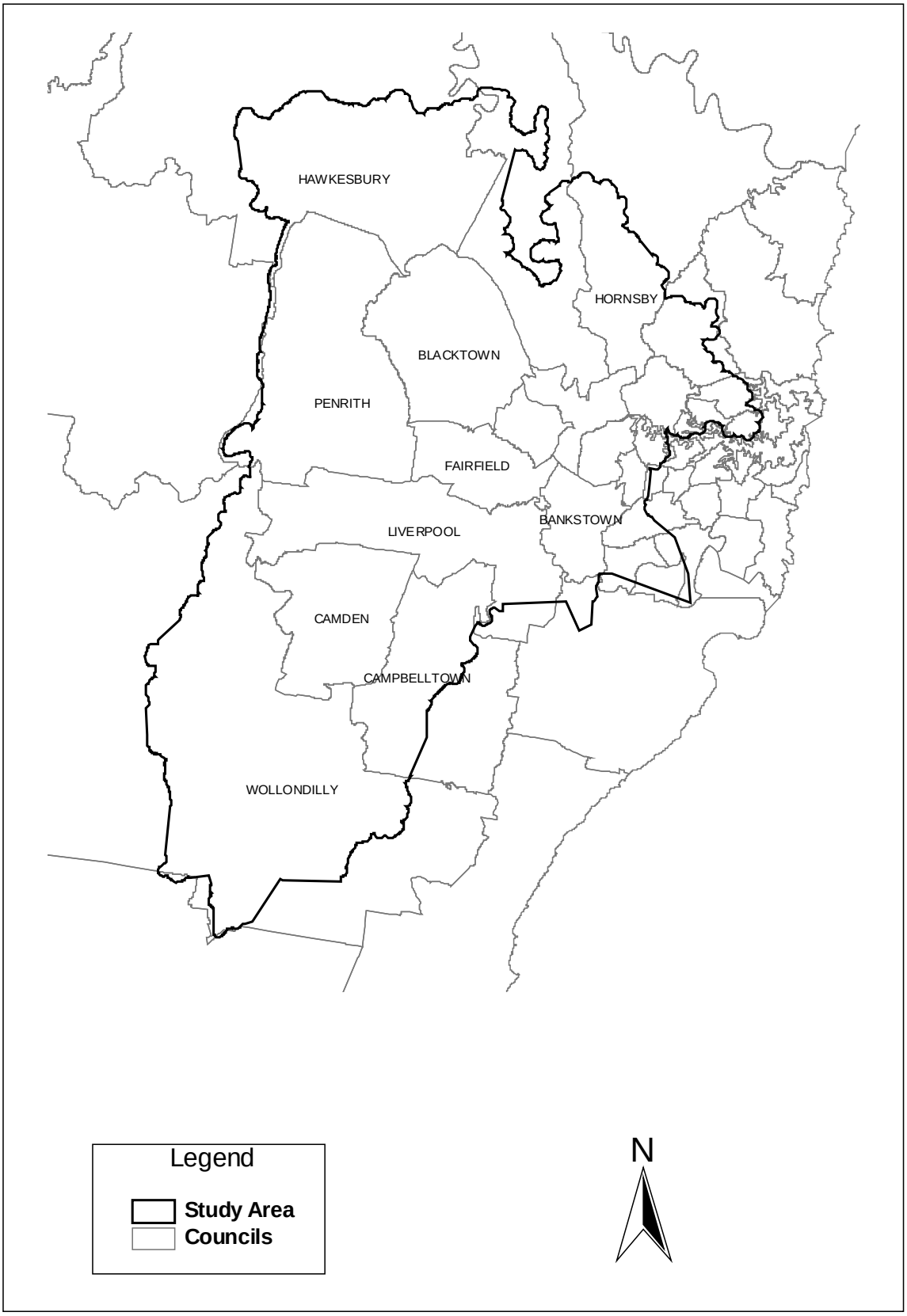
This project sought to address these limitations by completing fine scale (1:16000) aerial photographic interpretation (API) assessment using recent photographs and implementing a systematic survey strategy which built on previous research. Such an approach has afforded a foundation to future data collection and analysis which may help resolve ongoing issues relating to the classification and description of communities on the Cumberland Plain.

2 Project Aims

The aims of the Western Sydney mapping project were to:

- Map all remnant vegetation greater than 0.5 ha in size, within the Cumberland Plain and sections of the Hornsby Plateau where Blue Gum High Forest and Sydney Turpentine Ironbark Forest are found (study area) using repeatable, scientifically robust methods. Figure 1 illustrates the location of the study area.
- Provide large scale (1:25 000) published maps of all vegetation mapped by the project;
- Provide greater certainty and rigour to the environmental impact assessment process through consistent, region wide mapping; and
- Provide sufficient information to guide the identification of core and complimentary conservation areas.

Figure 1: Study Area



3 Mapping Process

Mapping consisted of two main data gathering phases. The first was the identification and mapping of vegetation remnants using aerial photograph interpretation (API). The second was the collection of site data. Field site data is then analysed to describe the floristic composition of the vegetation communities. The vegetation communities are then mapped by drawing on relationships between field site data describing each community, soil, climatic and landform patterns. In this way patterns in the distribution of vegetation communities prior to clearing can be estimated.

A brief summary is provided on the API, floristic surveys and vegetation modelling components of the mapping project. For additional information please refer to the following reports:

- "*Cumberland Plain Woodland Recovery Plan - Air Photo Interpretation and Data Capture*" (Ian Roberts, Earth Resource Analysis P/L, 1999); and
- "*The Native Vegetation of the Cumberland Plain, Western Sydney – Technical Report*" (NSW National Parks and Wildlife Service, 2000a).

3.1 Aerial Photograph Interpretation

The interpretation of aerial photographs was used to delineate the current extent and condition of remnant vegetation within the study area. This was done by identifying all intact remnants greater than 0.5 ha in size from 1:16 000 scale stereo aerial photographs (taken in Nov 97 – March 98). Each remnant was viewed through a stereoscope to delineate patterns in canopy cover, canopy species, understorey species and disturbance. Patterns were checked from over 4000 sample points. The API data was digitised to create a database layer of vegetation extent and condition.

3.2 Floristic surveys

Systematic quadrat surveys were conducted at over 600 sites of representative remnant vegetation across the study area between October 1998 and June 1999, and in 2000-01 (which included ground truthing surveys). Survey sites were chosen where vegetation was intact across variations of three environmental characteristics (substrate, temperature and rainfall). In each quadrat all flowering plants and their cover/abundance were recorded. For each strata or vegetation layer (tree, small tree, shrub and forb) the height range and projected foliage cover were estimated. In addition, information on other environmental characteristics was collected including: location, elevation, soils, slope, aspect (direction of slope), and disturbance (eg. erosion, weed invasion, logging, fire).

3.3 Vegetation classification and modelling

Field site data was analysed through a software package (PATN) to groups of sites of similar species composition and abundance. These were used to define the vegetation communities. These communities where then modelled across the study area using the program ALBERO (which utilises the relationships between field site data and environmental variables such as eg. rainfall, geology, slope, aspect). The modelled vegetation communities and the remnants identified in the API were then overlaid to create a final vegetation classification layer. Table 2 lists the 18 communities which were identified and described for the Cumberland Plain and their relevant classification under the TSC Act and previous studies.

A description of each community is provided in Appendix 1. These community descriptions also provide a list of characteristic and diagnostic species. The list of diagnostic species for each community can be used to assist in differentiating communities in the field. Species are classified into one of four categories which characterise the frequency with which they are recorded in a given community relative to other communities. Positive diagnostic species are more likely to be recorded in the target community than in other communities, although they may not always be present in high abundance. In particular, where the transition from one community to another is gradual the abundance of diagnostic species may decline steadily across the transition. See Appendix 8 for more information on this issue.

The current mapping is the most up-to-date mapping for vegetation communities across the Cumberland Plain. With this information and a predicted distribution of the vegetation communities across the Cumberland Plain prior to European Settlement (ie. pre 1750) it is possible to update statistics on the proportion of each community remaining. These statistics are summarised in Table 3 and broken down for each local government area across the study area (Appendix 2). Please note that these statistics may differ from what has been previously cited by the Scientific Committee in their determinations which were based on the data and mapping available at the time (ie. Benson 1992; Benson & Howell 1990, 1994). This is partly due to the limiting factors noted in Section 1, in addition to the differences in the defined study areas. The NPWS study area extended previous boundaries along the Hawkesbury-Nepean River to the north-west and south, covering all vegetation on Shale derived soils.

Table 2: The relationship between the mapped ecological communities and communities described in previous studies, or listed on Schedule 1 of the NSW *Threatened Species Conservation Act 1995* (As of 1 September 2002).

Community ID	Native Vegetation of the Cumberland Plain, Western Sydney (2002)	NSW Threatened Species Act	The Natural Vegetation of the Penrith and Sydney 1:100000 Map Sheets; Benson (1992, 1994)	Urban Bushland Biodiversity Survey, NPWS (1997)
1	Shale/Sandstone Transition Forest (Low Sandstone Influence)	Shale/Sandstone Transition Forest	-	Western Shale/Sandstone Transition Forest
2	Shale/Sandstone Transition Forest (High Sandstone Influence)	Shale/Sandstone Transition Forest	-	Western Shale/Sandstone Transition Forest
3	Cooks River/ Castlereagh Ironbark Forest	Cooks River/ Castlereagh Ironbark Forest	Shale/Gravel Transition Forest (9d) Castlereagh Ironbark Forest (9e)	Eastern Shale/Sandstone Transition Forest Castlereagh Ironbark Forest
4	Castlereagh Swamp Woodland	Castlereagh Swamp Woodland	Swamp Woodland (14c)	Castlereagh Swamp Woodland
11	Alluvial Woodland	Sydney Coastal River Flat Forest	River Flat Forest (9f)	River-flat Forest (Cumberland Plain creek systems)
12	Riparian Forest	Sydney Coastal River Flat Forest	River Flat Forest (9f), Camden White Gum Forest (6d)	River-flat Forest (Hawkesbury-Nepean River and major tributaries)
6	Castlereagh Scribbly Gum Woodland	Not listed	Castlereagh Scribbly Gum Woodland (14a)	Castlereagh Scribbly Gum Woodland
8	Agnes Banks Woodland	Agnes Banks Woodland	Agnes Banks Woodland (14b)	Agnes Banks Woodland
37	Elderslie Banksia Scrub Forest	Elderslie *Banksia* Scrub Forest	-	Elderslie *Banksia* Scrub/Forest

Table 2 (Con't):

Community ID	Native Vegetation of the Cumberland Plain, Western Sydney (2002)	NSW Threatened Species Act	The Natural Vegetation of the Penrith and Sydney 1:100000 Map Sheets; Benson (1992, 1994)	Urban Bushland Biodiversity Survey, NPWS (1997)
9	Shale Hills Woodland	Cumberland Plain Woodland	Spotted Gum Forest (9b), Grey Box Woodland (10c), Grey Box – Ironbark Woodland (10d)	Spotted Gum Forest, Grey Box Woodland, Grey Box – Ironbark Woodland
10	Shale Plains Woodland	Cumberland Plain Woodland	Spotted Gum Forest (9b), Grey Box Woodland (10c), Grey Box – Ironbark Woodland (10d)	Spotted Gum Forest, Grey Box Woodland, Grey Box – Ironbark Woodland
13	Western Sydney Dry Rainforest	Western Sydney Dry Rainforest	-	Dry Rainforest
14	Moist Shale Woodland	Moist Shale Woodland	-	-
15	Turpentine-Ironbark Forest	Sydney Turpentine Ironbark Forest	Turpentine-Ironbark Forest (9o)	Turpentine-Ironbark Forest
43	Turpentine-Ironbark Margin Forest	Sydney Turpentine Ironbark Forest	Ironbark Forest (9c)	Western Shale/Sandstone Transition Forest
152	Blue Gum High Forest	Blue Gum High Forest	Blue Gum High Forest (6b)	Blue Gum High Forest
103	Shale Gravel Transition Forest	Shale Gravel transition Forest	Shale/Gravel Transition Forest (9d)	Shale/Gravel Transition Forest
36	Freshwater Wetlands	Not listed	Freshwater Wetlands (28a)	River-flat Forest (Wetlands)

Table 3: Extent of the vegetation communities pre 1750 and at present.

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C +SA
	A* (ha)	B* (ha)	C* (ha)	SA* (ha)	Total A+B+C+SA (ha)	Cmi* (ha)	TX* (ha)	TXR* (ha)	Total Cmi+TX+TXR (ha)	Total TXU* (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	1,010.8	231.1	1.1		1,243.0	137.7	1,309.3	177.9	1,624.9	456.8	3,324.7	12,827.9	25.9%	9.7%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	8,007.9	672.1	0.3	26.6	8,706.9	219.9	4,742.4	1,355.7	6,318.0	1,003.1	16,028.0	31,162.3	51.4%	27.9%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*9,018.7*	*903.2*	*1.4*	*26.6*	*9,949.8*	*357.5*	*6,051.8*	*1,533.6*	*7,942.9*	*1,460.0*	*19,352.7*	*43,990.1*	*44.0%*	*22.6%*
3 - Cooks River Castlereagh Ironbark Forest	898.2	64.5	48.9		1,011.6	0.9	201.5	204.7	407.1	342.8	1,761.4	12,185.4	14.5%	8.3%
4 - Castlereagh Swamp Woodland	574.8	4.9	36.3		616.0	0.3	31.3	9.9	41.5	13.9	671.3	1,006.0	66.7%	61.2%
6 - Castlereagh Scribbly Gum Woodland**	2,916.2	115.2	51.9		3,083.3	0.9	278.7	765.4	1,045.0	53.9	4,182.2	5,852.4	71.5%	52.7%
8 - Agnes Banks Woodland	89.8			8.0	97.8		79.1	6.7	85.8		183.6	615.2	29.8%	15.9%
9 - Shale Hills Woodland	3,324.2	924.5	60.5		4,309.2	1,154.3	3,966.1	529.1	5,649.5	377.1	10,335.8	38,273.9	27.0%	11.3%
10 - Shale Plains Woodland	5,250.7	1,490.0	4.5		6,745.3	106.9	5,622.0	2,539.0	8,267.9	2,826.0	17,839.2	87,172.4	20.5%	7.7%
Sub-total - 9 & 10 Cumberland Plain Woodland	*8,575.0*	*2,414.5*	*65.0*	*0.0*	*11,054.5*	*1,261.3*	*9,588.0*	*3,068.1*	*13,917.4*	*3,203.1*	*28,175.0*	*125,446.3*	*22.5%*	*8.8%*
11 - Alluvial Woodland	3,269.1	488.3	971.7		4,729.1	404.4	2,820.5	244.6	3,469.5	267.2	8,465.7	36,172.8	23.4%	13.1%
12 - Riparian Forest	571.5	9.1	136.4		717.0	176.6	235.8	3.3	415.8	16.3	1,149.1	2,989.0	38.4%	24.0%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*3,840.6*	*497.4*	*1,108.1*	*0.0*	*5,446.1*	*581.0*	*3,056.3*	*247.9*	*3,885.2*	*283.5*	*9,614.8*	*39,161.8*	*24.6%*	*13.9%*
13 - Western Sydney Dry Rainforest	229.7	34.1	74.4		338.2	106.9	122.0	3.2	232.1	10.3	580.6	1,281.8	45.3%	26.4%
14 - Moist Shale Woodland	526.3	41.2	36.6		604.1	305.2	234.2	3.9	543.3	1.4	1,148.9	2,033.6	56.5%	29.7%
15 - Turpentine-Ironbark Forest	221.0	14.3	0.3		235.7	108.5	222.1	154.9	485.5	552.6	1,273.7	14,574.0	8.7%	1.6%
43 - Turpentine-Ironbark Margin Forest	800.5	93.4		52.1	946.0	62.3	314.4	739.8	1,116.4	2,046.8	4,109.3	11,942.4	34.4%	7.9%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*1,021.5*	*107.8*	*0.3*	*52.1*	*1,181.7*	*170.8*	*536.5*	*894.7*	*1,601.9*	*2,599.4*	*5,383.0*	*26,516.4*	20.3%	4.5%
36 - Freshwater Wetlands*	5.9	658.3			664.2		2.1		2.1		666.3	1,552.4	42.9%	42.8%
37 - Elderslie Banksia Scrub Forest	12.4	0.5	0.5		13.4		1.7		1.7		15.1	Not modelled	n/a	n/a
103 - Shale/Gravel Transition Forest	1,507.3	165.3		48.6	1,721.2	14.5	587.6	639.3	1,241.3	335.4	3,298.0	5,427.4	60.8%	31.7%
152 - Blue Gum High Forest	149.6	16.7		1.5	167.8	4.9	13.2	5.1	23.3	1,184.3	1,375.4	3,720.1	37.0%	4.5%
TOTAL	**29,365.9**	**5,023.7**	**1,423.3**	**136.7**	**35,949.7**	**2,804.3**	**20,784.0**	**7,382.4**	**30,970.7**	**9,487.9**	**76,408.2**	**268,789.0**	**28.4%**	**13.4%**

*See Table 4 for explanation of these terms

**Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

4 Interpreting the maps and data

This section provides guidance for those who are interpreting the maps and the data layer provided on CD and then using this information to assist in environmental assessment and subsequent decision making. In using the data layer a basic understanding of the use and manipulation of Geographic Information Systems (GIS) is required.

4.1 Interpreting the maps

The series of 16 maps of the Native Vegetation of the Cumberland Plain, Western Sydney, includes a set of 15 maps (1-15) produced at 1:25 000 scale across the study area, and a map at 1:100 000. The 1:25 000 series displays the vegetation communities on a Local Government Area (LGA) basis. The orientation of each of these maps is shown in Appendix 3. Some of the maps overlap, some maps include multiple LGAs and some LGAs are not wholly on one mapsheet or may occur on multiple mapsheets. Map 16 is the 1:100 000 map of the native vegetation of the whole of the Cumberland Plain, Western Sydney.

The maps display the vegetation communities in three subsets (see also Table 4):

- "Canopy Cover >10% (Unless Remnant >5ha, where Canopy Cover >5%)". This set consists of those remnants which were given and overstorey class of 'A' or 'B' by the API, a portion of those given a class of 'C', and those outside the API area and which were identified as vegetation by satellite imagery (class 'SA' in data layers)'
- "Canopy Cover < 10%". This set consists of those remnants given an overstorey class of 'Tx' or 'Txr' by the API and the remainder of the 'C' class.
- "Canopy Cover <10% (Urban Areas). Given an overstorey class of 'Txu', these are those areas of scattered trees where the API determined they were in an urban landscape (buildings and roads present), which may preclude the presence of native understorey (NB. ground truthing required to check this).

The 'C' class remnants were separated through analysis of API data and comparison to ground truthing data (field surveys, incidental observations, expert and local knowledge).

Some maps include unclassified remnants (shown in grey – community class 9999) which are remnants for which the level of confidence of the community classification using the vegetation modelling is unacceptable to display. The level of confidence is related to the adequacy of the sampling which decreased towards the margins of the study area and within naturally rare communities. Also shown in grey is vegetation within and outside the study area, generally on sandstone, that was not subject to modelling.

Table 4: Polygon classification codes.

Code	Description		
	Area (ha)	**CCPD (%)**	**Other descriptions of indigenous species**
A Full Code	> 0.5	> 10	Dominant canopy species, understorey characteristics, disturbance and reliability all coded.
B Partial Code	> 5	< 10	Tree cover species only with some overstorey and/or understorey integrity. Dominant canopy species and reliability coded. May have understorey code.
C Either Full or Partial Code			As for "A" or "B" except the dominant canopy species are non-eucalypts species.
SA			No API data. Remnant mapped using satellite imagery (usually Sandstone areas).
Cmi Either Full or Partial Code			Subdivided from original "C" class (NSW NPWS 2000b) following further data evaluation and ground truthing (see page 9). Means 'C minus'.
Tx	> 0.5	< 10	Tree cover only with agriculture but no major urban or suburban development. Most have dominant canopy species coded.
Txr	> 0.5	< 10	Tree cover only with rural residential development. Most have dominant canopy species coded.
Txu	> 0.5	< 10	Tree cover only with urban development. Most have dominant canopy species coded.
X	-	-	No tree cover

Main Source: Roberts 1999.
CCPD = the Crown Cover Projection Density

4.2 Interpreting the data on the CD

The digital vegetation layer can be used in various GIS software packages and can be manipulated within the layer or with other layers. The vegetation layer itself has various attributes tagged to each polygon, therefore it is possible to display subsets of the vegetation layer by selecting individual or groups of attributes. Appendix 4 explains and provides examples of these codes from Roberts (1999)

Table 5 indicates the various attributes that may have been tagged to each polygon as assigned during the API and vegetation modelling. These attributes are available on the data layers. Please note that only Full Code ("A" or "C") polygon coded remnants will have all these attributes.

Table 5: Attributes and field descriptions for mapped polygons

Attribute	Field description
Polygon_id	Unique number for each polygon
Community _id	A number representing vegetation communities as modelled across the Cumberland Plain as per Table 2.
Polygon_code	Condition of remnant as per Table 4 (A, B, C, SA, TX, TXr, Txu, X).
Species_code	A number assigned to the dominant canopy species (see Appendix 5 extract from Roberts (1999) pp 12-13).
Us1	Letters assigned to the dominant understorey composition. (See Appendix 6 extract from Roberts (1999) pp 18-19).
Us2	Letters assigned to the secondary understorey composition. (See Appendix 6 extract from Roberts (1999) pp 18-19)
Disturbance	A letter assigned to the ecological condition assigned to visited polygons with visible human disturbance, (eg. A – Canopy, F – grazing/mowing, see Appendix 7 extract from Roberts (1999) pg 24)
Reliability code	A four scale code, where 1 = VERY HIGH and 4 = LOW reliability. (See Roberts (1999) pg 22)
Area	Polygon area (m^2)
Perimeter	Polygon perimeter (m)
Hectares	Polygon area (ha)

It is possible to display a subset of a certain community type, for example Cumberland Plain Woodland (Class = 9 and 10), of high quality (polygon code = A, B or C) and greater than 10 ha (area >= 10ha). Similar manipulations can be completed for other attributes and other communities.

As part of the mapping project other data layers have been collected to assist in the recovery planning process. The three key layers are: cadastral/property boundaries; land use zoning; and tenure/ownership classifications. Tables 6a and 6b show the proportion of each community by zoning across the study area.

4.3 Using maps to assess impacts of proposals

As predictively modelled distribution of ecological communities can never be 100% accurate (and no map can unless every bushland remnant in the study area is visited), there are some limitations to the uses of the maps. These are explained more fully in Section 5 (and briefly in the disclaimer displayed on each map). It is essential that as part of the impact assessment process, each site is surveyed to verify the mapped information. In doing this the community classification, boundary and condition can be verified. As noted in Section 3, the community descriptions can be used by Council, developers, and their consultants to apply consistent, scientific criteria to identify or verify communities that may be impacted upon. Once the native vegetation has been verified its relative importance (or significance) can be assessed using the contextual information available in this report and in the data layers.

Table 6a: Extent of each vegetation community by zoning* across the study area (Overstorey codes A, B, C & SA only)

Vegetation Communities	Zoning Class										
	Rural (ha)	Residential (ha)	Commercial (ha)	Industrial (ha)	National Parks (ha)	Special Uses (ha)	Environment Protection (ha)	Open Space (ha)	Transport (ha)	Deferred** (ha)	TOTAL (ha)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	952.0	24.5	0.7	3.1	6.6	76.0	90.1	42.1	13.6	34.3	1,243.0
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	5,287.2	119.3	0.3	64.4	220.6	1,227.5	1,159.6	335.3	68.3	224.4	8,706.9
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*6,239.2*	*143.7*	*0.9*	*67.5*	*227.2*	*1,303.5*	*1,249.7*	*377.4*	*82.0*	*258.7*	*9,949.8*
3 - Cooks River Castlereagh Ironbark Forest	318.5	1.5	0.6	18.3	288.0	242.9	58.2	55.1		28.4	1,011.6
4 - Castlereagh Swamp Woodland	240.9	0.5		0.0	110.7	67.6	27.5	156.3		12.5	616.0
6 - Castlereagh Scribbly Gum Woodland***	2,004.3	6.2			385.7	123.5	202.8	274.6		86.3	3,083.3
8 - Agnes Banks Woodland	62.8	0.4			25.5		2.9	2.8		3.3	97.8
9 - Shale Hills Woodland	2,841.4	46.2	21.4	28.3	185.6	294.3	409.8	424.7	2.2	55.2	4,309.2
10 - Shale Plains Woodland	3,192.7	186.3	14.7	148.0	566.4	1,417.5	282.8	697.5	4.5	234.9	6,745.3
Sub-total - 9 & 10 Cumberland Plain Woodland	*6,034.1*	*232.5*	*36.2*	*176.3*	*752.0*	*1,711.8*	*692.6*	*1,122.2*	*6.7*	*290.0*	*11,054.5*
11 - Alluvial Woodland	2,525.4	68.9	13.4	52.9	65.7	1,067.7	252.0	543.7	0.9	138.4	4,729.1
12 - Riparian Forest	406.1	2.1		2.9	4.3	56.0	67.2	147.4		31.0	717.0
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*2,931.5*	*71.0*	*13.4*	*55.8*	*70.0*	*1,123.7*	*319.2*	*691.2*	*0.9*	*169.4*	*5,446.1*
13 - Western Sydney Dry Rainforest	242.3	7.7			2.4	1.7	73.7	6.4	0.9	3.2	338.2
14 - Moist Shale Woodland	387.0	1.0			6.8	0.8	185.0	13.9		9.7	604.1
15 - Turpentine-Ironbark Forest	70.5	41.2	1.6	0.3	1.6	31.3	19.2	58.6	0.8	10.7	235.7
43 - Turpentine-Ironbark Margin Forest	501.3	107.9	2.5	1.2	24.0	79.9	87.0	110.1	0.6	31.6	946.0
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	571.8	149.0	4.1	1.5	25.6	111.2	106.2	168.6	1.3	42.3	1,181.7
36 - Freshwater Wetlands*	136.3			0.2	71.1	75.4	316.4	63.0	0.1	1.7	664.2
37 - Elderslie Banksia Scrub Forest	13.2									0.2	13.4
103 - Shale/Gravel Transition Forest	551.6	16.4	2.5	9.0	145.8	439.1	260.4	236.7		59.8	1,721.2
152 - Blue Gum High Forest	3.2	36.3	11.1		17.7	37.2		47.7	5.2	9.4	167.8
TOTAL	**19,736.7**	**666.2**	**68.8**	**328.6**	**2,128.8**	**5,238.2**	**3,494.4**	**3,215.7**	**97.2**	**975.0**	**35,949.7**

* Based on zoning information provided by Councils in 1999, in a variety of formats, subject to error in transferring to NPWS systems and changes since data of data capture. Should be considered indicative only.
** Indicates not zoned.
***Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Table 6b: Proportion of each vegetation community by zoning* across the study area (percentage - overstorey codes A, B, C & SA only)

Vegetation Communities	Zoning Class										
	Rural (ha)	Residential (ha)	Commercial (ha)	Industrial (ha)	National Parks (ha)	Special Uses (ha)	Environment Protection (ha)	Open Space (ha)	Transport (ha)	Deferred** (ha)	TOTAL (ha)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	76.6%	2.0%	0.1%	0.2%	0.5%	6.1%	7.3%	3.4%	1.1%	2.8%	100.0%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	60.7%	1.4%	0.0%	0.7%	2.5%	14.1%	13.3%	3.9%	0.8%	2.6%	100.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*62.7%*	*1.4%*	*0.0%*	*0.7%*	*2.3%*	*13.1%*	*12.6%*	*3.8%*	*0.8%*	*2.6%*	*100.0%*
3 - Cooks River Castlereagh Ironbark Forest	31.5%	0.1%	0.1%	1.8%	28.5%	24.0%	5.8%	5.4%	0.0%	2.8%	100.0%
4 - Castlereagh Swamp Woodland	39.1%	0.1%	0.0%	0.0%	18.0%	11.0%	4.5%	25.4%	0.0%	2.0%	100.0%
6 - Castlereagh Scribbly Gum Woodland***	65.0%	0.2%	0.0%	0.0%	12.5%	4.0%	6.6%	8.9%	0.0%	2.8%	100.0%
8 - Agnes Banks Woodland	64.3%	0.4%	0.0%	0.0%	26.1%	0.0%	3.0%	2.9%	0.0%	3.4%	100.0%
9 - Shale Hills Woodland	65.9%	1.1%	0.5%	0.7%	4.3%	6.8%	9.5%	9.9%	0.1%	1.3%	100.0%
10 - Shale Plains Woodland	47.3%	2.8%	0.2%	2.2%	8.4%	21.0%	4.2%	10.3%	0.1%	3.5%	100.0%
Sub-total - 9 & 10 Cumberland Plain Woodland	*54.6%*	*2.1%*	*0.3%*	*1.6%*	*6.8%*	*15.5%*	*6.3%*	*10.2%*	*0.1%*	*2.6%*	*100.0%*
11 - Alluvial Woodland	53.4%	1.5%	0.3%	1.1%	1.4%	22.6%	5.3%	11.5%	0.0%	2.9%	100.0%
12 - Riparian Forest	56.6%	0.3%	0.0%	0.4%	0.6%	7.8%	9.4%	20.6%	0.0%	4.3%	100.0%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*53.8%*	*1.3%*	*0.2%*	*1.0%*	*1.3%*	*20.6%*	*5.9%*	*12.7%*	*0.0%*	*3.1%*	*100.0%*
13 - Western Sydney Dry Rainforest	71.6%	2.3%	0.0%	0.0%	0.7%	0.5%	21.8%	1.9%	0.3%	1.0%	100.0%
14 - Moist Shale Woodland	64.1%	0.2%	0.0%	0.0%	1.1%	0.1%	30.6%	2.3%	0.0%	1.6%	100.0%
15 - Turpentine-Ironbark Forest	29.9%	17.5%	0.7%	0.1%	0.7%	13.3%	8.1%	24.9%	0.3%	4.5%	100.0%
43 - Turpentine-Ironbark Margin Forest	53.0%	11.4%	0.3%	0.1%	2.5%	8.4%	9.2%	11.6%	0.1%	3.3%	100.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	48.4%	12.6%	0.3%	0.1%	2.2%	9.4%	9.0%	14.3%	0.1%	3.6%	100.0%
36 - Freshwater Wetlands*	20.5%	0.0%	0.0%	0.0%	10.7%	11.4%	47.6%	9.5%	0.0%	0.2%	100.0%
37 - Elderslie Banksia Scrub Forest	98.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	100.0%
103 - Shale/Gravel Transition Forest	32.0%	1.0%	0.1%	0.5%	8.5%	25.5%	15.1%	13.8%	0.0%	3.5%	100.0%
152 - Blue Gum High Forest	1.9%	21.6%	6.6%	0.0%	10.6%	22.1%	0.0%	28.4%	3.1%	5.6%	100.0%
TOTAL	**54.9%**	**1.9%**	**0.2%**	**0.9%**	**5.9%**	**14.6%**	**9.7%**	**8.9%**	**0.3%**	**2.7%**	**100.0%**

* Based on zoning information provided by Councils in 1999, in a variety of formats, subject to error in transferring to NPWS systems and changes since data of data capture. Should be considered indicative only.
** Indicates not zoned.
***Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

5 Limitations

Although mapping vegetation using API is currently the most accurate method of mapping vegetation across a large region, there are limitations involved, including:

- clearing and/or regrowth since the date of the photographs will result in errors if the maps are not ground truthed during environmental assessments;
- the accuracy of the photographs. This relates to the range of dates of the photographs and the variations of colours in the photos;
- drawing the boundary of the remnants to create the polygons. This is subjective but has been completed consistently by one person across the study area therefore limiting observer bias;
- accounting for topographic variation which underestimates the area of a polygon. This has been minimised by geo-rectifying the API. This corrects the distortions in the photographs and terrain;
- limitations with geo-referencing the data. Problems have been encountered when placing the remnant boundary to a grid reference on the ground and mapping the boundary polygons to mapped topographical features. There is an estimated error range of 1 –20m of misplacement of data and features; and
- distortion of polygons and effective mapping area. Given the distortion of aerial photographs towards the edge of the photograph an effective mapping area was set to minimise this effect and to obtain a true on ground representation of mapped features.

These limitations have been recognised and every effort was made to minimise them.

The limitations of the modelling of the native vegetation to produce the maps are related to:

- assigning a distinct boundary to communities that have a gradual transition between them;
- using a vegetation modelling program across the Cumberland Plain when the remaining vegetation is highly fragmented and only represents a small portion of the study area. This increases sampling bias and reduces the confidence of the results of the modelled communities especially where some communities are naturally rare and very little remains. Accordingly, those polygons which have a reasonable level of certainty have been assigned a community classification while others have been left as unclassified;
- the vegetation model is limited by the accuracy of the other environmental data layers used in the process. eg. the resolution of the soil landscape layer is at 1:100 000;
- matching the modelled vegetation communities to the API derived remnant polygons. Consistent rules were developed to match community type to polygon where the polygons did not occur wholly within one community; and
- the limitations noted above for the API process.

6 Updating of maps and data layer

The recovery plan for the Cumberland Plain Endangered Ecological Communities will incorporate an updating process for the maps and data layer. This may include the use of satellite images on a regular basis (every 5 or 10 years) to note changes due to clearing or revegetation. Another option may be the maintenance of the data layer for each LGA through each Council maintaining records through the development approval process (consent register)

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Appendices

Appendix 1: Community Descriptions

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Shale Sandstone Transition Communities

1. Shale Sandstone Transition Forest (Low Sandstone Influence)

Sample Sites: (40) APP01BTU, APP02BTU, **APP03BTU**, APP04BTU, **CAD18LUM**, **CAD29BTU**, **CAD33BTM**, **CAM13BTM**, **CAM16BTM**, **CAM29BTC**, **LIV42RIF**, **LIV46BTF**, PAR02BTF, **PIC01LHL**, **PIC03BTM**, **PIC04LUC**, **PIC05BTV**, PIC15BTS, PIC16BTS, PIC17BTV, PIC18BTS, PIC19BTS, PIC20BTU, PIC21BTC, PIC24BTU, **PIC25BTM**, PIC26BTU, PIC27BTM, **PRO19BTL**, **PRO20BTM**, PRO21BTF, WAR11LUM, WAR12LUV, WAR13BTL, WAR14BTU, WAR15LUU, WAR17BTM, WAR18BTU, WAR21BTM, WAR23LU

Examples on Public Land (tenure): Noorumba Nature Reserve (Council); Werombi Cemetery (Council)

Area (ha 1750/1997): 12,828/1,243 **Proportion Extant:** 9.7%
No. Taxa (total/unique): 265/9 **No. Taxa per Plot ($\pm$sd):** 41.3 (8.7)

Shale Sandstone Transition Forest (Low Sandstone Influence) is dominated by *Eucalyptus tereticornis*, with *E. eugenioides, E. crebra, E. fibrosa* and *E. punctata* occurring less frequently. A small tree stratum is usually present and dominated by *Eucalyptus spp.*, with *Allocasuarina littoralis* and *Acacia decurrens* sometimes present. A shrub layer dominated by *Bursaria spinosa* is usually present, frequently this is of high density, although the foliage of this shrub is sparse and does not translate into high cover values. A diverse array of forb species is always present, frequently exceeding 50% in projected foliage cover. Species frequently present in the ground stratum include *Microlaena stipoides var. stipoides, Cheilanthes sieberi subsp. sieberi*, *Dichondra repens*, *Themeda australis*, *Echinopogon ovatus*, *Entolasia marginata*, *Pratia purpurascens*, *Solanum prinophyllum* and *Oxalis perennans*. Although Map Unit 1 marks the start of the transition from the pure shale communities of the Cumberland Plain to the surrounding sandstone communities, it contains relatively few species commonly observed on sandstone derived soils.

Shale Sandstone Transition Forest (Low Sandstone Influence) occurs around the margins of the Cumberland Plain on soils derived from Wianamatta Shale. It is most extensive in the southeastern and southwestern sections of the Study area. The community is only found in close proximity to a transition in parent geology from Wianamatta Shale to high-quartz sedimentary substrates such as the Hawkesbury and Narrabeen group Sandstones, as well as fine to medium grain quartz of the Mittagong formation. In these peripheral areas shale soils form a shallow layer over the underlying sandstone. The majority of sample sites were located within approximately 2km of a sandstone/shale boundary. The community may also be found at greater distances from the sandstone/shale boundary where watercourses have eroded the shale stratum down close to the level of sandstone.

Map Unit 1 is typically found on the middle or upper slopes of gently undulating land. As distance to the sandstone/shale boundary increases Map Unit 1 grades into Map Unit 10 (Shale Plains Woodland) or, less frequently, Map Unit 9 (Shale Hills Woodland). The boundary between these communities is indistinct by nature, and largely unpredictable at the present time. Presumably, the transition to pure shale communities occurs when the depth of the shale substrate exceeds some critical

distance. Map Unit 1 includes areas with only a very slight influence of sandstone. Such areas are exemplified by the sample sites high-lighted in bold text. As distance to the sandstone/shale boundary decreases, Map Unit 1 grades into Map Unit 2, Shale Sandstone Transition Forest (High Sandstone Influence). Again, the boundary between these communities is indistinct and largely arbitrary.

Previous Floristic Classifications:

NPWS (1997) defined two forms of Shale Sandstone Transition Forest; a Western Form, occurring west of Parramatta and an Eastern Form occurring around Auburn and the northern Bankstown district. The Western Form has subsequently been gazetted as an endangered ecological community under the NSW Threatened Species Act (1995), and is officially known as Shale/Sandstone Transition Forest. The Eastern Form falls within the definition of another endangered ecological community; Cooks River/Castlereagh Ironbark Forest (formerly Cooks River Clay Plain Scrub Forest). In this report, Western Shale Sandstone Transition Forest (*sensu* NPWS 1997) is divided into two separate communities reflecting the variation in floristic composition associated with varying shale/sandstone influence. These communities are: Map Unit 1; Shale Sandstone Transition Forest (Low Sandstone Influence) and Map Unit 2; Shale Sandstone Transition Forest (High Sandstone Influence). Map Unit 43 (Turpentine Ironbark Margin Forest) also occurs on soils transitional between Shale and Sandstone, however this community is floristically most similar to Map Unit 15 (Turpentine Ironbark Forest) and falls within the definition of the endangered ecological community, Sydney Turpentine Ironbark Forest. Eastern Shale Sandstone Transition Forest (*sensu* NPWS 1997) is not recognised herein as a form of Shale Sandstone Transition Forest (see Map Unit 3). The community described by Benson and Howell (1994), (Shale/ Sandstone Transition Forest, Map Unit 9r) is described as occurring on the sandstone side of the ecotone and is considered to fall outside the definition of Map Units 1, 2 and 43. However, Bargo Brush Forest (Benson and Howell 1994, Map Unit 9mf) may fall within the definition of either Map Unit 1 or Map Unit 2.

Habitat:

Parent Geology: Wianamatta shale (98%), Holocene Alluvium (2%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January	Distance from sandstone derived soils (m)
Mean ($^{\pm}$sd)	146.8 (80.5)	4.2 (3.3)	847.1 (57.6)	13.5 (6.8)	27.3 (0.6)	214.7 (2.6)	879.1 (1080.6)
Range	1 – 360	0 – 14	764 - 941	0 –36	26 – 28	207 – 219	0 – 4650

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($^{\pm}$sd)	Mean Foliage Cover (%)($^{\pm}$sd)
Tree	100	23.0 (3.9)	24.1 (9.9)
Small Tree	93	12.6 (3.9)	11.0 (8.2)
Shrub	88	3.3 (1.2)	16.1 (16.6)
Forb	100	0.8 (0.6)	49.7 (22.5)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus tereticornis	4	0.525	3	0.295	Positive
Shrub	Grevillea arenaria	1	0.025	0	0	Positive
	Hibbertia linearis	2	0.025	0	0	Positive
	Monotoca ledifolia	2	0.025	0	0	Positive
	Pomaderris eriocephala	1	0.025	0	0	Positive
	Bursaria spinosa	3	0.725	3	0.5669	Constant
Ground	Echinopogon ovatus	2	0.8	2	0.3452	Positive
	Entolasia marginata	2	0.75	2	0.2552	Positive
	Pratia purpurascens	2	0.75	2	0.4184	Positive
	Solanum prinophyllum	2	0.725	2	0.2908	Positive
	Oxalis perennans	2	0.675	2	0.3347	Positive
	Veronica plebeia	2	0.675	2	0.2301	Positive
	Brunoniella australis	2	0.65	3	0.3996	Positive
	Eragrostis leptostachya	2	0.65	2	0.251	Positive
	Desmodium varians	2	0.625	2	0.3975	Positive
	Lepidosperma laterale	2	0.6	2	0.4059	Positive
	Aristida vagans	2	0.55	2	0.4812	Positive
	Opercularia diphylla	2	0.525	2	0.4121	Positive
	Gahnia sieberiana	1	0.025	0	0	Positive
	Hypericum japonicum	1	0.025	0	0	Positive
	Paspalidium gracile	1	0.025	0	0	Positive
	Scaevola aemula	2	0.025	0	0	Positive
	Vittadinia hispidula var. hispidula	1	0.025	0	0	Positive
	Lomandra multiflora subsp. multiflora	1	0.4	2	0.5167	Negative
	Entolasia stricta	2	0.325	3	0.5314	Negative
	Microlaena stipoides var. stipoides	4	0.875	3	0.751	Constant
	Cheilanthes sieberi subsp. sieberi	2	0.825	2	0.5879	Constant
	Dichondra repens	3	0.775	3	0.5335	Constant
	Themeda australis	3	0.775	3	0.6088	Constant
	Glycine tabacina	2	0.525	2	0.3159	Positive
	Passiflora cinnabarina	1	0.025	0	0	Positive
Tree	Eucalyptus eugenioides	4	0.4	2	0.1255	Uninformative
	Eucalyptus crebra	4	0.375	4	0.2029	Uninformative
	Eucalyptus fibrosa	4	0.375	4	0.1632	Uninformative
	Eucalyptus punctata	4	0.325	3	0.251	Uninformative
	Eucalyptus moluccana	4	0.2	4	0.2385	Uninformative
	Angophora floribunda	1	0.15	2	0.08787	Uninformative
	Eucalyptus globoidea	4	0.125	2	0.06067	Uninformative
	Corymbia maculata	4	0.1	4	0.04812	Uninformative
	Angophora bakeri	4	0.075	2	0.1297	Uninformative
	Eucalyptus resinifera	4	0.05	1	0.03556	Uninformative
	Melaleuca decora	1	0.05	3	0.159	Uninformative
	Syncarpia glomulifera	4	0.05	3	0.1234	Uninformative
	Corymbia gummifera	2	0.025	2	0.2385	Uninformative
	Eucalyptus pilularis	5	0.025	4	0.1172	Uninformative
	Eucalyptus saligna	4	0.025	4	0.01464	uninformative
	Eucalyptus sideroxylon	4	0.025	3	0.01046	uninformative

2. Shale Sandstone Transition Forest (High Sandstone Influence)

Sample Sites: (59) APP14BTL, APP21BTM, APP22BTU, APP23BTM, APP24BTM, APP34BTM, APP35BTU, APP37BTU, CAM51LHU, CAM53LHU, CAM56LHU, CAM57LHC, CAM60LHC, CAM80LHM, CAM85LHM, CAM89BTM, CAM93HAL, CAM98BTL, CAM102BT, APP05BTC, APP06BTU, APP07BTC, APP08BTS, APP09BTS, CAD24BTF, CAD30BTM, CAD31BTU, CAM07BTM, CAM08BTC, CAM09BTM, CAM21BTF, CAM22BTM, CAM26LHU, CAM27LHF, CAM28BTC, CAM31BTM, CAM32BTS, CAM37BTL, CAM38BTC, PEN14GYC, RIV27LHC, RIV30GNC, WAR06HAL, WAR07FBC, WAR19BTU, WAR20BTU, WAR24FBL, WAR27GYF, WAR28BTU, WAR29BTU, WAR30BTU, WIL01WLM, WIL05WLC, WIL06WLU, WIL09WLU, WIL13LUU, WIL18WLU (Outliers: PEN22BTV, PEN23BTS)

Examples on Public Land (tenure): Bents Basin Nature Reserve (NPWS); Cattai National Park (NPWS); Wedderburn Road Reserve (Council)

Area (ha 1750/1997): 31,162/8,707 **Proportion Extant:** 27.9%
No. Taxa (total/unique): 359/24 **No. Taxa per Plot ($\pm$sd):** 50.1 (8.4)

Shale Sandstone Transition Forest (High Sandstone Influence) is dominated by *Eucalyptus punctata* and *E. crebra*, with *E. fibrosa*, *Corymbia gummifera* and *Syncarpia glomulifera* occurring less frequently. A smaller tree stratum is usually present and is most often dominated by *Allocasuarina littoralis*, *Syncarpia glomulifera*, *Persoonia linearis* and *Acacia decurrens*. Map Unit 2 usually has a well-developed shrub layer which is more diverse in species than in communities with less sandstone influence in the soil. The shrub stratum is dominated by *Kunzea ambigua*, *Persoonia linearis* and *Bursaria spinosa*, with *Jacksonia scoparia* becoming more common with increasing sandstone influence. The ground stratum is dominated by *Entolasia stricta*, *Themeda australis*, *Stipa pubescens*, *Lepidosperma laterale*, *Aristida vagans* and *Pomax umbellata*.

Map Unit 2 occurs on the margins of the Cumberland Plain in close proximity to the sandstone/shale boundary and is most extensively distributed in the southwest and southeast sectors of the study area. It is also found on the northern and northwestern margins of the Cumberland Plain but was not well sampled in those areas in this study. The majority of sample sites for this community were located within approximately 400 m of the shale/sandstone boundary and varied considerably in the degree of sandstone influence evident in the soil. Map Unit 2 is essentially a shale community, and is most likely to occur on shallow, residual clay soils derived from Wianamatta Shale. However, it may also be found on high-quartz sandstone-derived soils where there is a strong colluvial shale influence (eg the upper slopes of sandstone gullies adjoining shale soils), and on outcrops of pure shale soils derived from the Mittagong Formation. Map Unit 2 occurs primarily on upper slopes and ridges on gently undulating terrain.

Map Unit 2 grades into Map Unit 1, Shale Sandstone Transition Forest (Low Sandstone Influence), with increasing distance from the sandstone/shale boundary. Sometimes this transition is abrupt, and Map Unit 2 grades directly into Map Unit 10 (Shale Plains Woodland). The transition to the sandstone side of the ecotone was best sampled along the western edge of the Georges river in this survey. Here, Map

Unit 2 makes a generally abrupt transition into sandstone communities with a pronounced change in floristic composition

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Previous Floristic Classifications:

Shale Sandstone Transition Forest (High Sandstone Influence) is one of two communities which together correspond to Shale Sandstone Transition Forest as listed on Schedule 2 of the NSW Threatened Species Act (1995). Further discussion is included under the description of Map Unit 1, Shale Sandstone Transition Forest (Low Sandstone Influence).

Habitat:

Parent Geology: Wianamatta shale (53%), Mittagong Formation (31%), Hawkesbury Sandstone (16%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January	Distance from sandstone derived soils (m)
Mean ($\pm$sd)	146.3 (78.2)	4.2 (3.9)	880.0 (46.1)	12.3 (6.8)	27.3 (7.0)	215.0 (2.6)	132.8 (234.1)
Range	14 – 393	0 – 17.7	756 – 981	4 - 43	26.3 – 28.9	204 - 220	0 – 1398.7

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($\pm$sd)	Mean Foliage Cover (%)($\pm$sd)
Tree	100	21.1 (4.4)	19.9 (9.9)
Small Tree	84	10.1 (4.0)	10.9 (9.1)
Shrub	91	3.2 (1.3)	11.6 (10.6)
Forb	96	0.7 (0.7)	33.8 (21.3)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus punctata	3	0.6316	3	0.2104	positive
	Eucalyptus crebra	3	0.614	4	0.167	positive
	Eucalyptus eximia	3	0.05263	0	0	positive
	Eucalyptus notabilis	1	0.05263	0	0	positive
	Eucalyptus beyeriana	2	0.01754	0	0	positive
Shrub	Persoonia linearis	2	0.8947	2	0.2451	positive
	Kunzea ambigua	2	0.6667	2	0.1453	positive
	Pimelea linifolia subsp. linifolia	2	0.6316	2	0.2061	positive
	Ozothamnus diosmifolius	2	0.5965	1	0.2364	positive
	Phyllanthus hirtellus	2	0.5789	2	0.2364	positive
	Hibbertia acicularis	1	0.07018	0	0	positive
	Lasiopetalum ferrugineum var. cordatum	3	0.05263	0	0	positive
	Hibbertia obtusifolia	1	0.03509	0	0	positive
	Persoonia mollis subsp. nectens	2	0.03509	0	0	positive
	Acacia fimbriata	1	0.01754	0	0	positive
	Acacia paradoxa	1	0.01754	0	0	positive
	Acacia trinervata	2	0.01754	0	0	positive
	Baeckea virgata	1	0.01754	0	0	positive

	Calytrix tetragona	1	0.01754	0	0	positive
	Cassinia cunninghamii	1	0.01754	0	0	positive
	Dillwynia phylicoides	1	0.01754	0	0	positive
	Dipodium variegatum	1	0.01754	0	0	positive
	Leucopogon setiger	2	0.01754	0	0	positive
	Olearia elliptica	2	0.01754	0	0	positive
	Pomaderris ligustrina	2	0.01754	0	0	positive
	Pultenaea scabra	1	0.01754	0	0	positive
	Bursaria spinosa	2	0.5965	4	0.577	constant
Ground	Lepidosperma laterale	3	0.9298	2	0.3579	positive
	Aristida vagans	2	0.8947	2	0.436	positive
	Entolasia stricta	3	0.8947	3	0.4685	positive
	Lomandra multiflora subsp. multiflora	2	0.8772	2	0.462	positive
	Pomax umbellata	2	0.8421	2	0.2798	positive
	Panicum simile	2	0.807	2	0.2798	positive
	Pratia purpurascens	2	0.7544	2	0.4056	positive
	Echinopogon caespitosus var. caespitosus	2	0.7368	2	0.2451	positive
	Stipa pubescens	3	0.6316	3	0.1757	positive
	Dianella revoluta var. revoluta	2	0.5614	2	0.3319	positive
	Opercularia diphylla	2	0.5263	2	0.4078	positive
	Goodenia hederacea subsp. hederacea	2	0.5088	2	0.3362	positive
	Calandrinia calyptrata	2	0.01754	0	0	positive
	Gahnia filifolia	1	0.01754	0	0	positive
	Goodenia heterophylla	1	0.01754	0	0	positive
	Hybanthus vernonii	1	0.01754	0	0	positive
	Dichondra repens	2	0.3333	3	0.5792	negative
	Microlaena stipoides var. stipoides	2	0.8246	3	0.7527	constant
	Cheilanthes sieberi subsp. sieberi	2	0.807	2	0.5813	Constant
	Themeda australis	3	0.7719	3	0.603	Constant
	Glycine clandestina	2	0.7719	2	0.4013	Positive
	Billardiera scandens	2	0.7193	1	0.2777	Positive
	Hardenbergia violacea	2	0.5614	1	0.2842	Positive
Tree	Eucalyptus fibrosa	4	0.386	4	0.154	Uninformative
	Corymbia gummifera	2	0.3333	2	0.2082	Uninformative
	Syncarpia glomulifera	4	0.3158	3	0.09328	Uninformative
	Angophora bakeri	1	0.2105	2	0.115	Uninformative
	Eucalyptus eugenioides	3	0.193	2	0.141	Uninformative
	Eucalyptus pilularis	1	0.1754	4	0.102	Uninformative
	Corymbia maculata	4	0.1579	4	0.03905	Uninformative
	Eucalyptus globoidea	2	0.1579	2	0.05423	Uninformative
	Angophora floribunda	2	0.1053	2	0.09111	Uninformative
	Eucalyptus oblonga	2	0.1053	2	0.06291	Uninformative
	Eucalyptus tereticornis	3	0.1053	4	0.3384	Uninformative
	Angophora costata	1	0.08772	3	0.1302	Uninformative
	Eucalyptus resinifera	1	0.08772	2	0.03037	Uninformative
	Eucalyptus sclerophylla	1	0.05263	4	0.1128	Uninformative
	Eucalyptus longifolia	1	0.01754	1	0.01518	Uninformative
	Eucalyptus moluccana	1	0.01754	4	0.2625	Uninformative

Tertiary Alluvium Communities

3. Cooks River/Castlereagh Ironbark Forest

Sample Sites: (23) **BOT12BGF**, **BOT01BGF**, **BOT02BTF**, **BOT04BGF**, LIV15BPF, **LIV17BPF**, **LIV20BPF**, LIV27BPM, **LIV40BTF**, LIV43RIF, **LIV44BPF**, LIV48BTM, PAR01BGF, RIV01BPS, RIV02BPF, RIV04BTF, RIV06BTM, RIV07BPL, RIV08BPL, RIV13BPF, SPR01BPF, SPR05ABF, SPR15LUM

Examples on Public Land (tenure): Norfolk Reserve (Council); Duck River Reserve (Council); Lousia Reserve (Council), Castlereagh Nature Reserve (NPWS); Windsor Downs Nature Reserve (NPWS); Agnes Banks Nature Reserve (NPWS).

Area (ha 1750/1997): 12,185/1,012 **Proportion Extant:** 8.3%
No. Taxa (total/unique): 230/6 **No. Taxa per Plot ($\pm$sd):** 41.9 (6.2)

Cooks River/Castlereagh Ironbark Forest is dominated by *Eucalyptus fibrosa* and *Melaleuca decora*, with *E. longifolia* occurring at lower frequency. The height of the overstorey is relatively variable and often merges into a smaller tree stratum dominated by the same species. A relatively dense shrub stratum is typical, and dominated by *M. nodosa* and *Lissanthe strigosa*, and to a lesser extent *M. decora*. A variety of shrub species occur at relatively low frequencies, including *Acacia pubescens, Dillwynia tenuifolia, Daviesia ulicifolia, Pultenea villosa* and *Grevillea juniperina*. The ground stratum is relatively sparse compared to adjoining communities on tertiary alluvium or shale soils. Commonly occurring species include *Entolasia stricta, Lepidosperma laterale, Opercularia diphylla, Dianella revoluta subsp. revoluta, Themeda australis, Microlaena stipoides var. stipoides* and *Pratia purpurascens*.

Cooks River/Castlereagh Ironbark Forest primarily occurs on clay soils derived from Tertiary Alluvium, or on shale soils adjacent to the boundary with Tertiary Alluvium. The most extensive stands occur in the Castlereagh and Holsworthy areas. A small patch occurs in the Kemps Creek area on an isolated fragment of Tertiary Alluvium. Where the Tertiary Alluvium is shallow, the vegetation is influenced by the underlying shale and the community grades into Map Unit 103, Shale Gravel Transition Forest. This transition is difficult to predict and may be influenced by other factors such as drainage. In very poorly drained depressions, Map Unit 3 may grade into Map Unit 4, Castlereagh Swamp Woodland. Where the soil is sandier Map Unit 3 grades into Map Unit 6, Castlereagh Woodland. In the Castlereagh area this often occurs on terrain with slightly higher elevation.

A series of isolated, highly modified remnants of this community on the eastern side of the Cumberland Plain have previously been recognised as Cooks River Clay Plain Scrub Forest (Map Unit 3a.in NSW NPWS 2000b). These sites were less frequently dominated By *E. fibrosa* and would be more accurately described as a woodland of *E. longifolia, E. fibrosa* and more rarely, *Angophora floribunda* and *E.oblonga*, but sometimes had no tree stratum at all. The shrub stratum was often dense, particularly in the absence of overstorey, and dominated by *Melaleuca nodosa* and *Bursaria spinosa*. These remnants are apparently remote from deposits of Tertiary Alluvium, but occur in an area described as having a high concentration

of iron-indurated gravel in the soil (Villawood Soil Series; Walker 1960) (See Discussion). Slight floristic differences between sample sites in this area and sample sites further to the west and southwest may be due to the higher influence of shale in the soil or higher rainfall. The highly modified and isolated nature of these remnants is also likely to have contributed to floristic differences.

Previous Floristic Classifications:

Cooks River/Castlereagh Ironbark Forest, listed as endangered under the *Threatened Species Conservation Act 1995*, corresponds to the communities described as Castlereagh Ironbark Forest and Cooks River Clay Plain Scrub Forest by Benson (1992), (Map Unit 9e), and NPWS (1997), although differences exist in the extent of distribution recognised. These differences are primarily related to problems associated with classifying sites in a zone of transitional vegetation, and mainly involve areas being recognised as Cooks River/Castlereagh Ironbark Forest by one author and transitional by another.

Examples of the former Cooks River Clay Plain Scrub Forest surveyed in the present study include parts of Rookwood Cemetery in Chullora, Norfolk Park in Greenacre, Louisa Reserve in Bass Hill, and remnants in the Moorebank, Holsworthy and the upper reaches of Salt Pan Creek. Benson (1992) included some of these remnants under Map Unit 9d, Shale/Gravel Transition Forest, while NPWS (1997) ascribed some to Shale/Gravel Transition Forest and some to Eastern Shale Sandstone Transition Forest. A comment on the final determination listing Shale/Sandstone Transition Forest as an endangered ecological community attributes most of NPWS' (1997) Eastern Shale Sandstone Transition Forest to the endangered ecological community Cooks River Clay Plain Scrub Forest (and thus Cooks River/Castlereagh Ironbark Forest).

This survey distinguished remnants of both Shale Sandstone Transition Forest (Map Units 1 and 2; Low and High Sandstone Influence) and Cooks River/Castlereagh Ironbark Forest between Bankstown and Strathfield.

Habitat:

Parent Geology: Tertiary Alluvium (52%), Holocene Alluvium (18%), Wianamatta Shale (30%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January
Mean ($\pm$sd)	28.7 (16.5)	1.1 (0.8)	853.6 (53.5)	3.3 (1.1)	27.9 (0.8)	217.4 (1.0)
Range	1 – 61	0 - 2.3	799 - 960	1 – 5	26.7 – 29.1	216 - 219

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($\pm$sd)	Mean Foliage Cover (%)($\pm$sd)
Tree	100	20.0 (7.5)	18.9 (11.0
Small Tree	74	10.9 (4.0)	14.3 (10.8)
Shrub	100	3.7 (2.2)	34.8 (23.4)
Forb	100	0.4 (0.5)	17.9 (15.1)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Melaleuca decora	4	0.913	3	0.1152	positive
	Eucalyptus fibrosa	4	0.7391	4	0.1535	positive
Shrub	Melaleuca nodosa	4	0.8261	3	0.07475	positive
	Lissanthe strigosa	3	0.6522	2	0.1899	positive
	Dodonaea falcata	3	0.1304	0	0	positive
	Acacia echinula	3	0.04348	0	0	positive
	Pultenaea villifera	1	0.04348	0	0	positive
	Bursaria spinosa	2	0.4783	3	0.5838	negative
Ground	Entolasia stricta	3	0.913	3	0.497	positive
	Lepidosperma laterale	3	0.8696	2	0.4	positive
	Opercularia diphylla	2	0.8261	2	0.402	positive
	Dianella revoluta var. revoluta	2	0.7391	2	0.3394	positive
	Pratia purpurascens	2	0.7391	2	0.4303	positive
	Aristida vagans	2	0.6957	2	0.4768	positive
	Danthonia tenuior	2	0.6522	2	0.1859	positive
	Goodenia hederacea subsp. hederacea	2	0.6087	2	0.3434	positive
	Panicum simile	2	0.6087	2	0.3253	positive
	Laxmannia gracilis	2	0.5652	1	0.1838	positive
	Eragrostis brownii	2	0.5217	2	0.2141	positive
	Vernonia cinerea var. cinerea	2	0.5217	2	0.202	positive
	Deyeuxia quadriseta	1	0.04348	0	0	positive
	Dichondra repens	3	0.3043	3	0.5636	negative
	Microlaena stipoides var. stipoides	3	0.913	3	0.7535	constant
	Cheilanthes sieberi subsp. sieberi	2	0.8696	2	0.5939	constant
	Lomandra multiflora subsp. multiflora	3	0.6522	2	0.501	constant
	Themeda australis	3	0.6087	3	0.6222	constant
	Dendrophthoe vitellina	1	0.1304	0	0	positive
	Billardiera scandens	2	0.5217	1	0.3172	positive
	Cuscuta australis	2	0.08696	0	0	positive
Tree	Eucalyptus longifolia	1	0.2609	1	0.00404	uninformative
	Angophora floribunda	4	0.08696	2	0.09293	uninformative
	Eucalyptus eugenioides	1	0.08696	2	0.1495	uninformative
	Eucalyptus globoidea	3	0.08696	2	0.06465	uninformative
	Eucalyptus moluccana	2	0.08696	4	0.2424	uninformative
	Eucalyptus sclerophylla	3	0.08696	4	0.1071	uninformative
	Eucalyptus tereticornis	1	0.08696	4	0.3232	uninformative
	Syncarpia glomulifera	2	0.08696	3	0.1192	uninformative
	Angophora bakeri	2	0.04348	2	0.1293	uninformative
	Angophora subvelutina	1	0.04348	4	0.03636	uninformative
	Eucalyptus crebra	1	0.04348	4	0.2242	uninformative
	Eucalyptus oblonga	4	0.04348	2	0.06869	uninformative
	Eucalyptus parramattensis subsp. Parramattensis	1	0.04348	2	0.04242	uninformative
	Eucalyptus resinifera	4	0.04348	1	0.03636	uninformative
	Eucalyptus sideroxylon	1	0.04348	4	0.0101	uninformative

103. Shale Gravel Transition Forest

Sample Sites: (25) LIV63SCF, CAM01LHF, CAM02LHM, KUR16ABF, LIV12BTF, LIV14BTF, LIV19BPF, LIV23BPF, LIV24BTF, LIV30LHF, LIV31LHV, LIV32LHM, LIV33LHV, PEN15BPM, RIV05BPL, RIV09BPL, RIV10BPF, RIV11BPF, RIV14BPF, RIV16BPL, RIV17BPC, RIV22BTF, RIV28BPF, RIV29BPV, SPR16BPM

Examples on Public Land (tenure): Windsor Downs Nature Reserve (NPWS); Kemps Creek nature reserve proposal (NPWS)

Area (ha 1750/1997): 5427/1721 **Proportion Extant:** 31.7%
No. Taxa (total/unique): 216/1 **No. Taxa per Plot (±sd):** 45.1 (7.1)

Shale Gravel Transition Forest is usually dominated by *Eucalyptus fibrosa* with *E. moluccana* and *E. tereticornis* occurring less frequently, but sometimes dominating in the absence of *E. fibrosa*. *Melaleuca decora* is frequently present in a small tree stratum. A sparse shrub stratum is usually present and typically includes species such as *Bursaria spinosa*, *Daviesia ulicifolia* and *Lissanthe strigosa*. A variety of forb species were recorded with high frequency, including *Microlaena stipoides* subsp. *stipoides, Cheilanthes sieberi* subsp. *sieberi, Themeda australis, Opercularia diphylla, Lomandra multiflora* subsp. *multiflora, Aristida vagans, Pratia purpurascens and Wahlenbergia gracilis.*

Shale Gravel Transition Forest occurs primarily in areas where shallow deposits of tertiary alluvium overlie shale soils, but also in association with localised concentrations of iron-indurated gravel. Iron-stone accretions are more resistant to weathering than shale and may become concentrated on ridgelines in the course of long-term erosion. This community is also likely to have been found in the Auburn – Bankstown area in association with the gravels of the Villawood soil series (Walker 1960), although native vegetation in this area has been extensively cleared. Shale Gravel Transition Forest grades into Shale Plains Woodland as alluvial and ironstone influences decline. On thicker deposits of tertiary alluvium it grades into Cooks River/Castlereagh Ironbark Forest or Castlereagh Scribbly Gum Woodland. South of the tertiary alluvial deposits at Holsworthy, this community apparently occurs on soils of the Mittagong Formation, and forms complex mosaics with shale/sandstone transitional communities.

Previous Floristic Classifications:
Shale Gravel Transition Forest, listed as endangered under the *Threatened Species Conservation Act 1995*, corresponds to the community of the same name described by Benson (1992), (Map Unit 9d), and NPWS (1997), although differences exist in the extent of distribution recognised. These differences are primarily related to problems associated with classifying sites in a zone of transitional vegetation, and mainly involve areas being recognised as Cooks River/Castlereagh Ironbark Forest by one author and transitional by another.

Habitat

Parent Geology: Tertiary Alluvium (47%), Mittagong Formation (30%), Wianamatta Shale (14%), Holocene Alluvium (3%), Aeolian Deposits (3%), Hawkesbury sandstone (3%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January
Mean ($^{\pm}$sd)	35.3 (16.8)	1.6 (1.8)	845.3 (50.9)	5.4 (5.7)	28.0 (0.7)	217.0 (0.7)
Range	19 – 78	0 – 7.4	788 - 968	2 – 31	26.9 – 29.0	215 – 218

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($^{\pm}$sd)	Mean Foliage Cover (%)($^{\pm}$sd)
Tree	100	21.9 (2.4)	20.3 (10.4)
Small Tree	68	11.2 (3.0)	8.4 (5.9)
Shrub	76	3.3 (1.5)	13.6 (14.5)
Forb	100	0.6 (0.5)	44.6 (24.6)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus fibrosa	4	0.64	4	0.1562	positive
	Melaleuca decora	4	0.64	3	0.1258	positive
Shrub	Daviesia ulicifolia	2	0.68	2	0.1318	positive
	Lissanthe strigosa	2	0.52	2	0.1947	positive
	Bursaria spinosa	3	0.84	3	0.5659	constant
Ground	Opercularia diphylla	3	0.96	2	0.3935	positive
	Lomandra multiflora subsp. multiflora	2	0.92	2	0.4868	positive
	Aristida vagans	2	0.88	2	0.4665	positive
	Pratia purpurascens	2	0.84	2	0.4239	positive
	Wahlenbergia gracilis	2	0.76	2	0.3651	positive
	Poranthera microphylla	3	0.72	2	0.286	positive
	Desmodium varians	3	0.68	2	0.4016	positive
	Dichelachne micrantha	3	0.68	2	0.357	positive
	Goodenia hederacea subsp. hederacea	2	0.68	2	0.3387	positive
	Lomandra filiformis subsp. filiformis	3	0.68	2	0.3002	positive
	Brunoniella australis	3	0.6	3	0.4097	positive
	Dianella revoluta var. revoluta	3	0.56	2	0.3469	positive
	Hypericum gramineum	2	0.56	2	0.211	positive
	Lepidosperma laterale	3	0.56	2	0.4138	positive
	Oxalis perennans	2	0.56	2	0.3509	positive
	Panicum simile	3	0.56	2	0.3266	positive
	Danthonia tenuior	3	0.52	2	0.1907	positive
	Dianella longifolia	2	0.52	2	0.2191	positive
	Echinopogon ovatus	2	0.52	2	0.3732	positive
	Laxmannia gracilis	2	0.52	1	0.1846	positive
	Pomax umbellata	3	0.52	2	0.3327	positive
	Tricoryne elatior	3	0.52	2	0.1866	positive
	Vernonia cinerea var. cinerea	2	0.52	2	0.2008	positive

	Microtis parviflora	1	0.04	0	0	positive
	Microlaena stipoides var. stipoides	3	1	3	0.7485	constant
	Cheilanthes sieberi subsp. sieberi	3	0.92	2	0.5903	constant
	Themeda australis	4	0.84	3	0.6105	constant
	Entolasia stricta	3	0.8	3	0.501	constant
	Dichondra repens	3	0.68	3	0.5456	constant
	Glycine clandestina	2	0.68	2	0.43	positive
Tree	Eucalyptus moluccana	4	0.4	4	0.2272	uninformative
	Eucalyptus tereticornis	4	0.4	4	0.3083	uninformative
	Eucalyptus crebra	4	0.36	4	0.2089	uninformative
	Eucalyptus eugenioides	1	0.24	2	0.142	uninformative
	Eucalyptus globoidea	3	0.12	2	0.06288	uninformative
	Angophora floribunda	4	0.08	2	0.09331	uninformative
	Eucalyptus punctata	4	0.08	3	0.2657	uninformative
	Eucalyptus sclerophylla	4	0.08	4	0.1075	uninformative
	Angophora bakeri	4	0.04	2	0.1298	uninformative
	Angophora subvelutina	1	0.04	4	0.03651	uninformative
	Corymbia maculata	1	0.04	4	0.05274	uninformative
	Eucalyptus sparsifolia	5	0.04	4	0.004057	uninformative
	Syncarpia glomulifera	1	0.04	3	0.1217	uninformative

4. Castlereagh Swamp Woodland

Sample Sites: (7) CAD07BTV, LIV13SCF, LIV18BPV, LIV22BPD, RIV18BPF, SPR12BPF, SPR28BPF

Examples on Public Land (tenure): Windsor Downs Nature Reserve (NWPS); Kemps Creek nature reserve proposal (NPWS)

Area (ha 1750/1997): 1006/616 **Proportion Extant:** 61.2%
No. Taxa (total/unique): 142/10 **No. Taxa per Plot ($\pm$sd):** 43.9 (7.9)

Castlereagh Swamp Woodland is dominated by medium to dense stands of *Melaleuca decora* with populations exhibiting a range in height from shrubs of 2 - 4 m to trees of 15 – 20 m. *Eucalyptus fibrosa*, *Angophora subvelutina* and *Melaleuca linariifolia* are present less frequently in both the tree and small tree strata. *Eucalyptus parramattensis subsp parramattensis* is frequently present, but is usually represented by only a few individuals. Map Unit 4 has a poorly developed shrub layer consisting of young individuals of *M. decora*, *M. linariifolia* and, more occasionally, *Bursaria spinosa* at low cover/abundance. The Ground stratum is often dense and diverse, and includes species tolerant of water-logged conditions such as *Goodenia paniculata, Schoenus apogon, Centella asiatica* and *Juncus usitatus*.

Castlereagh Swamp Woodland occurs in poorly drained depressions on soils derived from Tertiary Alluvium, or on adjacent shale soils where the influence of Tertiary Alluvium is strong. The distribution is highly restricted, with the two main examples occurring in the Castlereagh and Holsworthy areas. Map Unit 4 was also identified at a sample site in the vicinity of Tertiary Alluvial deposits at Kemps Creek. An outlying sample is located north of Camden near the Nepean River, possibly related to Tertiary Alluvium associated with the Theresa Park soil landscape. In better drained areas Map Unit 4 grades into Map Unit 6, Castlereagh Woodland, and sometimes into Map Unit 3, Cooks River/Castlereagh Ironbark Forest.

Previous Floristic Classifications:
Castlereagh Swamp Woodland corresponds to the community of the same name described by Benson (1992), (Map Unit 14c), and NPWS (1997), although differences exist in the extent of distribution recognised. In particular, this community is more restricted in distribution than previously described in the Castlereagh area. Castlereagh Swamp Woodland is listed as an endangered ecological community under the NSW Threatened Species Act.

Habitat:
Parent Geology: Tertiary Alluvium (57%), Wianamatta Shale (29%), Aeolian Deposits (14%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January
Mean ($\pm$sd)	30.1 (17.8)	1.5 (3.1)	807.4 (47.3)	3.1 (2.7)	28.3 (7.0)	21.7 (0.1)
Range	12 – 60	0 – 8.4	729 – 871	1 – 9	27.4 – 29.1	216 - 218

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	17.6 (5.1)	24.0 (19.4)
Small Tree	57	11.5 (1.0)	17.5 (9.6)
Shrub	100	4.1 (1.7)	5.9 (4.2)
Forb	86	0.7 (0.5)	53.2 (35.2)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Melaleuca decora	5	0.8571	3	0.1409	positive
Shrub	Bursaria spinosa	2	0.4286	3	0.5812	negative
Ground	Goodenia paniculata	3	1	2	0.01957	positive
	Schoenus apogon	2	1	2	0.02348	positive
	Centella asiatica	3	0.8571	2	0.1252	positive
	Juncus usitatus	3	0.8571	2	0.1233	positive
	Opercularia diphylla	2	0.8571	2	0.4149	positive
	Pratia purpurascens	3	0.8571	2	0.4384	positive
	Agrostis avenacea var. avenacea	3	0.7143	1	0.1096	positive
	Gratiola pedunculata	2	0.7143	0	0	positive
	Hydrocotyle peduncularis	3	0.7143	2	0.09785	positive
	Hypericum gramineum	2	0.7143	2	0.2211	positive
	Poranthera microphylla	2	0.7143	2	0.3014	positive
	Eragrostis brownii	2	0.5714	2	0.2231	positive
	Fimbristylis dichotoma	3	0.5714	2	0.08806	positive
	Hypoxis hygrometrica	2	0.5714	2	0.1292	positive
	Lomandra longifolia	4	0.5714	2	0.2838	positive
	Cyperus flaccidus	2	0.1429	0	0	positive
	Cyperus sanguinolentus	2	0.1429	0	0	positive
	Eleocharis dietrichiana	2	0.1429	0	0	positive
	Juncus australis	2	0.1429	0	0	positive
	Juncus fockei	2	0.1429	0	0	positive
	Lipocarpha microcephala	2	0.1429	0	0	positive
	Nymphoides geminata	2	0.1429	0	0	positive
	Potamogeton tricarinatus	3	0.1429	0	0	positive
	Pratia surrepens	1	0.1429	0	0	positive
	Cheilanthes sieberi subsp. sieberi	2	0.8571	2	0.6027	constant
	Microlaena stipoides var. stipoides	3	0.8571	3	0.7593	constant
	Themeda australis	2	0.8571	3	0.6184	constant
	Dichondra repens	2	0.7143	3	0.5499	constant
	Lomandra multiflora subsp. multiflora	2	0.7143	2	0.5049	constant
	Entolasia stricta	3	0.5714	3	0.5147	constant
Tree	Eucalyptus parramattensis subsp. Parramattensis	1	0.5714	4	0.03523	uninformative
	Angophora subvelutina	4	0.2857	4	0.03327	uninformative
	Eucalyptus amplifolia	1	0.2857	4	0.05479	uninformative
	Eucalyptus fibrosa	4	0.2857	4	0.1781	uninformative
	Eucalyptus tereticornis	4	0.2857	4	0.3131	uninformative
	Angophora floribunda	4	0.1429	2	0.09198	uninformative
	Eucalyptus eugenioides	1	0.1429	2	0.1468	uninformative
	Eucalyptus sclerophylla	1	0.1429	4	0.1057	uninformative
	Eucalyptus sideroxylon	4	0.1429	3	0.009785	uninformative

6. Castlereagh Scribbly Gum Woodland

Sample Sites: (20) LIV26BPF, LIV45RIV, RIV03BPM, RIV23BTF, SPR02BPF, SPR03BPF, SPR07BPV, SPR08BPL, SPR09BPF, SPR10BPF, SPR11BPF, SPR13BPF, SPR17BPF, SPR22BPF, SPR23BPF, SPR24BPF, SPR25BPF, SPR26BPF, SPR27BPF, SPR29BPC

Examples on Public Land (tenure): Castlereagh Nature Reserve (NPWS)

Area (ha 1750/1997): 5852/3083 **Proportion Extant:** 52.7%
No. Taxa (total/unique): 201/15 **No. Taxa per Plot ($\pm$sd):** 47.9 (8.0)

Castlereagh Scribbly Gum Woodland is dominated by *Eucalyptus parramattensis subsp. parramattensis, Angophora bakeri* and *E. sclerophylla*. A small tree stratum of *Melaleuca decora* is sometimes present, generally in areas with poorer drainage. It has a well developed shrub stratum consisting of sclerophyllous species such as *Banksia spinulosa subsp spinulosa, M. nodosa, Hakea sericea* and *H. dactyloides* (multi-stemmed form). The ground stratum contains a diverse range of forbs including *Themeda australis, Entolasia stricta, Cyathochaeta diandra, Dianella revoluta subsp revoluta, Stylidium graminifolium, Platysace ericoides, Laxmannia gracilis* and *Aristida warburgii.*

Castlereagh Scribbly Gum Woodland occurs almost exclusively on soils derived from Tertiary Alluvium, with a small number of sample sites located on adjoining shale or holocene alluvium where, presumably, the influence of Tertiary Alluvium is strong. It is most often found on sandy soils and, at least in the heart of the Castlereagh area, tends to occur on slightly higher ground (>27 m) than Map Units 3 (Cooks River/Castlereagh Ironbark Forest) and 103 (Shale Gravel Transition Forest) which it adjoins. The Castlereagh Nature Reserve is an exception to this rule with Cooks River/Castlereagh Ironbark Forest occurring on an area of localised, elevated clay soil. Map Unit 6 grades into either Map Unit 3 or Map Unit 103 with decreasing distance from the Shale/Tertiary Alluvium Boundary. The transition is unpredictable at present, but appears to be a function of the interaction of localised drainage conditions and the thickness of the Tertiary Alluvium mantle. The main occurrence of Castlereagh Scribbly Gum Woodland is in the Castlereagh Area, with small patches occurring at Kemps Creek and Longneck Lagoon. This community is also present around Holsworthy, however the floristic composition in this area is closer to Map Unit 3 than at other localities.

Previous Floristic Classifications:
Castlereagh Scribbly Gum Woodland corresponds to the community of the same name described by Benson (1992), (Map Unit 14a), and NPWS (1997).

Habitat:
Parent Geology: Tertiary Alluvium (90%), Holocene Alluvium (5%), Wianamatta Shale (5%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January
Mean ($^{\pm}$sd)	33.1 (10.7)	0.7 (0.7)	812.4 (26.2)	2.1 (0.9)	28.8 (4.5)	216.3 (0.7)
Range	7 – 63	0 – 1.6	781 – 917	0 - 4	27.1 – 29.0	216 – 218

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($^{\pm}$sd)	Mean Foliage Cover (%)($^{\pm}$sd)
Tree	100	13.8 (3.1)	15.1 (8.9)
Small Tree	40	8.4 (3.5)	7.5 (2.9)
Shrub	100	2.2 (0.9)	22.2 (11.6)
Forb	100	0.7 (0.5)	33.8 (30.1)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus parramattensis subsp. parramattensis	4	0.8	1	0.01205	Positive
	Angophora bakeri	3	0.7	2	0.1024	Positive
	Eucalyptus sclerophylla	4	0.65	4	0.08434	Positive
	Melaleuca decora	4	0.6	3	0.1325	Positive
Shrub	Banksia spinulosa	3	0.9	2	0.1586	Positive
	Melaleuca nodosa	4	0.9	3	0.07631	Positive
	Hakea sericea	3	0.85	2	0.1446	Positive
	Pimelea linifolia subsp. linifolia	2	0.85	2	0.2289	Positive
	Hakea dactyloides	2	0.75	2	0.1064	positive
	Leptospermum trinervium	2	0.55	2	0.2149	positive
	Acacia brownii	2	0.5	1	0.0261	positive
	Acacia elongata	2	0.5	2	0.02811	positive
	Daviesia ulicifolia	2	0.5	2	0.1446	positive
	Micromyrtus ciliata	2	0.45	0	0	positive
	Micromyrtus minutiflora	2	0.15	0	0	positive
	Acacia bynoeana	1	0.05	0	0	positive
	Gonocarpus micranthus	2	0.05	0	0	positive
	Hovea longifolia	2	0.05	0	0	positive
	Leptospermum continentale	2	0.05	0	0	positive
	Melichrus urceolatus	2	0.05	0	0	positive
	Sphaerolobium vimineum	4	0.05	0	0	positive
Ground	Entolasia stricta	3	0.95	3	0.498	positive
	Cyathochaeta diandra	3	0.9	2	0.1426	positive
	Eragrostis brownii	2	0.75	2	0.2068	positive
	Gonocarpus tetragynus	3	0.75	2	0.1888	positive
	Lomandra multiflora subsp. multiflora	2	0.75	2	0.498	positive
	Xanthorrhoea minor subsp. minor	2	0.75	1	0.0261	positive
	Dianella revoluta var. revoluta	2	0.7	2	0.3434	positive
	Opercularia diphylla	2	0.7	2	0.4096	positive
	Stylidium graminifolium	3	0.7	1	0.06225	positive
	Hypericum gramineum	2	0.6	2	0.2129	positive
	Laxmannia gracilis	2	0.6	1	0.1847	positive
	Panicum simile	2	0.6	2	0.3273	positive
	Platysace ericoides	2	0.6	2	0.07229	positive
	Aristida warburgii	2	0.55	1	0.01205	positive
	Lepyrodia scariosa	3	0.5	2	0.04819	positive
	Amphipogon strictus var. strictus	1	0.05	0	0	positive

	Centrolepis strigosa	1	0.05	0	0	positive
	Cyperus haspan subsp. haspan	2	0.05	0	0	positive
	Drosera spatulata	2	0.05	0	0	positive
	Eleocharis philippinensis	2	0.05	0	0	positive
	Pimelea linifolia subsp. collina	4	0.05	0	0	positive
	Schoenus paludosus	1	0.05	0	0	positive
	Bursaria spinosa	0	0	3	0.6024	negative
	Dichondra repens	0	0	3	0.5743	negative
	Themeda australis	3	0.85	3	0.6124	constant
	Microlaena stipoides var. stipoides	2	0.7	3	0.7631	constant
	Cheilanthes sieberi subsp. sieberi	2	0.55	2	0.6084	constant
	Cassytha glabella form glabella	2	0.6	2	0.1486	positive
Tree	Eucalyptus fibrosa	3	0.15	4	0.1807	uninformative
	Eucalyptus sideroxylon	3	0.15	4	0.006024	uninformative
	Corymbia gummifera	4	0.1	2	0.2269	uninformative
	Eucalyptus eugenioides	3	0.05	2	0.1506	uninformative

8. Agnes Banks Woodland

Sample Sites: (2) SPR04ABF, SPR06ABF

Community Examples on Public Land (tenure): Agnes Banks Nature Reserve (NPWS)

Area (ha 1750/1997): 615/98 **Proportion Extant:** 15.9%
No. Taxa (total/unique): 52/5 **No. Taxa per Plot (±sd):** 33.0 (4.2)

Map Unit 8 is a low woodland dominated By *Eucalyptus sclerophylla* and *Angophora bakeri* with a diverse understorey of sclerophyllous shrub species. These include *Banksia oblongifolia, B. aemula, Conospermum taxifolium, Leptospermum trinervium, Dillwynia sericea, Monotoca scoparia and Persoonia nutans*. The ground stratum includes *Lepidosperma urophorum, Platysace ericoides, Pimelea linifolia* subsp *linifolia, Mitrasacme polymorpha, Trachymene incisa* subsp. *incisa* and *Stylidium graminifolium*.

This community, listed as endangered under the *Threatened Species Conservation Act 1995*, is restricted to small areas of sand dunes overlying Tertiary Alluvium at Agnes Banks on the east bank of the Hawkesbury River. In low-lying, poorly drained areas Map Unit 8 grades into Map Unit 3 (Cooks River/Castlereagh Ironbark Forest). On higher ground where the aeolian sand deposits overly sandy alluvial soils the transition is to Map Unit 6 (Castlereagh Scribbly Gum Woodland), to which Map Unit 8 is closely related floristically.

Previous Floristic Classifications:

Habitat:

Parent Geology: Aeolian Deposits (100%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	30.5 (0.7)	0.6 (0.9)	803.0 (0.0)	1.0 (0.0)	29.1 (0.0)	216.0 (0.0)
Range	30 – 31	0 – 1.3	0 – 803	1 – 1	29.1 – 29.1	216 - 216

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	15.0 (0.0)	12.5 (3.5)
Small Tree	50	8.0 (-)	20.0 (-)
Shrub	100	3.3 (2.5)	26.7 (5.8)
Forb	100	0.1 (0.0)	22.5 (24.7)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Angophora bakeri	5	1	2	0.1221	positive
	Eucalyptus sclerophylla	4	1	4	0.1027	positive
Shrub	Banksia oblongifolia	3	1	2	0.02519	positive

	Conospermum taxifolium	3	1	1	0.001938	positive
	Dillwynia sericea	2	1	1	0.00969	positive
	Leptospermum trinervium	3	1	2	0.2248	positive
	Monotoca scoparia	3	1	1	0.1105	positive
	Persoonia nutans	2	1	1	0.01744	positive
	Pimelea linifolia subsp. linifolia	3	1	2	0.25	positive
	Amperea xiphoclada	3	0.5	1	0.01357	positive
	Baeckea diosmifolia	2	0.5	1	0.001938	positive
	Banksia aemula	4	0.5	0	0	positive
	Bossiaea rhombifolia subsp. rhombifolia	3	0.5	2	0.00969	positive
	Brachyloma daphnoides	3	0.5	2	0.03295	positive
	Callistemon citrinus	1	0.5	0	0	positive
	Callistemon linearis	2	0.5	1	0.01938	positive
	Hibbertia fasciculata	2	0.5	1	0.001938	positive
	Isopogon anemonifolius	2	0.5	2	0.1085	positive
	Kunzea capitata	3	0.5	2	0.01357	positive
	Leptospermum polygalifolium subsp. polygalifolium	4	0.5	2	0.06008	positive
	Olax stricta	2	0.5	0	0	positive
	Philotheca salsolifolia	3	0.5	2	0.001938	positive
	Ricinocarpos pinifolius	3	0.5	1	0.03876	positive
Ground	Lepidosperma urophorum	3	1	2	0.007752	positive
	Mitrasacme polymorpha	2	1	2	0.01744	positive
	Platysace ericoides	3	1	2	0.08915	positive
	Stylidium graminifolium	3	1	2	0.08333	positive
	Trachymene incisa subsp. incisa	3	1	3	0.03876	positive
	Caleana major	3	0.5	0	0	positive
	Cyathochaeta diandra	4	0.5	2	0.1705	positive
	Dianella revoluta var. revoluta	2	0.5	2	0.3566	positive
	Haemodorum corymbosum	2	0.5	1	0.01163	positive
	Lepidosperma laterale	2	0.5	2	0.4205	positive
	Leptocarpus tenax	4	0.5	0	0	positive
	Lepyrodia scariosa	5	0.5	2	0.06395	positive
	Lomandra glauca	3	0.5	1	0.0407	positive
	Schoenus imberbis	2	0.5	3	0.001938	positive
	Xanthorrhoea minor subsp. minor	2	0.5	1	0.05233	positive
	Themeda australis	1	0.5	3	0.6221	negative
	Bursaria spinosa	0	0	3	0.5814	negative
	Cheilanthes sieberi subsp. sieberi	0	0	2	0.6085	negative
	Dichondra repens	0	0	3	0.5543	negative
	Entolasia stricta	0	0	3	0.5174	negative
	Lomandra multiflora subsp. multiflora	0	0	2	0.5097	negative
	Microlaena stipoides var. stipoides	0	0	3	0.7636	negative
	Cassytha glabella form glabella	2	0.5	2	0.1647	positive

37. Elderslie Banksia Scrub Forest

This community, listed as endangered under the *Threatened Species Conservation Act 1995*, was not sampled as part of this mapping project and a community description is therefore not available. Further information is available from NPWS (1997) "Native flora of western Sydney – Urban bushland biodiversity survey".

Riparian Communities

11. Alluvial Woodland

Sample Sites: (37) LIV62SCF, CAD04BTV, CAD11RIV, CAD13TPF, CAD22MKV, CAD23MKU, CAD25MKV, CAD26BTV, CAD27BTF, CAD28MKF, KUR06GYV, KUR12LUV, LIV03SCF, LIV29SCF, PEN09SCV, PEN10SCV, PEN16SCF, PEN18SCS, PEN19BTF, PEN21BTF, PEN26BTV, PEN28SCV, PRO04SCF, PRO05SCL, PRO09SCF, PRO10SCF, RIV15BPV, RIV19SCF, RIV20SCS, RIV31HAL, SPR18SCF, WAR16RIF, WAR25RIL, WAR26RIF, WIL03WLF, WIL07WLV, WIL10WLL

Examples on Public Land (tenure): Chain-o-Ponds Nature Reserve (NPWS); Cabramatta Creek Park (Council)

Area (ha 1750/1997): 36173/4729 **Proportion Extant:** 13.1%
No. Taxa (total/unique): 255/11 **No. Taxa per Plot ($\pm$sd):** 37.1 (11.4)

River Flat Forest contains a number of tree species which may dominate at different sites. However, no species in the upper tree stratum was recorded in more than 50% of the sample sites. The two most common species are *Eucalyptus amplifolia* and *E. tereticornis*, with *Angophora floribunda* occurring slightly less frequently. Map Unit 11 often includes a stratum of small trees, frequently including *Acacia parramattensis subsp. parramattensis*, and less frequently *Casuarina glauca*, and sometimes *Angophora floribunda* and *Melaleuca linariifolia*. A shrub stratum is usually evident, but is often sparse and invariably dominated by *Bursaria spinosa*. Map Unit 11 often has a dense ground cover dominated by grasses such as *Oplismenus aemulus, Microlaena stipoides var. stipoides, Entolasia marginata* and *Echinopogon ovatus.* Herb species are also common, including *Solanum prinophyllum, Pratia purpurascens* and *Commelina cyanea*.

Map Unit 11 occurs exclusively along, or in close proximity to minor watercourses draining soils derived from Wianamatta Shale. It is the most common community found on soils of recent alluvial deposition. Map Unit 11 is also found on the floodplains of the major watercourse, the Hawkesbury-Nepean River, but grades into Map Unit 12 (Riparian Forest) on the terraces immediately adjacent to the river.

Previous Floristic Classifications:
River Flat Forest as described by Benson (1992), (Map Unit 9f), is herein divided into three separate communities: Map Unit 11 (River Flat Forest), Map Unit 12 (Riparian Forest) and Map Unit 5 (Riparian Woodland). Map Units 11 and 12 correspond to the major groupings 'Cumberland Plain Creek Systems' and 'Hawkesbury-Nepean River and major Tributaries' defined by NPWS (1997). Map Unit 5 was included as a component of the riverine vegetation by both Benson (1992) and NPWS (1997). 'Forest Red Gum – Cabbage Gum Forest', 'Forest Red Gum – Blue Gum Forest' and 'Swamp Oak Forest' (*sensu* NPWS 1997) are included in Map Unit 11. The NSW Threatened Species Act (1995) lists 'Sydney Coastal River Flat Forest' as an endangered ecological community. Map Units 11 and 12 fall within the definition of this listed community. 'Camden White Gum Forest' as described by Benson (1992), (Map Unit 6d), is included within Map Unit 12.

Habitat:

Parent Geology: Holocene Alluvium (59%), Wianamatta Shale (22%), Mittagong Formation (8%), Hawkesbury Sandstone (8%), Tertiary Alluvium (3%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	78.6 (91.8)	2.2 (3.1)	811.2 (45.5)	6.6 (3.5)	28.3 (0.6)	215.5 (2.2)
Range	3 – 303	0 – 13.5	707 – 895	2 – 18	27.1 – 29.1	210 – 219

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	23.7 (5.5)	23.2 (11.7)
Small Tree	78	11.6 (4.2)	14.5 (8.5)
Shrub	92	3.7 (1.3)	12.9 (9.6)
Forb	95	0.5 (0.6)	60.9 (25.0)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Acacia parramattensis	3	0.8378	2	0.1788	Positive
	Casuarina cunninghamiana subsp. Cunninghamiana	4	0.05405	0	0	Positive
	Eucalyptus deanei	3	0.02703	0	0	Positive
Shrub	Bursaria spinosa	3	1	3	0.5468	Constant
Ground	Oplismenus aemulus	3	0.9459	2	0.1767	Positive
	Entolasia marginata	3	0.8919	2	0.2474	Positive
	Echinopogon ovatus	3	0.8378	2	0.3451	Positive
	Solanum prinophyllum	2	0.7027	2	0.2952	Positive
	Pratia purpurascens	2	0.6757	2	0.4262	Positive
	Commelina cyanea	3	0.5946	2	0.1268	Positive
	Desmodium varians	2	0.5676	2	0.4033	Positive
	Lomandra longifolia	2	0.5676	2	0.2661	Positive
	Oxalis perennans	3	0.5676	2	0.3451	Positive
	Brunoniella australis	3	0.5405	3	0.4096	Positive
	Alisma plantago-aquatica	1	0.05405	0	0	Positive
	Samolus valerandi	1	0.05405	0	0	Positive
	Bolboschoenus caldwellii	2	0.02703	0	0	Positive
	Centipeda cunninghamii	2	0.02703	0	0	Positive
	Cyperus trinervis	2	0.02703	0	0	Positive
	Fimbristylis velata	1	0.02703	0	0	Positive
	Myriophyllum variifolium	2	0.02703	0	0	Positive
	Persicaria subsessilis	2	0.02703	0	0	Positive
	Scutellaria mollis	2	0.02703	0	0	Positive
	Themeda australis	2	0.2162	3	0.6528	Negative
	Aristida vagans	1	0.08108	2	0.5177	negative
	Lomandra multiflora subsp. multiflora	1	0.08108	2	0.5405	negative
	Entolasia stricta	2	0.05405	3	0.5509	negative
	Dichondra repens	3	0.973	3	0.5198	constant
	Microlaena stipoides var. stipoides	4	0.973	3	0.7443	constant
	Cheilanthes sieberi subsp. sieberi	2	0.5135	2	0.6133	constant
	Glycine tabacina	3	0.5676	2	0.3139	positive

	Glycine clandestina	2	0.5405	2	0.4345	positive
Tree	Eucalyptus amplifolia	4	0.4595	4	0.02703	uninformative
	Eucalyptus tereticornis	2	0.4595	4	0.3015	uninformative
	Angophora floribunda	2	0.3243	2	0.07484	uninformative
	Casuarina glauca	4	0.3243	3	0.01663	uninformative
	Eucalyptus eugenioides	1	0.1892	2	0.1435	uninformative
	Angophora subvelutina	4	0.1351	4	0.02911	uninformative
	Eucalyptus moluccana	1	0.1351	4	0.2432	uninformative
	Eucalyptus globoidea	1	0.08108	2	0.06445	uninformative
	Eucalyptus punctata	1	0.08108	3	0.2703	uninformative
	Eucalyptus baueriana	5	0.05405	3	0.008316	uninformative
	Corymbia maculata	4	0.02703	4	0.05405	uninformative
	Eucalyptus elata	1	0.02703	4	0.006237	uninformative
	Eucalyptus piperita subsp. Piperita	1	0.02703	3	0.03534	uninformative
	Eucalyptus sclerophylla	1	0.02703	4	0.1123	uninformative

5. Riparian Woodland

Sample Sites: (2) LIV04SCV, PRO07SCD

Examples on Public Land (tenure): Nurragingy Reserve (Council)

Area (ha 1750/1997): not calculated
Proportion Extant: not calculated
No. Taxa (total/unique): 41/12
No. Taxa per Plot (±sd): 24.0 (1.4)

Map Unit 5 is a highly restricted community occurring within creeklines and adjacent swampy areas draining Wianamatta Shale soils. It is likely to be found in association with Map Unit 11 (Alluvial Woodland), but is distinct from this community in occupying the wettest areas along watercourses. Although poorly sampled in this study, Map Unit 5 is likely to have and Overstorey dominated by *Eucalyptus amplifolia* and *Casuarina glauca*. A shrub stratum is usually not present, but the ground stratum may be dense and include species such as *Alternathera denticulata*, *Carex appresa*, *Persicaria decipiens* and *Juncus usitatus*.

This map unit is not displayed on the western Sydney vegetation maps but is shown as Map Unit 11 (Alluvial Woodland).

Previous Floristic Classifications:
Riparian Woodland was included in a discussion on Riparian Habitats by NPWS (1997).

Habitat:
Parent Geology: Wianamatta Shale (50%), Holocene Alluvium (50%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	34.0 (5.7)	1.3 (0.5)	829.0 (0.0)	3.5 (0.7)	27.9 (0.4)	217.0 (0.0)
Range	30 - 38	0.9 – 1.7	829 – 929	3 - 4	27.6 – 28.2	217 –217

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	26.0 (8.5)	27.5 (31.8)
Small Tree	50	10 (-)	15 (-)
Rushes	50	2 (-)	5 (-)
Forb	100	0.5 (0.7)	57.5 (3.5)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Casuarina glauca	6	0.5	3	0.03682	positive
	Eucalyptus amplifolia	4	0.5	4	0.0562	positive
Shrub	Bursaria spinosa	1	0.5	3	0.5795	negative
Ground	Agrostis avenacea var. avenacea	3	1	1	0.1143	positive
	Alternanthera denticulata	4	1	1	0.02713	positive

Carex appressa	3	1	1	0.01357	positive
Cynodon dactylon	4	1	2	0.05814	positive
Damasonium minus	4	1	0	0	positive
Juncus usitatus	3	1	2	0.1298	positive
Persicaria decipiens	4	1	2	0.01163	positive
Azolla filiculoides var. rubra	2	0.5	0	0	positive
Centella asiatica	4	0.5	2	0.1337	positive
Centipeda minima var. minima	3	0.5	2	0.01744	positive
Commelina cyanea	2	0.5	2	0.1589	positive
Echinopogon ovatus	2	0.5	2	0.3798	positive
Eclipta platyglossa	2	0.5	2	0.01357	positive
Elatine gratioloides	4	0.5	0	0	positive
Eleocharis sphacelata	2	0.5	0	0	positive
Juncus planifolius	4	0.5	2	0.0155	positive
Lemna disperma	3	0.5	0	0	positive
Ludwigia peploides subsp. Montevidensis	3	0.5	1	0.001938	positive
Marsilea hirsuta	1	0.5	0	0	positive
Maundia triglochinoides	1	0.5	0	0	positive
Myriophyllum simulans	2	0.5	2	0.003876	positive
Paspalum distichum	3	0.5	4	0.001938	positive
Pratia purpurascens	3	0.5	2	0.4438	positive
Ranunculus inundatus	2	0.5	0	0	positive
Triglochin microtuberosum	1	0.5	0	0	positive
Triglochin striatum	5	0.5	0	0	positive
Typha orientalis	3	0.5	0	0	positive
Cheilanthes sieberi subsp. sieberi	0	0	2	0.6085	negative
Dichondra repens	0	0	3	0.5543	negative
Entolasia stricta	0	0	3	0.5174	negative
Lomandra multiflora subsp. multiflora	0	0	2	0.5097	negative
Themeda australis	0	0	3	0.624	negative
Microlaena stipoides var. stipoides	2	0.5	3	0.7616	constant
Glyceria australis	5	0.5	0	0	positive

12. Riparian Forest

Sample Sites: (9) CAD06TPU, CAD08TPS, CAD09TPU, CAD12TPF, CAD38TPV, LIV16BPS, LIV21BPS, LIV25SCS, WAR08RIM

Community Examples on Public Land (tenure): Bents Basin State Recreation Area (NPWS)

Area (ha 1750/1997): 2989/717 **Proportion Extant:** 24.0%
No. Taxa (total/unique): 112/5 **No. Taxa per Plot (±sd):** 28.7 (9.4)

Riparian Forest is like Map Unit 11 in having no particular tree species occurring frequently across all sample sites. *Eucalyptus botryoides, E. elata, Angophora subvelutina* and *A. floribunda* are species most likely to be found dominating at any particular site. A small tree stratum is usually present, and often contains species of *Acacia*, such as *A. binervia, A. floribunda* and *A. mearnsii*, although no particular species occurred consistently across the sample sites. Common species occurring in the ground stratum include *Oplismenus aemulus, Pteridium esculentum, Microlaena stipoides var. stipoides, Stipa ramosissima* and *Echinopogon ovatus*.

Map Unit 12 is not widely distributed and only occurred at sample sites on the banks of the Hawkesbury-Nepean River or on the terraces immediately adjacent to the river.

Previous Floristic Classifications:
Riparian Forest falls within Benson's (1992) 'River Flat Forest' (Map Unit 9f), but includes Map Unit 6d, 'Camden White Gum Forest'. This community falls within the definition of the endangered ecological community 'Sydney Coastal River Flat Forest' as defined under the NSW Threatened Species Act. The relationship between these communities is discussed in more detail in the description of Map Unit 11 (Alluvial Woodland). Riparian Forest broadly corresponds with NPWS' (1997) grouping 'Hawkesbury-Nepean River and Major Tributaries' and can be considered to include 'Blue Gum – River Peppermint – Blue Box Forest', 'Camden White Gum – River Peppermint Forest', Cabbage Gum – Broad-leaved Apple Forest', 'River-Oak Forest' and possibly 'Swamp Mahogany Forest'.

Habitat:
Parent Geology: Holocene Alluvium (100%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	43.1 (26.3)	3.5 (4.0)	769.2 (68.3)	5.9 (3.9)	28.0 (0.4)	215.1 (1.8)
Range	10 – 73	0 – 10.6	708 – 861	2 – 14	27.5 – 28.8	213 - 217

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	24.7 (5.9)	20.9 (11.5)
Small Tree	89	12.0 (3.3)	23.8 (15.5)
Shrub	100	4.0 (1.8)	14.6 (20.4)
Forb	100	1.0 (0.0)	46.3 (27.7)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus botryoides	5	0.3333	0	0	positive
	Eucalyptus benthamii	3	0.2222	0	0	positive
	Acacia mearnsii	4	0.1111	0	0	positive
Shrub	Hymenanthera dentata	3	0.6667	2	0.02358	positive
	Gonocarpus longifolius	3	0.2222	0	0	positive
	Croton verreauxii	1	0.1111	0	0	positive
	Bursaria spinosa	2	0.2222	3	0.5855	negative
Ground	Oplismenus aemulus	3	0.8889	2	0.22	positive
	Pteridium esculentum	3	0.7778	2	0.1218	positive
	Stipa ramosissima	3	0.7778	2	0.01965	positive
	Echinopogon ovatus	2	0.6667	2	0.3752	positive
	Lomandra longifolia	2	0.5556	2	0.2829	positive
	Poranthera microphylla	3	0.5556	2	0.3026	positive
	Pratia purpurascens	3	0.5556	2	0.442	positive
	Veronica plebeia	3	0.5556	2	0.2593	positive
	Wahlenbergia gracilis	2	0.5556	2	0.3811	positive
	Themeda australis	3	0.2222	3	0.6287	negative
	Cheilanthes sieberi subsp. sieberi	1	0.1111	2	0.6149	negative
	Lomandra multiflora subsp. Multiflora	1	0.1111	2	0.5147	negative
	Entolasia stricta	0	0	3	0.5246	negative
	Microlaena stipoides var. stipoides	4	1	3	0.7564	constant
	Dichondra repens	3	0.7778	3	0.5481	constant
	Glycine clandestina	2	0.5556	2	0.4401	positive
Tree	Angophora subvelutina	4	0.4444	4	0.02947	uninformative
	Eucalyptus elata	4	0.3333	1	0.001965	uninformative
	Angophora floribunda	1	0.2222	2	0.09037	uninformative
	Eucalyptus baueriana	3	0.1111	4	0.009823	uninformative
	Eucalyptus saligna X botryoides	5	0.1111	1	0.001965	uninformative
	Eucalyptus tereticornis	2	0.1111	4	0.3163	uninformative

Shale Communities

9. Shale Hills Woodland

Sample Sites: (61) CAD01LUM, CAD02LUM, CAD14PNU, CAD15PNU, CAD17PNM, CAD35BTF, CAD36LUU, CAD37LUM, CAM03BTU, CAM04BTV, CAM05BTL, CAM06BTV, CAM14BTL, CAM15BTL, CAM20BTM, CAM23BTV, CAM24BTC, CAM25BTL, CAM33BTL, CAM34LUL, CAM35BTL, CAM36BTL, LIV06LUM, LIV07LUL, **LIV28SCF**, LIV34BTF, **LIV37SCF**, LIV47BTS, LIV51LUM, LIV52BTC, PEN02LUU, PEN03LUU, PEN04LUM, PEN05LUL, PEN06LUV, PEN07LUM, PEN11BTU, PEN17BTM, **PEN20SCF**, PIC02BTF, PIC06PNM, PIC07PNU, PIC08PNM, PIC10LUM, PIC23PNL, PIC28PNU, PIC30TPM, PIC31MKF, PRO24BTL, PRO25BTM, PRO26BTM, PRO28BTU, PRO29LUU, PRO31BTU, WAR02LUM, WAR03LUV, WAR04BTV, WAR05LUF, WAR09LUL, WAR10LUU, WAR31LUL

Community Examples on Public Land (tenure): Mulgoa Nature Reserve (NPWS); Mount Annan Royal Botanic Gardens (RBG)

Area (ha 1750/1997): 38271/4309 **Proportion Extant:** 11.3%
No. Taxa (total/unique): 258/13 **No. Taxa per Plot ($\pm$sd):** 36.9 (7.2)

Map Unit 9 is dominated by *Eucalyptus moluccana* and *E. tereticornis* with *E. crebra* occurring less frequently. A small tree stratum is often present and most frequently includes *Acacia implexa* together with a variety of the commonly occurring *Eucalyptus* species. Map Unit 9 typically has a shrub stratum dominated by *Bursaria spinosa*, and more rarely includes other species such as *A. falcata*, *Breynia oblongifolia*, *Indigophera australis* and *Dodonea viscosa subsp. cuneata*. The ground stratum is variable in cover. Often there is a good cover of grass and herb species, but this become quite sparse under a dense shrub stratum of *B. spinosa* or the exotic species *Olea europea subsp. africana*. Species include *Dichondra repens, Brunoniella australis, Aristida ramosa, Desmodium varians, Microlaena stipoides var. stipoides, Themeda australis* and *Cheilanthes sieberi spp. sieberi*.

Shale Hills Woodland occurs almost exclusively on soils derived from Wianamatta Shale. Three sample sites (in bold text) were located on soils that were clearly alluvial in nature. This result is difficult to explain and no attempt was made to model the distribution of Map Unit 9 on this soil landscape. Map Unit 9 is closely related to Map Unit 10, Shale Plains Woodland. There is a reasonably clear differentiation between the habitats of the two communities. Map Unit 9 is widely distributed in, and largely confined to, the southern half of the study area, and occurs at higher elevations and on steeper slopes than Map Unit 10. Map Unit 9 most often occurs in undulating country with a relatively high degree of ruggedness and reaches its northern limit at Mulgoa Nature Reserve and Prospect Reservoir. Sample sites at these locations were sometimes difficult to distinguish from Map Unit 10. On very steep, sheltered hillsides Map Unit 9 grades into Map Unit 14, Moist Shale Woodland, although this Map Unit is highly restricted in distribution and poorly surveyed.

Previous Floristic Classifications:

Cumberland Plain Woodland as described by Benson 1992 (Map Units 9b?, 10c and 10d) and as listed under the NSW Threatened Species Act (1995), is herein divided into two separate communities: Map Unit 9 (Shale Hills Woodland) and Map Unit 10 (Shale Plains Woodland). Map Unit 9 includes areas previously recognised as Map Units 9b, 10c and 10d (Benson 1992), but most often corresponds with Map Unit 10d in the southern half of the study area. Although Benson (1992) ascribed vegetation in the north of the study area to Map Unit 10d these areas are included in Map Unit 10 in the present survey.

Habitat:

Parent Geology: Wianamatta Shale (92%), Holocene Alluvium (8%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January
Mean ($^{\pm}$sd)	111.5 (68.8)	6.1 (5.3)	811.6 (42.9)	12.1 (7.5)	27.8 (5.9)	214.1 (3.3)
Range	36 – 328	0 – 22.0	722 – 903	1 – 40	26.7 – 28.9	201 – 217

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($^{\pm}$sd)	Mean Foliage Cover (%)($^{\pm}$sd)
Tree	100	22.8 (6.1)	18.5 (9.4)
Small Tree	59	10.5 (4.2)	11.1 (11.4)
Shrub	95	3.8 (1.6)	19.6 (13.6)
Forb	100	0.5 (0.5)	43.9 (24.3)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus moluccana	4	0.7049	3	0.1729	positive
	Eucalyptus tereticornis	4	0.7049	3	0.2604	positive
	Acacia implexa	2	0.5738	1	0.1072	positive
Shrub	Rhaminus alaternus	1	0.01639	0	0	positive
	Bursaria spinosa	4	0.918	3	0.5339	constant
Ground	Dichondra repens	3	0.9672	3	0.4967	positive
	Brunoniella australis	3	0.8525	3	0.3611	positive
	Aristida ramosa	3	0.8361	2	0.1729	positive
	Desmodium varians	3	0.8197	2	0.3611	positive
	Carex inversa	2	0.623	2	0.07002	positive
	Asperula conferta	2	0.6066	2	0.06565	positive
	Dichelachne micrantha	2	0.6066	2	0.3414	positive
	Oxalis perennans	2	0.5246	2	0.3392	positive
	Capillipedium spicigerum	1	0.03279	0	0	positive
	Portulaca oleracea	1	0.03279	0	0	positive
	Alternanthera species A	1	0.01639	0	0	positive
	Chamaesyce dallachyana	1	0.01639	0	0	positive
	Chloris divaricata	1	0.01639	0	0	positive
	Cyperus fulvus	1	0.01639	0	0	positive
	Dactyloctenium radulans	1	0.01639	0	0	positive
	Danthonia racemosa var. obtusata	1	0.01639	0	0	positive
	Oxalis rubens	2	0.01639	0	0	positive
	Sisymbrium irio	1	0.01639	0	0	positive
	Veronica brownii	1	0.01639	0	0	positive
	Lomandra multiflora subsp. multiflora	2	0.2459	2	0.5427	negative
	Aristida vagans	2	0.2295	2	0.5208	negative
	Entolasia stricta	4	0.01639	3	0.5821	negative
	Microlaena stipoides var. stipoides	3	0.7869	3	0.7571	constant
	Themeda australis	4	0.7705	3	0.6018	constant
	Cheilanthes sieberi subsp. sieberi	2	0.6885	2	0.5952	constant
	Glycine tabacina	2	0.5574	2	0.302	positive
Tree	Eucalyptus crebra	4	0.3115	3	0.2035	uninformative
	Eucalyptus eugenioides	3	0.1311	2	0.1488	uninformative
	Eucalyptus amplifolia	4	0.04918	4	0.05908	uninformative

Angophora floribunda	3	0.03279	2	0.1007	uninformative
Corymbia maculata	5	0.03279	4	0.0547	uninformative
Angophora subvelutina	3	0.01639	4	0.03939	uninformative
Eucalyptus fibrosa	1	0.01639	4	0.2013	uninformative

10. Shale Plains Woodland

Sample Sites: (72) LIV59RIS, LIV60RIS, LIV61RIF, CAD03BTF, CAD05BTC, CAD10BTF, CAM10BTU, CAM11BTU, CAM12BTF, CAM17SCU, CAM18BTC, CAM19BTF, CAM30BTU, KUR05LUU, KUR13RIF, KUR14ABL, KUR15BPF, KUR17LUU, KUR18LUM, LIV01BTF, LIV02BTM, LIV05BTM, LIV08BTM, LIV09BTM, LIV11PNL, LIV35BTF, LIV36BTF, LIV38RIS, LIV41RIS, LIV49BTF, LIV50BTF, PEN08BTF, PEN12BTM, PEN13LUU, PEN24LUM, PEN25BTM, PEN27BTU, PEN29BTU, PEN30LUM, PRO01BTU, PRO02BTF, PRO03BTM, PRO06SCF, PRO08BTU, PRO11SCF, PRO12BTF, PRO13BTL, PRO14BTL, PRO15BTF, PRO16BTM, PRO17BTF, PRO22BTU, PRO23SCF, PRO27BTU, PRO30BTU, RIV12BPU, RIV21BTF, RIV24BTF, RIV25BTF, RIV26BTF, SPR14LUU, SPR19LUF, SPR20LUF, SPR21LUM, WAR01BTF, WIL12WLC, WIL14WLM, WIL15UPF, WIL16UPV, WIL17WLM, WIL20LHU, WIL21LHV

Examples on Public Land (tenure): Scheyville National Park (NPWS); The Crest Reserve (Council); Noorumba Nature Reserve (Council)

Area (ha 1750/1997): 87172/6745 **Proportion Extant:** 7.7%
No. Taxa (total/unique): 277/10 **No. Taxa per Plot ($\pm$sd):** 43.8 (9.4)

Shale Plains Woodland is dominated by *Eucalyptus moluccana* and *E. tereticornis* with *E. crebra, E. eugenioides* and *Corymbia maculata* occurring less frequently. These species often form a separate small tree stratum, occasionally including other species such as *Exocarpus cupressiformis, Acacia parramattensis subsp. parramattensis* and *Acacia decurrens*. A shrub stratum is usually present and dominated by *Bursaria spinosa*. Common ground stratum species include *Dichondra repens, Aristida vagans, Microlaena stipoides var stipoides, Themeda australis, Brunoniella australis, Desmodium varians, Opercularia diphylla, Wahlenbergia gracilis* and *Dichelachne micrantha*.

Shale Plains Woodland is the most widely distributed community on the Cumberland Plain. It predominantly occurs on soils derived from Wianamatta Shale, but also occurs on holocene alluvium in well drained areas that are infrequently inundated. Isolated patches of Map Unit 10 may be found on soils derived from the Mittagong Formation, but only in the vicinity of outcrops of almost pure shale. Very rarely, it may occur on soils derived from Tertiary Alluvium, but it is more usual for Map Unit 10 to grade into Map Unit 103 (Shale Gravel Transition Forest) near the boundary of Shale and Tertiary Alluvium. Towards the edge of the Cumberland Plain, Map Unit 10 grades into Map Unit 1(Shale Sandstone Transition Forest, Low Sandstone Influence) as the depth of the shale soils decreases and the influence of the underlying sandstone increases. In the southern half of the study area Map Unit 10 grades into Map Unit 9 (Shale Hills Woodland) with increasing elevation and ruggedness. This gradation commences on the gentle rises running south from Prospect Reservoir in the centre of the plain, and south of Mulgoa Nature Reserve on the western boundary of the plain.

Previous Floristic Classifications:
Cumberland Plain Woodland as described by Benson (1992) (Map Units 9b?, 10c and 10d) and as listed under the NSW Threatened Species Act (1995), is herein divided into two separate communities: Map Unit 9 (Shale Hills Woodland) and Map Unit 10 (Shale Plains Woodland). Map Unit 10 includes areas previously recognised as Map Units 9b, 10c and 10d (Benson 1992), but most often corresponds with Map Unit 10c. Although Benson (1992) ascribed vegetation in the north of the study area to Map Unit 10d these areas are included in Map Unit 10 in the present survey.

Habitat:

Parent Geology: Wianamatta Shale (68%), Holocene Alluvium (21%), Mittagong Formation (4%), Tertiary Alluvium (3%), Hawkesbury Sandstone (3%), Aeolian Deposits (1%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January
Mean ($^{\pm}$sd)	55.1 (34.0)	2.1 (2.5)	829.0 (38.8)	6.2 (3.5)	28.1 (0.6)	216.5 (2.0)
Range	1 – 167	0 – 17.4	739 – 923	1 – 22	27.0 – 29.1	203 – 219

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($^{\pm}$sd)	Mean Foliage Cover (%)($^{\pm}$sd)
Tree	100	20.8 (5.1)	17.2 (9.3)
Small Tree	57	9.8 (3.5)	9.5 (7.3)
Shrub	100	3.1 (1.3)	14.0 (9.6)
Forb	99	0.5 (0.5)	45.1 (19.2)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus moluccana	3	0.6528	4	0.1682	positive
	Eucalyptus tereticornis	4	0.6389	3	0.2601	positive
	Bursaria spinosa	4	0.9722	3	0.5157	constant
Ground	Dichondra repens	3	0.9722	3	0.4843	positive
	Aristida vagans	3	0.9167	2	0.417	positive
	Brunoniella australis	3	0.875	3	0.3453	positive
	Desmodium varians	3	0.8611	2	0.343	positive
	Opercularia diphylla	2	0.8056	2	0.3587	positive
	Wahlenbergia gracilis	2	0.7917	2	0.3184	positive
	Dichelachne micrantha	3	0.75	2	0.3117	positive
	Paspalidium distans	3	0.75	2	0.2444	positive
	Eragrostis leptostachya	2	0.6944	2	0.2152	positive
	Lomandra filiformis subsp. Filiformis	3	0.6111	2	0.2713	positive
	Dianella longifolia	2	0.5972	1	0.1749	positive
	Oxalis perennans	3	0.5972	2	0.3229	positive
	Lomandra multiflora subsp. Multiflora	2	0.5694	2	0.4978	positive
	Gnaphalium sphaericum	2	0.5556	1	0.1816	positive
	Goodenia hederacea subsp. Hederacea	2	0.5556	2	0.3229	positive
	Aristida ramosa	2	0.5417	2	0.204	positive
	Arthropodium milleflorum	2	0.5417	2	0.204	positive
	Danthonia tenuior	2	0.5139	2	0.157	positive
	Cymbopogon refractus	2	0.5	2	0.148	positive
	Echinopogon caespitosus var. caespitosus	2	0.5	2	0.2668	positive
	Dichopogon strictus	1	0.04167	0	0	positive
	Ranunculus lappaceus	3	0.02778	0	0	positive
	Brachycome multifida	4	0.01389	0	0	positive
	Calandrinia pickeringii	1	0.01389	0	0	positive
	Danthonia setacea	2	0.01389	0	0	positive
	Pimelea curviflora var. subglabrata	2	0.01389	0	0	positive
	Rorippa laciniata	2	0.01389	0	0	positive
	Wurmbea biglandulosa	1	0.01389	0	0	positive

	Dipodium punctatum	1	0.01389	0	0	positive
	Entolasia stricta	2	0.1806	3	0.5695	negative
	Cheilanthes sieberi subsp. Sieberi	3	0.9444	2	0.5516	constant
	Microlaena stipoides var. stipoides	4	0.9028	3	0.7377	constant
	Themeda australis	4	0.875	3	0.5807	constant
	Glycine tabacina	3	0.6528	2	0.2803	positive
	Glycine clandestina	3	0.5556	2	0.4238	positive
Tree	Eucalyptus crebra	4	0.3056	4	0.2018	uninformative
	Eucalyptus eugenioides	2	0.2361	2	0.1323	uninformative
	Eucalyptus fibrosa	2	0.1667	4	0.1816	uninformative
	Angophora floribunda	1	0.06944	2	0.09641	uninformative
	Angophora subvelutina	4	0.06944	4	0.03139	uninformative
	Corymbia maculata	4	0.06944	4	0.04933	uninformative
	Eucalyptus amplifolia	4	0.06944	4	0.05605	uninformative
	Eucalyptus punctata	3	0.02778	3	0.2937	uninformative
	Eucalyptus baueriana	1	0.01389	4	0.01121	uninformative
	Eucalyptus globoidea	1	0.01389	2	0.07399	Uninformative
	Eucalyptus longifolia	1	0.01389	1	0.0157	Uninformative
	Eucalyptus paniculata	1	0.01389	4	0.01345	Uninformative

13. Western Sydney Dry Rainforest

Sample Sites: (9) CAD19PNM, CAD20PNM, CAD34PNL, PIC09BTU, PIC22PNV, PIC29PNM, PRO18PNM, WAR22LUL, WIL04WLM

Community Examples on Public Land (tenure): Fairfield City Farm (Council)

Area (ha 1750/1997): 1282/338 **Proportion Extant:** 26.4%
No. Taxa (total/unique): 149/18 **No. Taxa per Plot ($\pm$sd):** 44.7 (9.5)

No particular species of *Eucalyptus* characteristically occurs in Map Unit 13, although *Corymbia maculata* was recorded in the overstorey at three sample sites. The tree and small tree strata are composed of a mixture of species including *Melaleuca stypheliodes, Acacia implexa, Alectryon subcinereus* and less frequently *Streblus brunonianus*. Mesic species are predominant in the shrub stratum, such as *Pittosporum revolutum, Breynia oblongifolia, Clerodendrum tomentosum, Notelea longifolia f. longifolia* and *Sigesbeckia orientalis subsp. orientalis*. The ground stratum consists primarily of a mixture of fern and herb species, with relatively few grass species present. Frequently recorded species include *Adiantum aethiopicum, Pellaea falcata var. falcata, Asplenium flabellifolium, Dicondra repens, Microlaena stipoides var. stipoides, Oplismenus imbecillis, Plectranthus parvifolius, Desmodium varians, Galium propinquum* and *Stellaria flaccida*. Vine species are also common, including *Cayratia clematidea, Eustephus latifolius, Geitonoplesium cymosum, Pandorea pandorana, Aphanopetalum resinosum* and *Stephania japonica var. discolor*.

Map Unit 13 is highly restricted in distribution. It occurs almost exclusively on soils derived from Wianamatta Shale and generally occupies sheltered lower slopes and gullies on steeply sloping, rugged topography. It is often found at higher elevations in areas receiving higher rainfall than Map Units 9 (Shale Hills Woodland) and 10 (Shale Plains Woodland). The transition from Map Unit 13 to Map Units 9 or 10 is often abrupt, and is likely to relate primarily to moisture availability, but also fire history. Map Unit 13 is likely to have been more widely distributed in areas receiving higher rainfall than in flatter drier country where it was probably restricted to sheltered gullies. Gullies would also have provided protection from fire. This is potentially important as Map Unit 13 includes species unlikely to be resilient to fire. Sites occurring on Mittagong Formation soils are likely to be influenced by the sandstone and may have a different floristic composition.

Previous Floristic Classifications:
Western Sydney Dry Rainforest is equivalent to Benson's (1994) Map Unit 8d: 'Rainforest; (iv) Vine Thicket Rainforest', and NPWS' (1997) 'Dry Rainforest (1.1)'. NPWS' (1997) noted that this community was a variant of Floyd's (1990) Alliance VI, Suballiance 23 (*Ficus* spp.-*Streblus-Dendrocide-Cassine*). Western Sydney Dry Rainforest is listed as an endangered ecological community on the TSC Act (1995).

Habitat:
Parent Geology: Wianamatta Shale (89%), Mittagong Formation (11%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January
Mean ($^{+}$sd)	200.8 (81.9)	15.9 (6.4)	868 (41.2)	21.6 (7.5)	27.4 (0.6)	206.2 (6.4)
Range	10 – 275	8.5 – 29.6	809 – 918	7 – 34	26.6 – 28.6	196 – 215

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($^{+}$sd)	Mean Foliage Cover (%)($^{+}$sd)
Tree	100	20.9 (10.3)	35.1 (22.3)
Small Tree	67	10.3 (4.9)	22.5 (14.7)
Shrub	78	3.3 (1.0)	26.4 (19.7)
Forb	67	0.2 (0.4)	45.0 (25.9)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Melaleuca styphelioides	4	0.7778	3	0.0275	Positive
	Acacia implexa	2	0.6667	2	0.1532	Positive
	Alectryon subcinereus	2	0.6667	1	0.003929	Positive
	Streblus brunonianus	3	0.3333	0	0	Positive
	Diospyros australis	2	0.2222	0	0	Positive
	Acacia elata	1	0.1111	0	0	Positive
	Acacia maidenii	1	0.1111	0	0	Positive
	Acacia penninervis	2	0.1111	0	0	Positive
	Ehretia acuminata	1	0.1111	0	0	Positive
Shrub	Pittosporum revolutum	2	0.8889	2	0.05894	Positive
	Breynia oblongifolia	2	0.7778	2	0.1965	Positive
	Clerodendrum tomentosum	2	0.7778	1	0.07073	Positive
	Notelaea longifolia f. longifolia	2	0.7778	1	0.1729	Positive
	Sigesbeckia orientalis subsp. orientalis	2	0.7778	2	0.09823	Positive
	Hymenanthera dentata	2	0.5556	3	0.02554	Positive
	Rapanea variabilis	2	0.5556	2	0.07269	Positive
	Abutilon oxycarpum	2	0.3333	0	0	Positive
	Citriobatus pauciflorus	4	0.2222	0	0	Positive
	Notelaea venosa	2	0.2222	0	0	Positive
	Claoxylon australe	1	0.1111	0	0	Positive
	Omalanthus stillingiifolius	2	0.1111	0	0	Positive
	Psychotria loniceroides	2	0.1111	0	0	Positive
	Solanum brownii	1	0.1111	0	0	Positive
	Bursaria spinosa	2	0.2222	3	0.5855	Negative
Ground	Adiantum aethiopicum	3	1	3	0.1061	Positive
	Oplismenus imbecillis	3	0.8889	2	0.07269	Positive
	Pellaea falcata var. falcata	3	0.8889	2	0.02947	Positive
	Plectranthus parviflorus	2	0.7778	2	0.09823	Positive
	Pseuderanthemum variabile	2	0.6667	2	0.07073	Positive
	Asplenium flabellifolium	2	0.5556	2	0.02358	Positive
	Desmodium varians	2	0.5556	2	0.4126	Positive
	Galium propinquum	2	0.5556	2	0.1218	Positive
	Stellaria flaccida	3	0.5556	2	0.01965	Positive
	Pyrrosia rupestris	2	0.3333	0	0	Positive
	Senecio linearifolius	1	0.2222	0	0	Positive

	Cheilanthes sieberi subsp. sieberi	2	0.1111	2	0.6149	Negative
	Entolasia stricta	2	0.1111	3	0.5226	Negative
	Lomandra multiflora subsp. multiflora	0	0	2	0.5167	Negative
	Themeda australis	0	0	3	0.6326	Negative
	Dichondra repens	3	0.7778	3	0.5481	Constant
	Microlaena stipoides var. stipoides	2	0.7778	3	0.7603	Constant
	Cayratia clematidea	3	1	2	0.0668	Positive
	Eustrephus latifolius	2	0.8889	2	0.04519	Positive
	Geitonoplesium cymosum	2	0.8889	1	0.04322	Positive
	Pandorea pandorana	3	0.8889	2	0.0943	Positive
	Aphanopetalum resinosum	3	0.6667	1	0.005894	Positive
	Stephania japonica var. discolor	2	0.5556	2	0.0275	Positive
	Ripogonum album	1	0.2222	0	0	Positive
	Cynanchum elegans	3	0.1111	0	0	Positive
	Sicyos australis	1	0.1111	0	0	Positive
Tree	Corymbia maculata	3	0.3333	4	0.04715	Uninformative
	Eucalyptus tereticornis	4	0.2222	4	0.3143	Uninformative
	Eucalyptus pilularis	4	0.1111	4	0.11	Uninformative
	Syncarpia glomulifera	1	0.1111	3	0.1179	Uninformative

14. Moist Shale Woodland

Sample Sites: (9) CAD16PNC, CAD21PNU, CAD32BTM, LIV10PNU, PEN01LUM, PIC11PNU, PIC12PNC, PIC13PNU, PIC14PNM

Examples on Public Land (tenure): Mulgoa Nature Reserve (NPWS); Western Sydney Regional Park (NPWS)

Area (ha 1750/1997): 2034/604 **Proportion Extant:** 29.7%
No. Taxa (total/unique): 117/4 **No. Taxa per Plot (±sd):** 36.3 (8.1)

Moist Shale Woodland is dominated by *Eucalyptus tereticornis* and *E. moluccana*, with *E. crebra* and *Corymbia maculata* occurring more occasionally. A small tree stratum consisting of the same species is often evident, and this may occasionally include species such as *Acacia implexa* or *Acacia parramattensis subsp. parramattensis*. A relatively sparse shrub stratum is usually present and dominated by mesophyllic species. *Breynia oblongifolia, Clerodendrum tomentosum, Sigesbeckia orientalis subsp. orientalis, Bursaria spinosa and Olearia viscidula* are commonly occurring shrub species. The ground stratum is variable in cover and contains species such as *Desmodium varians, Cyperus gracilis, Galium propinquum, Cayratia clematidea, Glycine clandestina, Brunoniella australis, Desmodium brachypodum, Dichondra repens, Microlaena stipoides var stipoides* and *Solanum prinophyllum*.

Moist Shale Woodland, listed as endangered under the *Threatened Species Conservation Act 1995*, occurs exclusively on soils derived from Wianamatta shale and is restricted to rugged areas at higher elevations in the southern half of the study area. This community appears to represent the endpoint of the gradient in increasing elevation, rainfall and ruggedness from the central Cumberland Plain to the Razorback range at Picton. This gradient is parallelled by a transition from Map Unit 10 (Shale Plains Woodland) through Map Unit 9 (Shale Hills Woodland), with Map Unit 14 occurring on the upper portion of very steep sheltered slopes. Map Unit 14 is found in very similar environments to Map Unit 13 (Dry Rainforest), a community which is also a logical endpoint for a gradient in rainfall. Since both communities are highly restricted, and were sampled at relatively few sites it is difficult to determine what factors are responsible for their relative distributions. Map Unit 14 tends to occupy upper slopes while Map Unit 13 is often found on lower slopes and in gullies, which presumably provide a more reliably moist environment for the constituent rainforest species. It is also possible that Map Unit 14 represents a stage in the recovery of Map Unit 13 from fire.

Previous Floristic Classifications:
None known.

Habitat:
Parent Geology: Wianamatta Shale (100%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	221.8 (85.5)	12.4 (8.3)	862.2 (33.6)	27.9 (10.2)	27.3 (0.7)	207.4 (7.0)
Range	61 – 304	3.3 – 24.9	803 – 899	13 - 39	26.5 – 28.8	193 – 215

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	24.7 (4.6)	18.9 (7.8)
Small Tree	89	10.8 (4.7)	18.1 (15.3)
Shrub	78	3.3 (1.0)	15.1 (15.1)
Forb	100	0.3 (0.5)	30.3 (25.0)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus tereticornis	4	0.6667	4	0.3065	positive
	Eucalyptus moluccana	2	0.5556	4	0.2299	positive
Shrub	Breynia oblongifolia	2	0.7778	2	0.1965	positive
	Clerodendrum tomentosum	2	0.6667	1	0.07269	positive
	Sigesbeckia orientalis subsp. orientalis	3	0.6667	2	0.1002	positive
	Olearia viscidula	2	0.5556	1	0.0334	positive
	Bursaria spinosa	2	0.6667	3	0.5776	constant
Ground	Desmodium varians	2	1	2	0.4047	positive
	Cyperus gracilis	2	0.7778	2	0.1238	positive
	Galium propinquum	2	0.7778	2	0.1179	positive
	Brunoniella australis	3	0.6667	3	0.4145	positive
	Desmodium brachypodum	2	0.6667	1	0.1218	positive
	Solanum prinophyllum	2	0.6667	2	0.3183	positive
	Arthropodium milleflorum	2	0.5556	2	0.2456	positive
	Echinopogon ovatus	2	0.5556	2	0.3772	positive
	Einadia hastata	2	0.5556	2	0.1277	positive
	Nyssanthes diffusa	2	0.5556	2	0.001965	positive
	Oxalis perennans	2	0.5556	2	0.3576	positive
	Plectranthus parviflorus	2	0.5556	2	0.1022	positive
	Rumex brownii	2	0.5556	1	0.04519	positive
	Wahlenbergia gracilis	2	0.5556	2	0.3811	positive
	Acaena novae-zelandiae	1	0.1111	0	0	positive
	Chenopodium carinatum	1	0.1111	0	0	positive
	Cynoglossum australe	2	0.1111	0	0	positive
	Leptochloa decipiens	3	0.1111	0	0	positive
	Cheilanthes sieberi subsp. Sieberi	0	0	2	0.6169	negative
	Entolasia stricta	0	0	3	0.5246	negative
	Lomandra multiflora subsp. Multiflora	0	0	2	0.5167	negative
	Themeda australis	0	0	3	0.6326	negative
	Dichondra repens	3	1	3	0.5442	constant
	Microlaena stipoides var. stipoides	2	0.6667	3	0.7623	constant
	Cayratia clematidea	2	0.7778	2	0.07073	positive
	Glycine clandestina	3	0.7778	2	0.4361	positive
Tree	Eucalyptus crebra	5	0.3333	4	0.2141	uninformative
	Corymbia maculata	4	0.2222	4	0.04912	uninformative

15. Turpentine Ironbark Forest

Sample Sites: (6) HOR06LHM, LIV39RIS, PAR03BTL, PAR05GNL, PAR08GNL, PAR11WPM

Community Examples on Public Land (tenure): Darvall Park (Council); Fagan Park (Council)

Area (ha 1750/1997): 14574/236 **Proportion Extant:** 1.6
No. Taxa (total/unique): 130/6 **No. Taxa per Plot (±sd):** 45.3 (7.3)

Turpentine Ironbark Forest is dominated by *Syncarpia glomulifera* with *E. paniculata* and *E. eugeniodes* occurring less frequently. In areas of higher rainfall (1050 – 1080 mm *per annum*), *E. saligna* is dominant. *Eucalyptus punctata* occurs occasionally in areas where the shale soils are relatively shallow. A stratum of small trees is usually present and is composed of a mixture of species including *Syncarpia glomulifera, Pittosporum undulatum, Trema aspera* and *Acacia parramattensis subsp parramattensis*. The shrub stratum is usually sparse, and contains predominantly mesic species such as *Pittosporum revolutum, Breynia oblongifolia, Maytenus sylvestris, Polyscius sambucifolia subsp. A, Notelaea longifolia f. longifolia* and *Ozothamnus diosmifolius*. The ground stratum consists of a dense mixture of herb and grass species dominated by *Oplismenus aemulus, Pseuderanthemum variabile* and *Echinopogon ovatus*. Other frequently recorded species include *Entolasia marginata, Pratia purpurascens, Dianella longifolia, Arthropdium milleflorum* and *Rubus parvifolia*.

Turpentine Ironbark Forest occurs on soils derived from Wianamatta Shale and is restricted to the eastern edge of the Cumberland Plain where the average annual rainfall exceeds approximately 950 mm. Ascending to the Hornsby Plateau, Turpentine Ironbark Forest grades into Blue Gum High Forest as rainfall exceeds 1050 mm. This transition occurs at an altitude of approximately 100 m above sea level, although Turpentine Ironbark Forest is found at altitudes of up to 200 m on the Western edge of the Hornsby Plateau where rainfall falls below 1050 mm. Close to the shale/sandstone boundary, the community grades into Map Unit 43 (Turpentine Ironbark Margin Forest).

Turpentine Ironbark Forest has been almost entirely cleared and has been listed as an endangered ecological community ‘Sydney Turpentine Ironbark Forest’ under the NSW Threatened Species Act (1995). In the present survey both Map Units 15 and 43 are considered to fall within the definition of Sydney Turpentine Ironbark Forest. Scattered remnants are located between Bankstown and Eastwood. A major remnant located at the former Newington armaments depot at Homebush Bay does falls under this classification of Map Unit 43 (and is thus still considered to meet the definition of Sydney Turpentine Ironbark Forest under the NSW TSC Act (1995)). Remnants at Denistone Park and Darval Park (Eastwood), and Mobbs Hill (Carlingford) are at the upper limit of the rainfall range for this community. These remnants have previously been described as Blue Gum High Forest (Benson and Howell 1994, NPWS 1997), but despite the dominance of *E. saligna* are floristically more similar to vegetation of the lower rainfall zone.

Habitat:

Parent Geology: Wianamatta Shale (67%), Holocene Alluvium (17%), Mittagong Formation (17%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January
Mean ($^{\pm}$sd)	69.8 (60.9)	3.9 (4.6)	1018.0 (68.7)	12.8 (7.4)	26.9 (0.1)	216.7 (2.9)
Range	9 – 184	0.4 – (12.8)	886 - 1080	4 – 21	26.8 - 27.0	211 – 219

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($^{\pm}$sd)	Mean Foliage Cover (%)($^{\pm}$sd)
Tree	100	23.3 (6.8)	35.8 (19.6)
Small Tree	83	9.6 (1.7)	29.4 (18.1)
Shrub	83	2.6 (0.9)	14.4 (20.1)
Forb	100	0.7 (0.5)	70.8 (31.1)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Syncarpia glomulifera	4	1	3	0.1074	positive
	Acacia parramattensis	2	0.8333	2	0.2188	positive
	Pittosporum undulatum	4	0.6667	2	0.06836	positive
	Eucalyptus saligna	4	0.5	4	0.009766	positive
Shrub	Pittosporum revolutum	2	1	2	0.0625	positive
	Polyscias sambucifolia subsp. A	3	0.8333	1	0.06641	positive
	Breynia oblongifolia	3	0.6667	2	0.2012	positive
	Maytenus silvestris	2	0.6667	2	0.0332	positive
	Notelaea longifolia f. longifolia	2	0.6667	1	0.1777	positive
	Ozothamnus diosmifolius	2	0.6667	2	0.2715	positive
	Trema aspera	3	0.6667	1	0.0293	positive
	Rapanea variabilis	2	0.5	2	0.07617	positive
	Sigesbeckia orientalis subsp. orientalis	2	0.5	2	0.1055	positive
	Notelaea ovata	2	0.1667	0	0	positive
	Solanum aviculare	1	0.1667	0	0	positive
	Bursaria spinosa	2	0.3333	3	0.582	negative
Ground	Echinopogon ovatus	3	1	2	0.373	positive
	Oplismenus aemulus	4	1	3	0.2227	positive
	Pseuderanthemum variabile	4	1	2	0.07031	positive
	Pratia purpurascens	2	0.8333	2	0.4395	positive
	Dianella longifolia	2	0.6667	2	0.2285	positive
	Entolasia marginata	4	0.6667	2	0.2891	positive
	Arthropodium milleflorum	2	0.5	2	0.248	positive
	Rubus parvifolius	2	0.5	2	0.07227	positive
	Chiloglottis formicifera	3	0.1667	0	0	positive
	Gahnia melanocarpa	1	0.1667	0	0	positive
	Entolasia stricta	1	0.5	3	0.5156	negative
	Themeda australis	1	0.3333	3	0.625	negative
	Cheilanthes sieberi subsp. sieberi	0	0	2	0.6133	negative
	Lomandra multiflora subsp. multiflora	0	0	2	0.5137	negative
	Microlaena stipoides var. stipoides	4	1	3	0.7578	constant

	Dichondra repens	3	0.8333	3	0.5488	constant
	Eustrephus latifolius	2	0.8333	2	0.05078	positive
	Pandorea pandorana	2	0.8333	2	0.09961	positive
	Glycine tabacina	2	0.6667	2	0.3281	positive
	Cayratia clematidea	3	0.5	2	0.07812	positive
	Clematis glycinoides var. glycinoides	2	0.5	2	0.1387	positive
	Glycine microphylla	2	0.5	2	0.207	positive
	Calystegia marginata	3	0.1667	0	0	positive
	Hibbertia dentata	3	0.1667	0	0	positive
Tree	Eucalyptus eugenioides	4	0.3333	2	0.1445	uninformative
	Eucalyptus paniculata	5	0.3333	1	0.009766	uninformative
	Eucalyptus punctata	1	0.3333	3	0.2559	uninformative
	Angophora costata	1	0.1667	3	0.125	uninformative
	Angophora floribunda	5	0.1667	2	0.0918	uninformative
	Eucalyptus moluccana	1	0.1667	4	0.2363	uninformative
	Eucalyptus tereticornis	1	0.1667	4	0.3145	uninformative

43. Turpentine Ironbark Margin Forest

Sample Sites: (11) KUR01LHU, KUR03HAU, KUR04LUM, KUR07LHM, KUR08LUU, KUR09LUM, POR01BTC, HOR05GNU, PAR04GNM, PAR06BTM, PAR07BTU, PAR09GNM

Examples on Public Land (tenure): Wallumatta Nature Reserve (NPWS); Menai Park (Council)

Area (ha 1750/1997): 11942/946 **Proportion Extant:** 7.9%
No. Taxa (total/unique): 261/3 **No. Taxa per Plot ($\pm$sd):** 51.0 (6.7)

Turpentine Ironbark Margin Forest is dominated by *Eucalyptus punctata* and *Syncarpia glomulifera* with a sparse stratum of small trees including *Acacia parramattensis* and *Pittosporum undulatum*. A variety of tree species occur more sporadically, including *Corymbia gummifera* and *E. globoidea*. The shrub stratum is usually relatively sparse and features mesic species such as *Polyscias sambucifolia* subsp. A, *Breynia oblongifolia* and *Notelaea longifolia f. longifolia*, as well as some sclerophyllous species such as *Leucopogon juniperinus*. The ground stratum is frequently dense and dominated by a range of grass species including *Entolasia marginata, E. stricta, Panicum simile, Themeda australis, Microlaena stipoides* var. *stipoides, Echinopogon caespitosus* var. *caespitosus* and *Oplismenus aemulus*. A variety of herb species are also represented. Frequently recorded species include *Pratia purpurascens, Gonocarpus tetragynus, Dianella caerulea, Dichondra repens* and *Pseuderanthemum variabile*.

Map Unit 43 occurs in higher rainfall areas on the margins of the Cumberland Plain in close proximity to the sandstone/shale boundary and adjoining Map Unit 15 (Turpentine Ironbark Forest). Sample sites representative of this Map Unit were located on the southwestern edge of the Hornsby Plateau, the northern end of the Woronora Plateau and west of Kurrajong. The majority of sample sites were located within approximately 600 m of the shale/sandstone boundary. Soils typically had a relatively high level of sandstone influence. Areas with a lower level of sandstone influence have been extensively cleared and were not sampled in this survey. As the level of sandstone influence in the soil decreases, Map Unit 43 grades into Map Unit 152 (Blue Gum High Forest) in areas where the annual rainfall exceeds 1050 mm. In areas with lower rainfall Map Unit 43 grades into Map Unit 15 (Turpentine Ironbark Forest).

Previous Floristic Classifications:
Turpentine Ironbark Margin Forest is one of two communities which together correspond to Sydney Turpentine Ironbark Forest as listed on Schedule 2 of the NSW Threatened Species Act (1995).

Parent Geology: Wianamatta Shale (75%), Mittagong Formation (17%), Hawkesbury Sandstone (8%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January	Distance to Sandstone (m)
Mean ($\pm$sd)	116.8 (101.8)	7.6 (5.8)	1009.3(113.9)	15.2 (13.5)	27.6 (1.1)	213.1 (4.9)	265.6 (296.9)
Range	2 – 308	0 – 18.0	825 – 1155	2 – 43	26.0 – 29.1	205 – 219	0 – 843.4

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	21.8 (5.0)	24.2 (10.8)
Small Tree	100	10.3 (3.6)	7.2 (4.7)
Shrub	100	2.6 (1.6)	11.0 (9.7)
Forb	100	0.8 (0.6)	51.3 (23.7)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Syncarpia glomulifera	3	0.7273	3	0.1045	Positive
	Acacia parramattensis	3	0.6364	2	0.217	Positive
	Eucalyptus punctata	3	0.5455	3	0.2505	Positive
	Pittosporum undulatum	2	0.5455	2	0.06509	Positive
Shrub	Notelaea longifolia f. longifolia	2	0.9091	1	0.1677	Positive
	Polyscias sambucifolia subsp. A	3	0.8182	1	0.05917	Positive
	Leucopogon juniperinus	3	0.7273	2	0.1795	Positive
	Ozothamnus diosmifolius	3	0.7273	2	0.2663	Positive
	Breynia oblongifolia	2	0.6364	2	0.1972	Positive
	Astrotricha floccosa	2	0.1818	0	0	Positive
	Lissanthe sapida	2	0.1818	0	0	Positive
	Callistemon shiressii	1	0.09091	0	0	Positive
	Bursaria spinosa	2	0.5455	3	0.5799	Constant
Ground	Pratia purpurascens	3	0.9091	2	0.4339	Positive
	Entolasia marginata	3	0.7273	2	0.284	Positive
	Gonocarpus tetragynus	2	0.7273	2	0.1992	Positive
	Lomandra longifolia	2	0.7273	2	0.2781	Positive
	Panicum simile	2	0.7273	2	0.3294	Positive
	Aristida vagans	3	0.6364	2	0.4832	Positive
	Dianella caerulea	2	0.6364	2	0.2051	Positive
	Echinopogon caespitosus var. caespitosus	2	0.6364	2	0.2919	Positive
	Lepidosperma laterale	3	0.6364	2	0.4162	Positive
	Gahnia aspera	3	0.5455	2	0.06903	Positive
	Oplismenus aemulus	2	0.5455	3	0.2249	Positive
	Pseuderanthemum variabile	2	0.5455	2	0.07101	Positive
	Entolasia stricta	3	0.8182	3	0.5089	Constant
	Dichondra repens	3	0.6364	3	0.5503	Constant
	Microlaena stipoides var. stipoides	3	0.6364	3	0.7633	Constant
	Themeda australis	3	0.6364	3	0.6213	Constant
	Cheilanthes sieberi subsp. sieberi	3	0.5455	2	0.6075	Constant
	Lomandra multiflora subsp. multiflora	2	0.5455	2	0.5069	Constant
	Billardiera scandens	3	0.9091	1	0.3136	Positive
	Glycine clandestina	2	0.7273	2	0.4359	Positive
Tree	Corymbia gummifera	1	0.4545	2	0.217	Uninformative
	Eucalyptus globoidea	3	0.4545	2	0.0572	Uninformative
	Eucalyptus fibrosa	4	0.3636	4	0.1755	Uninformative
	Angophora costata	3	0.2727	3	0.1223	Uninformative
	Eucalyptus resinifera	4	0.2727	1	0.03156	Uninformative
	Eucalyptus agglomerata	1	0.1818	1	0.00789	Uninformative
	Eucalyptus crebra	4	0.1818	4	0.217	Uninformative
	Eucalyptus eugenioides	2	0.1818	2	0.146	Uninformative

Eucalyptus sclerophylla	4	0.1818	4	0.1045	Uninformative
Eucalyptus haemastoma	1	0.09091	3	0.001972	Uninformative
Eucalyptus paniculata	2	0.09091	4	0.01183	Uninformative
Eucalyptus pilularis	4	0.09091	4	0.1105	Uninformative
Eucalyptus sieberi	1	0.09091	4	0.00789	Uninformative
Eucalyptus tereticornis	2	0.09091	4	0.3176	Uninformative

152. Blue Gum High Forest

Sample Sites: (7) **CAM67HAV**, HOR01GNL, HOR02GNM, HOR03WPM, HOR04GNM, KUR02LHL, KUR10GYV

Community Examples on Public Land (tenure): Cumberland State Forest (SF); Dalrymple-Hay Nature Reserve (NPWS)

Area (ha 1750/1997): 3720/168 **Proportion Extant:** 4.5%
No. Taxa (total/unique): 132/15 **No. Taxa per Plot (±sd):** 44.1 (8.6)
Previous Floristic Classifications:

Blue Gum High Forest is dominated by either *Eucalyptus pilularis* or *E. saligna*. *Angophora costata* is also frequently observed in remnants close to the shale/sandstone boundary, but would have occurred infrequently on deep shale soils. A relatively diverse stratum of small trees is usually present, and includes *Pittosporum undulatum, Elaeocarpus reticulatis* and *Allocasuarina torulosa*. Shrub species are typically mesic, such as *Breynia oblongifolia, Pittosporum revolutum, Clerodendrum tomentosum, Notelaea longifolia f. longifolia, Maytenus sylvestis, Polyscius sambucifolia subsp. A* and *Rapanea variabilis*. Sclerophyllous species such as *Persoonia linearis* and *Leucopogon juniperinum* occur more frequently approaching the shale/sandstone boundary. The ground stratum is often dense and contains a mixture of herb, grass and fern species including *Adiantum aethiopicum, Entolasia marginata, Lomandra longifolia, Calochlaena dubia, Dianella caerulea, Pseuderanthemum variabile* and *Oplismenus imbecilis*. Vine species are also frequently present, in particular *Tylophora barbata, Eustrephus latifolia, Clematis aristata* and *Pandorea pandorana*.

Blue Gum High Forest, listed as endangered under the *Threatened Species Conservation Act 1995*, is restricted to areas of shale derived soil receiving more 1050mm rainfall per year. The community is generally confined to altitudes higher than 100 m above sea level on the Hornsby Plateau. In lower rainfall zones it grades into Turpentine Ironbark Forest. Approaching the shale sandstone boundary, Blue Gum High Forest grades into Map Unit 43(Turpentine Ironbark Margin Forest).

Habitat:
Parent Geology: Wianamatta Shale (57%), Hawkesbury Sandstone (29%), Mittagong Formation (14%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	113.7 (44.1)	6.8 (5.3)	1050 (183.1)	15.3 (2.3)	27.4 (1.2)	214.7 (5.0)
Range	50 - 178	2.6 – 17.3	816 – 1250	12 – 18	26.2 – 29.0	205 – 218

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	39.3 (16.2)	30.7 (13.7)
Small Tree	86	14.7 (0.8)	20.0 (15.8)
Shrub	86	4.8 (1.3)	8.0 (4.0)
Forb	100	1.7 (1.6)	44.2 (30.2)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Allocasuarina torulosa	3	0.8571	2	0.08219	positive
	Pittosporum undulatum	3	0.7143	2	0.06654	positive
	Angophora costata	4	0.5714	3	0.1194	positive
	Elaeocarpus reticulatus	3	0.5714	1	0.05871	positive
	Acmena smithii	1	0.4286	0	0	positive
	Brachychiton acerifolius	1	0.2857	0	0	positive
	Ficus coronata	1	0.2857	0	0	positive
	Cupaniopsis anacardioides	1	0.1429	0	0	positive
	Duboisia myoporoides	2	0.1429	0	0	positive
Shrub	Breynia oblongifolia	2	0.8571	2	0.1977	positive
	Pittosporum revolutum	3	0.8571	2	0.06262	positive
	Leucopogon juniperinus	2	0.7143	2	0.184	positive
	Maytenus silvestris	2	0.7143	2	0.03131	positive
	Clerodendrum tomentosum	2	0.5714	1	0.07632	positive
	Notelaea longifolia f. longifolia	2	0.5714	1	0.1781	positive
	Persoonia linearis	2	0.5714	2	0.3131	positive
	Polyscias sambucifolia subsp. A	3	0.5714	1	0.06849	positive
	Rapanea variabilis	3	0.5714	2	0.07436	positive
	Platylobium formosum	3	0.4286	0	0	positive
	Myoporum acuminatum	1	0.1429	0	0	positive
	Bursaria spinosa	1	0.2857	3	0.5832	negative
Ground	Adiantum aethiopicum	3	1	3	0.1096	positive
	Lomandra longifolia	3	1	2	0.2779	positive
	Entolasia marginata	3	0.8571	2	0.2857	positive
	Calochlaena dubia	2	0.7143	2	0.0137	positive
	Dianella caerulea	2	0.7143	2	0.2074	positive
	Pseuderanthemum variabile	3	0.7143	2	0.07241	positive
	Blechnum cartilagineum	4	0.5714	1	0.0137	positive
	Oplismenus imbecillis	3	0.5714	2	0.08023	positive
	Poa affinis	3	0.5714	2	0.06067	positive
	Pratia purpurascens	3	0.5714	2	0.4423	positive
	Carex maculata	2	0.2857	0	0	positive
	Blechnum nudum	2	0.1429	0	0	positive
	Christella dentata	1	0.1429	0	0	positive
	Cryptostylis subulata	1	0.1429	0	0	positive
	Gahnia clarkei	2	0.1429	0	0	positive
	Entolasia stricta	1	0.4286	3	0.5166	negative
	Dichondra repens	2	0.2857	3	0.5558	negative
	Microlaena stipoides var. stipoides	3	0.2857	3	0.7671	negative
	Themeda australis	2	0.2857	3	0.6262	negative
	Cheilanthes sieberi subsp. sieberi	0	0	2	0.6145	negative
	Lomandra multiflora subsp. multiflora	0	0	2	0.5147	negative
	Muellerina eucalyptoides	1	0.1429	0	0	positive
	Tylophora barbata	2	1	2	0.02935	positive
	Eustrephus latifolius	3	0.8571	1	0.04892	positive
	Clematis aristata	2	0.7143	2	0.05088	positive
	Pandorea pandorana	3	0.7143	2	0.0998	positive
	Glycine clandestina	2	0.5714	2	0.4403	positive

	Morinda jasminoides	4	0.5714	1	0.02544	positive
	Hibbertia scandens	1	0.1429	0	0	positive
	Rubus hillii	1	0.1429	0	0	positive
Tree	Eucalyptus pilularis	5	0.4286	4	0.1057	uninformative
	Eucalyptus saligna	5	0.4286	4	0.009785	uninformative
	Angophora floribunda	3	0.2857	2	0.09002	uninformative
	Eucalyptus globoidea	1	0.2857	2	0.06262	uninformative
	Eucalyptus paniculata	4	0.2857	2	0.009785	uninformative
	Corymbia gummifera	1	0.1429	2	0.2231	uninformative
	Eucalyptus punctata	1	0.1429	3	0.2583	uninformative
	Eucalyptus tereticornis	2	0.1429	4	0.3151	uninformative
	Syncarpia glomulifera	1	0.1429	3	0.1174	uninformative

Sandstone Communities

The following communities are not the primary subjects of this study, although they have been recognised during the mapping process as they occur adjacent to the target vegetation. As they are not the subject of this study, detailed statistics on distribution, zoning, etc have not been produced (and, indeed, would not have been accurate as the study area did not cover the entire distributions of these communities).

These community descriptions have been included in this document in order to allow users of the maps of western Sydney vegetation to distinguish between communities at the edges of the study area.

31. Sandstone Ridgetop Woodland

Sample Sites: (23) APP19LHU, APP43LHM, CAM41HAM, CAM42LHU, CAM49LHC, CAM75BTU, APP10LHU, APP11LHC, APP13HAL, APP44LHM, APP47HAM, **BOT13BTC**, CAM100LH, CAM101LH, CAM104LH, CAM105LH, CAM106LH, LIV56LHL, POR02LHC, POR04LHM, POR06HAM, POR08LHU, POR09HAM

Area (ha 1750/1997): not calculated
Proportion Extant: not calculated
No. Taxa (total/unique): 252/15
No. Taxa per Plot (±sd): 55.9 (6.7)

Sandstone Ridgetop Woodland is dominated by *Corymbia gummifera* and *Eucalyptus sclerophylla* with *Banksia serrata* frequently present at lower abundance. A variety of other tree species occur more sporadically, including *E. punctata*, *E. oblonga* and *Angophora costata*. A diverse array of shrub species is always present, although depending on the time of the last fire a shrub stratum may not be fully developed. Shrub species frequently recorded included *Banksia spinulosa* var. *spinulosa*, *Isopogon anemonifolius*, *Leptospermum trinervium*, *Phyllanthus hirtellus*, *Dillwynia retorta* and *Eriostemon australasius* subsp. *australasius*. The ground stratum is similarly diverse and features species such as *Lomandra obliqua*, *Entolasia stricta*, *Cyathochaeta diandra*, *Dampiera stricta* and *Stipa pubescens*.

As the name implies, this community occurs predominantly on sandstone ridgetops and plateaux, but may extend to the floor of shallow gullies. Sandstone Ridgetop Woodland is structurally variable and may lack a tree stratum. Shrub density is highly variable, with the density of serotinous obligate seeders varying as a function of fire frequency. In steeper gullies, woodland grades into one of two forms of Sandstone Gully Forest, depending on rainfall. Isolated patches of Rock Pavement Heath occur sporadically within the woodland, predominantly along the ridge lines. In poorly drained areas Woodland abruptly changes to sedgeland.

Previous Floristic Classifications:
Sandstone Ridgetop Woodland is equivalent to Sydney Sandstone Ridgetop Woodland described by Benson (1994). Five communities recognised by Keith (1994) based on structural variation and soil characteristics are amalgamated under this classification. These include Ironstone Heath, Ironstone Woodland, Sandstone Woodland, Heath Woodland and Mallee Heath.

Habitat:
Parent Geology: Hawkesbury Sandstone (66%), Mittagong formation (31%), Holocene Alluvium (3%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Terrain (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	239.9 (104.1)	6.2 (5.2)	1178.8(159.8)	20.0 (9.0)	10.6 (13.5)	25.5 (8.1)	212.1 (3.9)
Range	1 – 412	0 – 29.3	837 – 1509	2 - 49	-37 – 47	24.3 – 28.3	187 – 219

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	13.6 (4.8)	12.2 (5.9)
Small Tree	50	5.9 (1.4)	14.5 (12.2)
Shrub	96	2.4 (1.1)	21.7 (15.2)
Forb	100	0.5 (0.6)	17.3 (15.7)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Corymbia gummifera	3	0.9545	2	0.1895	positive
	Banksia serrata	2	0.7273	2	0.03629	positive
	Eucalyptus sclerophylla	3	0.5909	4	0.08468	positive
	Bursaria spinosa	0	0	3	0.6048	negative
Shrub	Banksia spinulosa var. spinulosa	2	0.9545	2	0.1532	positive
	Isopogon anemonifolius	2	0.9545	2	0.07258	positive
	Leptospermum trinervium	2	0.9545	2	0.1956	positive
	Phyllanthus hirtellus	2	0.9545	2	0.244	positive
	Dillwynia retorta	2	0.8182	2	0.08871	positive
	Eriostemon australasius subsp. australasius	2	0.8182	2	0.06855	positive
	Bossiaea heterophylla	2	0.7727	2	0.02823	positive
	Platysace linearifolia	2	0.7727	2	0.05645	positive
	Lambertia formosa	2	0.7273	2	0.05847	positive
	Acacia ulicifolia	2	0.6818	1	0.1673	positive
	Hakea sericea	2	0.6818	2	0.1492	positive
	Acacia linifolia	2	0.6364	2	0.1028	positive
	Acacia suaveolens	2	0.6364	2	0.04637	positive
	Petrophile sessilis	2	0.6364	2	0.02016	positive
	Pimelea linifolia subsp. linifolia	2	0.5455	2	0.2399	positive
	Xanthosia pilosa	2	0.5455	2	0.09677	positive
	Acacia terminalis	2	0.5	2	0.1593	positive
	Lasiopetalum rufum	1	0.1818	0	0	positive
	Hakea teretifolia	1	0.1364	0	0	positive
	Baeckea ramosissima subsp. ramosissima	1	0.09091	0	0	positive
	Banksia ericifolia	4	0.09091	0	0	positive
	Allocasuarina distyla	1	0.04545	0	0	positive
	Baeckea imbricata	1	0.04545	0	0	positive
	Mirbelia speciosa subsp. speciosa	1	0.04545	0	0	positive
	Phyllota grandiflora	4	0.04545	0	0	positive
Ground	Lomandra obliqua	2	1	2	0.1976	positive
	Entolasia stricta	2	0.9545	3	0.496	positive
	Cyathochaeta diandra	3	0.8182	2	0.1431	positive
	Dampiera stricta	2	0.7273	1	0.02823	positive
	Stipa pubescens	2	0.7273	3	0.2036	positive
	Lepyrodia scariosa	2	0.6364	2	0.04032	positive
	Lomandra cylindrica	2	0.5909	2	0.121	positive
	Lepidosperma laterale	2	0.5455	2	0.4153	positive
	Xanthorrhoea media	3	0.5	1	0.04637	positive
	Schizaea dichotoma	1	0.1364	0	0	positive
	Drosera peltata	2	0.09091	0	0	positive
	Poranthera corymbosa	1	0.09091	0	0	positive
	Blandfordia nobilis	1	0.04545	0	0	positive
	Schoenus turbinatus	3	0.04545	0	0	positive
	Thysanotus juncifolius	1	0.04545	0	0	positive
	Xyris gracilis	2	0.04545	0	0	positive
	Microlaena stipoides var. stipoides	1	0.2273	3	0.7843	negative
	Themeda australis	2	0.1818	3	0.6411	negative

	Aristida vagans	1	0.04545	2	0.506	negative
	Cheilanthes sieberi subsp. sieberi	1	0.04545	2	0.631	negative
	Dichondra repens	0	0	3	0.5766	negative
	Cassytha pubescens	2	0.5	2	0.1472	positive
Tree	Eucalyptus punctata	2	0.3182	3	0.254	uninformative
	Angophora costata	3	0.2727	3	0.119	uninformative
	Eucalyptus oblonga	1	0.2273	2	0.06048	uninformative
	Eucalyptus piperita subsp. piperita	4	0.2273	1	0.02621	uninformative
	Angophora bakeri	3	0.1364	2	0.125	uninformative
	Eucalyptus sieberi	4	0.1364	4	0.004032	uninformative
	Eucalyptus globoidea	4	0.09091	2	0.06452	uninformative
	Eucalyptus agglomerata	1	0.04545	1	0.01008	uninformative
	Eucalyptus haemastoma	3	0.04545	1	0.002016	uninformative
	Eucalyptus parramattensis subsp. parramattensis	3	0.04545	2	0.04234	uninformative
	Eucalyptus pilularis	4	0.04545	4	0.1129	uninformative
	Eucalyptus squamosa	2	0.04545	1	0.004032	uninformative
	Syncarpia glomulifera	2	0.04545	3	0.121	uninformative

32. Upper Georges River Sandstone Woodland

Sample Sites: (45) APP17HAU, APP20HAC, APP25LHU, APP27LHU, APP29LHL, APP30LHC, APP31LHC, APP32LHU, APP36BTC, APP39BTC, APP40LHM, APP42LHU, APP46LHU, **BOT03BGF**, CAM43LHC, CAM45LHU, CAM46LHU, CAM47HAL, CAM48HAU, CAM50LHC, CAM54HAU, CAM58LHC, CAM59HAU, CAM61LHM, CAM62LHU, CAM63LHU, CAM65BTC, CAM66BTU, CAM69LHM, CAM70HAC, CAM72HAM, CAM74LHU, CAM78LHU, CAM81LHU, CAM84HAC, CAM86LHU, CAM90BTF, CAM92HAM, CAM95LHM, CAM96LHM, CAM97LHM, CAM99BTM, APP12LHC, CAM107LH, POR10BTC

Area (ha 1750/1997): not calculated
Proportion Extant: not calculated
No. Taxa (total/unique): 269/5
No. Taxa per Plot ($\pm$sd): 53.8 (7.5)

Upper Georges River Sandstone Woodland is dominated by *Eucalyptus punctata* and *Corymbia gummifera,* with *E. oblonga* occurring frequently at lower abundance. *Allocasuarina littoralis* is frequently present, particularly on the upper slopes of gullies where it forms a small tree layer. Diverse shrub and ground strata are always present. Typical shrub species include *Acacia ulicifolia, A. terminalis, A. linifolia, Persoonia linearis, Leptospermun trinervium* and *Exocarpus strictus*. The ground stratum is often dominated by grass species such as *Entolasia stricta, Themeda australis, Stipa pubescens Aristida vagans* and *Danthonia linkii*. Other species frequently recorded in the ground stratum include *Dianella revoluta, Pomax umbellata, Lepidosperma laterale, Cyathochaeta diandra, Lomandra multiflora* and *Lomandra cylindrica*.

Survey sites representative of Upper Georges River Sandstone Woodland were restricted to a narrow zone adjoining the south-eastern boundary of the Cumberland Plain between Appin and Holsworthy. South of Campbelltown the community is restricted to within 1 km of the shale/sandstone boundary, but this zone extends to approximately 4.5 km at the northern end of the range. This community is typically found on upper slopes and ridges, with *E. pilularis* becoming dominant descending into the gullies. The majority of survey sites were located on soils derived from the Mittagong Formation, but some were located on other geologies. Soils were always sandy in texture, and sandstone outcropping was evident at most sites. Nevertheless, a strong shale influence in the soil was implied by landscape position and the proximity to the shale/sandstone boundary. The boundary with communities occurring on soils derived from shale is usually abrupt. Upper Georges River Sandstone Woodland grades into Sandstone Ridgetop Woodland with increasing distance from the shale/sandstone boundary. Descending into gullies, the community grades into Western Sandstone Gully Forest. This transition may be relatively abrupt on steeper slopes, and is often associated with a break in slope. The Mittagong Formation also outcrops extensively along the north and north-western boundaries of the Cumberland Plain. Further sampling in these areas is likely to reveal similar communities of plant species.

Previous Floristic Classifications:
Upper Georges River Sandstone Woodland is likely to be floristically similar to Sandstone/Shale Transition community described by Benson and Howell (1994) in the Bargo area.

Habitat:
Parent Geology: Mittagong Formation (65%), Wianamatta Shale (17%), Hawkesbury Sandstone (17%), Tertiary Alluvium (1%)

	Elevation (m)	Slope (^{o} above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (^{o}C)	Solar Radiation, January	Distance to Shale (m)
Mean ($^{\pm}$sd)	129.8 (61.8)	4.7 (4.8)	932.0 (43.4)	15.5 (7.0)	26.8 (3.8)	215.1 (3.2)	694.6 (774.0)
Range	23 – 275	0 – 20.5	855 – 1069	3 – 32	25.7 – 27.4	200 – 218	0 – 4536.6

Structure:

Growth Form	Frequency (%)	Mean Height (m) ($^{\pm}$sd)	Mean Foliage Cover (%)($^{\pm}$sd)
Tree	100	16.3 (3.9)	21.4 (10.4)
Small Tree	43	8.1 (2.3)	10.2 (6.0)
Shrub	98	2.6 (0.9)	16.3 (14.6)
Forb	100	0.6 (0.6)	26.6 (17.7)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus punctata	4	0.8696	3	0.197	Positive
	Corymbia gummifera	3	0.8261	2	0.1631	Positive
	Allocasuarina littoralis	3	0.7391	2	0.2076	Positive
	Eucalyptus oblonga	2	0.5	2	0.02542	Positive
	Eucalyptus capitellata	1	0.02174	0	0	Positive
Shrub	Phyllanthus hirtellus	2	0.9348	2	0.2097	Positive
	Acacia ulicifolia	2	0.8261	1	0.1271	Positive
	Acacia terminalis	2	0.7174	2	0.1208	Positive
	Persoonia linearis	2	0.7174	2	0.2775	Positive
	Leptospermum trinervium	2	0.6957	2	0.1822	positive
	Pimelea linifolia subsp. linifolia	2	0.6957	2	0.2097	positive
	Acacia linifolia	2	0.6522	1	0.07415	positive
	Exocarpos strictus	2	0.6087	1	0.08051	positive
	Lissanthe strigosa	2	0.6087	2	0.1716	positive
	Hakea sericea	2	0.587	2	0.1314	positive
	Monotoca scoparia	2	0.5652	1	0.06992	positive
	Kunzea ambigua	2	0.5217	2	0.1716	positive
	Dillwynia retorta	2	0.5	2	0.08263	positive
	Cassinia arcuata	2	0.02174	0	0	positive
	Bursaria spinosa	1	0.06522	3	0.6292	negative
Ground	Entolasia stricta	3	0.9783	3	0.4703	positive
	Lomandra obliqua	2	0.9565	2	0.161	positive
	Dianella revoluta var. revoluta	2	0.9348	2	0.3008	positive
	Pomax umbellata	2	0.8043	2	0.2966	positive
	Lepidosperma laterale	2	0.7826	2	0.3856	positive
	Stipa pubescens	3	0.7826	2	0.1716	positive
	Cyathochaeta diandra	2	0.7391	3	0.1165	positive
	Lomandra multiflora subsp. multiflora	2	0.7391	2	0.4852	positive
	Danthonia linkii	2	0.6522	2	0.1038	positive
	Lomandra cylindrica	2	0.6304	2	0.09322	positive
	Aristida vagans	2	0.6087	2	0.4746	positive
	Gonocarpus tetragynus	2	0.5217	2	0.1801	positive
	Poa labillardieri	2	0.5217	2	0.1843	positive
	Xanthorrhoea concava	2	0.5	1	0.04661	positive
	Acianthus pusillus	2	0.02174	0	0	positive
	Cryptandra propinqua	1	0.02174	0	0	positive

	Schoenus villosus	1	0.02174	0	0	positive
	Microlaena stipoides var. stipoides	1	0.6087	3	0.7754	negative
	Cheilanthes sieberi subsp. sieberi	2	0.4565	2	0.6208	negative
	Dichondra repens	1	0.02174	3	0.6038	negative
	Themeda australis	3	0.8261	3	0.6017	constant
	Cassytha pubescens	2	0.6957	2	0.1102	positive
Tree	Angophora costata	2	0.3696	3	0.1017	uninformative
	Angophora bakeri	2	0.3478	2	0.1038	uninformative
	Eucalyptus pilularis	3	0.3261	4	0.08898	uninformative
	Syncarpia glomulifera	2	0.3043	3	0.09958	uninformative
	Eucalyptus sclerophylla	4	0.2391	4	0.09322	uninformative
	Eucalyptus resinifera	2	0.1304	1	0.02754	uninformative
	Eucalyptus crebra	1	0.06522	4	0.2309	uninformative
	Eucalyptus eugenioides	4	0.06522	2	0.1547	uninformative
	Eucalyptus globoidea	4	0.04348	2	0.0678	uninformative
	Eucalyptus agglomerata	2	0.02174	1	0.01059	uninformative
	Eucalyptus fibrosa	4	0.02174	4	0.1949	uninformative
	Eucalyptus paniculata	1	0.02174	4	0.01271	uninformative
	Eucalyptus piperita subsp. piperita	1	0.02174	3	0.03602	uninformative
	Eucalyptus sieberi	4	0.02174	4	0.008475	uninformative
	Eucalyptus squamosa	1	0.02174	2	0.004237	uninformative

33. Western Sandstone Gully Forest

Sample Sites: (36) APP15BTM, APP16HAL, APP18HAL, APP26HAM, APP28LHL, APP33HAM, APP38HAL, APP45HAL, CAM44HAL, CAM64HAL, CAM68HAL, CAM71HAL, CAM73LHM, CAM76HAL, CAM77HAM, CAM79HAU, CAM82HAM, CAM83HAC, CAM87HAL, CAM88HAU, CAM94HAL, APP41HAL, BOT05LHC, BOT07GYC, BOT08HAM, BOT09HAM, BOT10HAU, BOT11HAM, BOT14LHU, CAM39HAM, CAM40HAL, LIV53LHL, LIV54GYU, LIV55GYM, POR05LHU, POR07HAM

Area (ha 1750/1997): not calculated
Proportion Extant: not calculated
No. Taxa (total/unique): 269/17
No. Taxa per Plot (±sd): 53.9 (9.6)

Western Sandstone Gully Forest is dominated by *Angophora costata, Corymbia gummifera* and *E. pilularis*, with *E. punctata* occurring sporadically on mid-slopes. A sparse layer of smaller trees is usually present, and dominated by *Ceratopetalum gummiferum* and *Allocasuarina littoralis*. The shrub and ground strata are also sparse and often contain slightly fewer species relative to ridgetop communities. Shrub species include *Acacia terminalis, Leptospermum trinervium, Persoonia linearis* and *Banksia spinulosa* var. *spinulosa*. In the ground stratum, the fern species *Pteridium esculentum* is invariably present, along with the climber *Smilax glycyphylla*. These species were seldom recorded in other communities. Other species frequently recorded in the ground stratum include *Entolasia stricta, Dianella caerulea, Lomandra obliqua, L. longifolia, L. gracilis, Lepidosperma laterale* and *Gonocarpus teucriodes*.

Western Sandstone Gully Forest occurs on the lower slopes of sandstone gullies on the western side of the Woronora Plateau where annual rainfall falls below approximately 1050 mm. The gradation into Sandstone Ridgetop woodland generally occurs less than half way up the slope from the gully floor. In particularly sheltered gullies, mesic species such as *Backhousia myrtifolia* and *Pittosporum undulatum* form a dense small tree stratum. Vines such as *Cissus hypoglauca* may also be locally abundant, and dense patches of fern such as *Caloclaena dubia* also occur. A narrow band of Riparian Scrub usually occupies the creekline.

Previous Floristic Classifications:
Western Sandstone Gully Forest was described by Keith (1994) under the name Western Gully Forest.

Habitat:
Parent Geology: Hawkesbury Sandstone (82%), Mittagong Formation (18%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Terrain (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	101.2 (66.7)	17.1 (9.2)	956.5 (66.1)	23.1 (8.1)	-13.5 (20.5)	26.7 (0.4)	205.7 (9.6)
Range	4 – 264	1.3 – 35.0	846 – 1081	11 – 46	-48 – 54	25.9 – 27.4	182 – 218

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	22.4 (4.3)	17.8 (8.9)
Small Tree	67	9.5 (3.5)	11.8 (7.1)
Shrub	86	2.8 (1.1)	18.8 (15.4)
Forb	100	0.8 (0.7)	14.3 (13.6)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Angophora costata	4	0.8056	2	0.07469	positive
	Corymbia gummifera	2	0.7778	3	0.1805	positive
	Ceratopetalum gummiferum	2	0.75	1	0.02075	positive
	Eucalyptus pilularis	4	0.6944	4	0.06639	positive
	Allocasuarina littoralis	2	0.6111	2	0.2282	positive
	Banksia integrifolia var. integrifolia	1	0.02778	0	0	positive
Shrub	Acacia terminalis	2	0.9167	2	0.1183	positive
	Xanthosia pilosa	2	0.8889	2	0.05809	positive
	Leptospermum trinervium	2	0.8611	2	0.1805	positive
	Persoonia linearis	2	0.8333	2	0.278	positive
	Phyllanthus hirtellus	2	0.6389	2	0.2469	positive
	Platysace linearifolia	2	0.6111	2	0.04772	positive
	Banksia spinulosa var. spinulosa	2	0.5833	2	0.1577	positive
	Cassinia longifolia	2	0.1111	0	0	positive
	Podocarpus spinulosus	2	0.1111	0	0	positive
	Zieria pilosa	1	0.1111	0	0	positive
	Epacris longiflora	3	0.05556	0	0	positive
	Crowea saligna	1	0.02778	0	0	positive
	Hibbertia cistiflora	2	0.02778	0	0	positive
	Hovea purpurea	1	0.02778	0	0	positive
	Leucopogon amplexicaulis	4	0.02778	0	0	positive
	Olearia tomentosa	1	0.02778	0	0	positive
Ground	Pteridium esculentum	3	0.9722	2	0.07054	positive
	Entolasia stricta	3	0.9444	3	0.4834	positive
	Dianella caerulea	2	0.8889	1	0.1639	positive
	Lomandra obliqua	2	0.8333	2	0.1867	positive
	Lomandra longifolia	2	0.7222	2	0.2552	positive
	Lepidosperma laterale	2	0.6944	2	0.4004	positive
	Lomandra gracilis	2	0.6667	2	0.07054	positive
	Gonocarpus teucrioides	2	0.6389	2	0.04149	positive
	Dianella revoluta var. revoluta	2	0.6111	2	0.3382	positive
	Lomandra cylindrica	2	0.5	2	0.1141	positive
	Pomax umbellata	2	0.5	2	0.3299	positive
	Doryanthes excelsa	2	0.08333	0	0	positive
	Lepidosperma viscidium	1	0.08333	0	0	positive
	Liparis reflexa	3	0.02778	0	0	positive
	Psilotum nudum	2	0.02778	0	0	positive
	Pterostylis nutans	2	0.02778	0	0	positive
	Senecio bipinnatisectus	2	0.02778	0	0	positive
	Microlaena stipoides var. stipoides	2	0.4167	3	0.7863	negative
	Cheilanthes sieberi subsp. Sieberi	1	0.3333	2	0.6266	negative
	Aristida vagans	1	0.25	2	0.5041	negative
	Themeda australis	2	0.25	3	0.6494	negative
	Bursaria spinosa	2	0.1667	3	0.61	negative
	Dichondra repens	0	0	3	0.5934	negative
	Lomandra multiflora subsp. multiflora	2	0.5833	2	0.5021	constant
	Dendrobium speciosum	1	0.02778	0	0	positive
	Smilax glyciphylla	2	0.8889	1	0.06846	positive
Tree	Eucalyptus punctata	1	0.3333	3	0.251	uninformative
	Eucalyptus piperita subsp. piperita	4	0.2778	1	0.0166	uninformative

Angophora bakeri	2	0.1944	2	0.1203	uninformative
Eucalyptus agglomerata	1	0.05556	1	0.008299	uninformative
Angophora floribunda	1	0.02778	2	0.09751	uninformative

34. Mangrove/Saltmarsh Complex

Sample Sites: (3) BOT06MCD, BOT15MCF, POR03MCD
Area (ha 1750/1997): not calculated **Proportion Extant:** not calculated
No. Taxa (total/unique): 15/8 **No. Taxa per Plot (±sd):** 6.3 (7.5)

Mangrove and Saltmarsh communities were poorly sampled in this survey and were therefore amalgamated as a complex for mapping. The three sites surveyed were relatively poor in species, and only three species were recorded more than once: *Avicennia marina* var. *australasica*, *Aegiceras corniculatum* and *Sarcocornia quinqueflora* subsp. *quinqueflora*. Further sampling is required to adequately characterise the floristic composition of this complex.

Habitat:

Parent Geology: Estuarine (100%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	1.3 (0.6)	1.1 (0.2)	1025.3 (59.8)	11.3 (13.7)	26.4 (0.6)	217.7 (0.6)
Range	1 – 2	0.9 – 1.3)	985 – 1094	2 – 27	25.7 – 26.7	217 – 218

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	67	10.5 (2.1)	42.5 (38.9)
Small Tree	33	3.0 (-)	60.0-)
Shrub	-	-	-
Forb	67	-	-

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Avicennia marina var. australasica	6	1	0	0	positive
	Aegiceras corniculatum	2	0.6667	0	0	positive
Ground	Sarcocornia quinqueflora subsp. quinqueflora	3	0.6667	0	0	positive
	Apium prostratum	2	0.3333	0	0	positive
	Juncus kraussii	4	0.3333	0	0	positive
	Samolus repens	2	0.3333	0	0	positive
	Sporobolus virginicus var. minor	3	0.3333	0	0	positive
	Suaeda australis	3	0.3333	0	0	positive
	Microlaena stipoides var. stipoides	2	0.3333	3	0.7631	negative
	Bursaria spinosa	0	0	3	0.5825	negative
	Cheilanthes sieberi subsp. sieberi	0	0	2	0.6097	negative
	Dichondra repens	0	0	3	0.5553	negative
	Entolasia stricta	0	0	3	0.5184	negative
	Lomandra multiflora subsp. multiflora	0	0	2	0.5107	negative
	Themeda australis	0	0	3	0.6252	negative
Tree	Casuarina glauca	3	0.3333	3	0.03689	uninformative

35 Riparian Scrub

Sample Sites: (3) CAM103HA, CAM91HAV, KUR11HAV

Area (ha 1750/1997): not calculated
Proportion Extant: not calculated
No. Taxa (total/unique): 220/39
No. Taxa per Plot (±sd): 40.3 (12.0)

Riparian Scrub is dominated by *Ceratopetalum apetalum* and *Tristaniopsis laurina*. *Angophora costata* is frequently present along the banks of smaller streams. Along the Georges River *Eucalyptus pilularis* is more common, but this species is restricted to the river banks and was rarely recorded in a survey site. Common species recorded in the shrub stratum include *Lomatia myricoides, Acacia obtusifolia, Leptospermum morrisoni* and *Grevillea oleoides*. The shrub stratum is locally dense, but shrub patches are frequently interspersed between rock pavement, recent deposits of sediment and water. The ground stratum is similarly variable. *Schoenus melanostachys, Sticherus flabellatus* and *Todea barbara* occur frequently on the banks and consolidated sediments within streams. Water plants such as *Triglochin procerum* occur intermittently.

Previous Floristic Classifications:
Riparian Scrub was described by Keith (1994).

Habitat:
Parent Geology: Hawkesbury Sandstone (100%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	154.6 (111.6)	11.4 (4.7)	1063.4(180.2)	26.5 (6.3)	26.4 (1.1)	207.7 – 4.8
Range	10 – 349	4.5 – 19.6	864 – 1524	13 – 34	24.6 – 28.5	198 – 216

Structure:

Growth Form	Frequency (%)	Mean Height (m) (±sd)	Mean Foliage Cover (%)(±sd)
Tree	100	12 (7.2)	40.3 (34.1)
Small Tree	33	10.0 (-)	5.0 (-)
Shrub	67	2.5 (0.7)	10.0 (7.1)
Forb	100	1.0 (-)	20 (-)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Stenocarpus salignus	2	1	1	0.01165	positive
	Tristaniopsis laurina	3	1	1	0.005825	positive
	Backhousia myrtifolia	3	0.6667	4	0.0233	positive
	Ceratopetalum apetalum	5	0.6667	0	0	positive
	Callicoma serratifolia	1	0.3333	0	0	positive
	Tristania neriifolia	1	0.3333	0	0	positive
Shrub	Lomatia myricoides	3	1	2	0.007767	positive
	Acacia floribunda	2	0.6667	2	0.07573	positive
	Daviesia corymbosa	2	0.6667	1	0.007767	positive
	Dodonaea triquetra	2	0.6667	2	0.1126	positive

	Grevillea oleoides	3	0.6667	1	0.001942	positive
	Micrantheum hexandrum	2	0.6667	0	0	positive
	Westringia longifolia	2	0.6667	1	0.01165	positive
	Haloragis exalata	1	0.3333	0	0	positive
	Leptospermum morrisonii	3	0.3333	0	0	positive
Ground	Adiantum aethiopicum	2	0.6667	3	0.1184	positive
	Blechnum cartilagineum	2	0.6667	3	0.01748	positive
	Lomandra longifolia	3	0.6667	2	0.2854	positive
	Oplismenus imbecillis	3	0.6667	2	0.0835	positive
	Poa affinis	2	0.6667	3	0.06408	positive
	Schoenus melanostachys	2	0.6667	1	0.02136	positive
	Viola hederacea	2	0.6667	2	0.01553	positive
	Cyathea leichhardtiana	1	0.3333	0	0	positive
	Gleichenia dicarpa	2	0.3333	0	0	positive
	Lomandra fluviatilis	3	0.3333	0	0	positive
	Schelhammera undulata	1	0.3333	0	0	positive
	Todea barbara	3	0.3333	0	0	positive
	Veronica calycina	2	0.3333	0	0	positive
	Bursaria spinosa	1	0.3333	3	0.5806	negative
	Microlaena stipoides var. stipoides	3	0.3333	3	0.7631	negative
	Themeda australis	1	0.3333	3	0.6233	negative
	Cheilanthes sieberi subsp. sieberi	0	0	2	0.6097	negative
	Dichondra repens	0	0	3	0.5553	negative
	Lomandra multiflora subsp. multiflora	0	0	2	0.5107	negative
	Entolasia stricta	3	0.6667	3	0.5146	constant
	Plectorrhiza tridentata	1	0.3333	0	0	positive
	Morinda jasminoides	2	0.6667	1	0.02913	positive
	Eucalyptus piperita subsp. piperita	1	0.3333	3	0.03301	uninformative
	Eucalyptus punctata	1	0.3333	3	0.2563	uninformative
	Eucalyptus saligna X botryoides	1	0.3333	5	0.001942	uninformative

61 Eastern Sandstone Gully Forest

Sample Sites: (51) 12E, 14D, 7D, SSSLF23, SSSLF25, SSSLF27, SSSLF28, SSSLF29, SSSLF30, SSSLF31, SSSLF32, SSES119, SSES201, SSES203, SSFL201, SSFL202, SSFL203, SSIS122, SSIS206, SSSG201, SSSG203, SSSG204, SSSS201, SSSS202, SWFL201, **W10S1**, **W11S4**, **W12S1**, **W13S1**, **W14S4, W17S3**, **W17S4**, **W18S1**, **W19S3**, **W20S1**, **W21S1**, **W21S2**, **W21S5**, **W22S3, W25S1**, **W25S3**, **W26S1**, **W26S2**, **W28S2**, **W28S3**, **W4S1**, **W7S1**, **W8S4**, **W9S2**, **W9S3**

No. Taxa (total/unique): 337/21 **No. Taxa per Plot (±sd):** 52.2 (12.6)

Habitat:

Parent Geology: Hawkesbury Sandstone (92%), Mittagong Formation (8%)

	Elevation (m)	Slope (° above horizontal)	Annual Rainfall (mm)	Ruggedness (900m)	Terrain (900 m)	Maximum Temperature, January (°C)	Solar Radiation, January
Mean (±sd)	226.4 (79.8)	12.8 (8.6)	1250.6(114.4)	26.3 (7.7)	-9.4 (19.9)	25.3 (0.5)	206.3 (7.1)
Range	80 – 360	0.4 – 33.1	1060 – 1598	13 – 42	-46 – 48	24.5 – 26.2	184 – 215

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Banksia serrata	2	0.8846	2	0.4737	positive
	Angophora costata	3	0.8462	3	0.386	positive
	Eucalyptus piperita subsp. piperita	3	0.8462	2	0.1988	positive
	Ceratopetalum gummiferum	2	0.6154	2	0.2865	positive
	Corymbia gummifera	2	0.6154	3	0.6491	constant
Shrub	Persoonia pinifolia	2	0.8846	1	0.3626	positive
	Bossiaea heterophylla	2	0.7308	1	0.4503	positive
	Hakea dactyloides	2	0.6154	1	0.5614	positive
	Lambertia formosa	2	0.6154	2	0.4854	positive
	Banksia ericifolia	2	0.5769	2	0.2749	positive
	Leptospermum polygalifolium subsp. Polygalifolium	2	0.5769	1	0.1462	positive
	Grevillea mucronulata	2	0.5385	1	0.269	positive
	Petrophile pulchella	2	0.5385	1	0.2222	positive
	Aotus ericoides	2	0.5	1	0.03509	positive
	Grevillea diffusa subsp. diffusa	2	0.5	2	0.2105	positive
	Acacia elongata	2	0.1538	0	0	positive
	Leptospermum grandifolium	2	0.1154	0	0	positive
	Banksia cunninghamii	1	0.07692	0	0	positive
	Callistemon subulatus	1	0.03846	0	0	positive
	Cassinia denticulata	2	0.03846	0	0	positive
	Choretrum candollei	1	0.03846	0	0	positive
	Platylobium formosum	4	0.03846	0	0	positive
	Platysace linearifolia	1	0.6538	2	0.5731	negative
	Banksia spinulosa var. spinulosa	1	0.6154	2	0.5497	negative
	Leptospermum trinervium	2	0.8077	2	0.7602	constant
Ground	Lepidosperma laterale	2	0.7308	2	0.4854	positive
	Caustis flexuosa	2	0.6923	2	0.3041	positive
	Lomandra longifolia	2	0.6538	2	0.3392	positive
	Pteridium esculentum	2	0.6538	2	0.4269	positive
	Doryanthes excelsa	3	0.5769	2	0.07602	positive

	Lycopodium deuterodensum	1	0.1538	0	0	positive
	Chloanthes stoechadis	1	0.07692	0	0	positive
	Gahnia erythrocarpa	2	0.07692	0	0	positive
	Gleichenia rupestris	1	0.07692	0	0	positive
	Restio complanatus	2	0.07692	0	0	positive
	Acianthus exsertus	1	0.03846	0	0	positive
	Blechnum wattsii	2	0.03846	0	0	positive
	Drosera binata	1	0.03846	0	0	positive
	Lepyrodia gracilis	2	0.03846	0	0	positive
	Tetrarrhena juncea	4	0.03846	0	0	positive
	Tetratheca shiressii	1	0.03846	0	0	positive
	Utricularia lateriflora	1	0.03846	0	0	positive
	Utricularia uliginosa	1	0.03846	0	0	positive
	Lomandra obliqua	1	0.4615	2	0.6374	negative
	Entolasia stricta	2	0.7308	2	0.731	constant
	Muellerina eucalyptoides	1	0.03846	0	0	positive
Tree	Eucalyptus sieberi	2	0.3077	3	0.08772	uninformative
	Eucalyptus haemastoma	2	0.1923	2	0.1637	uninformative
	Eucalyptus agglomerata	2	0.1538	2	0.06433	uninformative
	Eucalyptus punctata	2	0.1538	2	0.1871	uninformative
	Eucalyptus multicaulis	2	0.1154	3	0.04678	uninformative
	Eucalyptus oblonga	1	0.03846	2	0.1813	uninformative
	Eucalyptus polyanthemos subsp. vestita	1	0.03846	1	0.07018	uninformative

62 Woodland/Heath Complex (northeast and central)

Sample Sites: (16) `10D, 13D, 14B, 15E, 1F, 2C, 2F, 3E, 3F, 3H, 4F, 6C, 6D, 8B, 8D, 9D`

No. Taxa (total/unique): 155/6 **No. Taxa per Plot (±sd):** 45.6 (9.5)

Diagnostic Species:

Stratum	Name	Group score (50 percentile)	Group freq	Non-group score (50 percentile)	Non-group freq	Fidelity class
Tree	Eucalyptus haemastoma	3	0.5882	2	0.1278	positive
	Corymbia gummifera	2	0.4706	3	0.6611	negative
	Banksia serrata	2	0.2353	2	0.5556	negative
Shrub	Angophora hispida	3	1	3	0.1056	positive
	Hakea dactyloides	2	1	1	0.5278	positive
	Petrophile sessilis	3	1	2	0.2222	positive
	Isopogon anemonifolius	2	0.8235	2	0.45	positive
	Lambertia formosa	2	0.8235	2	0.4722	positive
	Pultenaea elliptica	3	0.8235	2	0.2556	positive
	Banksia oblongifolia	3	0.7647	1	0.1278	positive
	Leucopogon microphyllus var. microphyllus	2	0.7647	2	0.2056	positive
	Kunzea capitata	3	0.6471	2	0.08333	positive
	Phyllota phylicoides	2	0.6471	1	0.1111	positive
	Eriostemon australasius subsp. australasius	2	0.5882	2	0.4444	positive
	Grevillea sphacelata	2	0.5882	2	0.2056	positive
	Leptospermum arachnoides	2	0.5882	1	0.2056	positive
	Grevillea sericea	3	0.5294	2	0.1167	positive
	Micrantheum ericoides	2	0.5294	1	0.08333	positive
	Allocasuarina diminuta	4	0.1765	0	0	positive
	Leucopogon appressus	1	0.1765	0	0	positive
	Melichrus procumbens	1	0.05882	0	0	positive
	Platysace linearifolia	1	0.4118	2	0.6	negative
	Leptospermum trinervium	2	1	2	0.7444	constant
	Banksia spinulosa var. spinulosa	3	0.5294	2	0.5611	constant
Ground	Cyathochaeta diandra	4	1	2	0.4	positive
	Dampiera stricta	2	0.8824	1	0.3778	positive
	Lepyrodia scariosa	3	0.8824	2	0.3111	positive
	Actinotus minor	4	0.8235	2	0.3389	positive
	Ptilothrix deusta	4	0.8235	2	0.1889	positive
	Lomandra glauca	3	0.7647	1	0.2556	positive
	Lindsaea linearis	2	0.7059	1	0.2111	positive
	Patersonia sericea	2	0.7059	1	0.2389	positive
	Anisopogon avenaceus	2	0.5882	1	0.2333	positive
	Platysace ericoides	2	0.5882	2	0.2111	positive
	Schoenus moorei	3	0.1176	0	0	positive
	Comesperma defoliatum	1	0.05882	0	0	positive
	Helichrysum collinum	2	0.05882	0	0	positive
	Lepidosperma laterale	2	0.2353	2	0.5444	negative
	Pteridium esculentum	0	0	2	0.5	negative
	Lomandra obliqua	2	0.7059	2	0.6056	constant
	Entolasia stricta	2	0.5294	2	0.75	constant

	Cassytha pubescens	2	0.5882	2	0.4	positive
Tree	Eucalyptus squamosa	3	0.2941	2	0.01111	uninformative
	Eucalyptus oblonga	3	0.2353	2	0.1556	uninformative
	Eucalyptus punctata	1	0.05882	2	0.1944	uninformative

Appendix 2: Proportion of each vegetation community remaining by Local Government Area

Vegetation of AUBURN LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C +SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0			7.7	0.0%	0.0%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0		0.8		0.8		0.8	69.6	1.2%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.8*	*0.0*	*0.8*	*0.0*	*0.8*	*77.3*	*1.1%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest		2.5	16.5		19.0		3.3		3.3	4.3	26.6	1,481.4	1.8%	1.3%
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland					0.0				0.0				na	na
9 - Shale Hills Woodland					0.0				0.0				na	na
10 - Shale Plains Woodland	4.6				4.6		4.4		4.4	4.5	13.5	904.2	1.5%	0.5%
Sub-total - 9 & 10 Cumberland Plain Woodland	*4.6*	*0.0*	*0.0*	*0.0*	*4.6*	*0.0*	*4.4*	*0.0*	*4.4*	*4.5*	*13.5*	*904.2*	*1.5%*	*0.5%*
11 - Alluvial Woodland	2.8	2.7	0.5		6.1	1.9	1.0		2.9		8.9	128.9	6.9%	4.7%
12 - Riparian Forest					0.0				0.0				na	na
Sub-total - 11 & 12 Sydney Coastal River-flat Forest					*6.1*				*2.9*				*na*	*na*
13 - Western Sydney Dry Rainforest					0.0				0.0				na	na
14 - Moist Shale Woodland					0.0				0.0				na	na
15 - Turpentine-Ironbark Forest					0.0		0.0		0.0		0.0	327.7	0.0%	0.0%
43 - Turpentine-Ironbark Margin Forest	12.4				12.4		5.3		5.3		17.7	16.7	105.9%	74.2%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*12.4*	*0.0*	*0.0*	*0.0*	*12.4*	*0.0*	*5.3*	*0.0*	*5.3*	*0.0*	*17.7*	*344.3*	5.1%	3.6%
36 - Freshwater Wetlands*					0.0				0.0				na	na
37 - Elderslie Banksia Scrub Forest					0.0				0.0				na	na
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest					0.0				0.0				na	na
TOTAL	**19.8**	**5.2**	**17.0**	**0.0**	**42.0**	**1.9**	**14.7**	**0.0**	**16.6**	**8.8**	**67.5**	**2,936.3**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of BANKSTOWN LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0		0.3		0.3	4.0	4.3	117.8	3.7%	0.0%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0		0.0		0.0	44.2	44.3	201.4	22.0%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.4*	*0.0*	*0.4*	*48.2*	*48.6*	*319.2*	*15.2%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest	14.9		12.7		27.6		14.7		14.7	74.4	116.8	2,628.9	4.4%	1.1%
4 - Castlereagh Swamp Woodland			0.8		0.8				0.0		0.8	1.0	76.2%	76.2%
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0			0.6	0.0%	0.0%
8 - Agnes Banks Woodland					0.0				0.0				na	n/a
9 - Shale Hills Woodland					0.0				0.0	0.1	0.1	5.9	1.8%	0.0%
10 - Shale Plains Woodland	117.4	2.7			120.1		49.2		49.2	48.9	218.3	2,268.0	9.6%	5.3%
Sub-total - 9 & 10 Cumberland Plain Woodland	*117.4*	*2.7*	*0.0*	*0.0*	*120.1*	*0.0*	*49.2*	*0.0*	*49.2*	*49.0*	*218.4*	*2,273.9*	*9.6%*	*5.3%*
11 - Alluvial Woodland	3.0	2.5	40.2		45.6	0.4	58.6		59.0	16.2	120.8	743.7	16.2%	6.1%
12 - Riparian Forest	36.6		5.2		41.8		14.9		14.9		56.7	92.4	61.4%	45.3%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*39.5*	*2.5*	*45.4*	*0.0*	*87.4*	*0.4*	*73.5*	*0.0*	*73.9*	*16.2*	*177.5*	*836.1*	*21.2%*	*10.5%*
13 - Western Sydney Dry Rainforest					0.0				0.0				na	n/a
14 - Moist Shale Woodland					0.0				0.0				na	n/a
15 - Turpentine-Ironbark Forest	2.9	3.2			6.1		2.1		2.1	32.8	41.0	576.8	7.1%	1.1%
43 - Turpentine-Ironbark Margin Forest	2.0				2.0		7.5		7.5	83.5	93.0	179.5	51.8%	1.1%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest					*8.1*				*9.6*				na	n/a
36 - Freshwater Wetlands*		6.0			6.0				0.0		6.0	74.5	8.1%	8.1%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest	9.8	8.9			18.7	4.7	20.5		25.2	2.4	46.3	29.5	157.0%	63.4%
152 - Blue Gum High Forest					0.0				0.0				na	n/a
TOTAL	**186.6**	**23.3**	**58.9**	**0.0**	**268.7**	**5.2**	**167.8**	**0.0**	**173.0**	**306.5**	**748.3**	**6,920.0**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of BAULKHAM HILLS LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	53.6	6.7			60.3	0.6	35.3	42.1	78.0	15.7	154.0	832.8	18.5%	7.2%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	964.4	37.9			1,002.2	17.9	177.2	360.8	555.9	54.4	1,612.5	2,423.3	66.5%	41.4%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*1,018.0*	*44.6*	*0.0*	*0.0*	*1,062.5*	*18.5*	*212.5*	*402.9*	*633.9*	*70.0*	*1,766.5*	*3,256.1*	*54.3%*	*32.6%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	5.0	7.8			12.8		9.5	11.3	20.8	10.9	44.5	333.5	13.3%	3.8%
10 - Shale Plains Woodland	74.8	27.1			101.9	2.8	113.5	212.1	328.4	23.8	454.0	2,191.6	20.7%	4.6%
Sub-total - 9 & 10 Cumberland Plain Woodland	*79.7*	*34.9*	*0.0*	*0.0*	*114.6*	*2.8*	*123.0*	*223.4*	*349.2*	*34.7*	*498.5*	*2,525.1*	*19.7%*	*4.5%*
11 - Alluvial Woodland	110.5	8.3	65.1		183.8	20.6	84.6	10.9	116.1	0.2	300.1	772.4	38.9%	23.8%
12 - Riparian Forest	0.4				0.4	2.7	2.4		5.0		5.5	50.2	10.9%	0.9%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*110.9*	*8.3*	*65.1*	*0.0*	*184.3*	*23.3*	*87.0*	*10.9*	*121.1*	*0.2*	*305.6*	*822.6*	*37.1%*	*22.4%*
13 - Western Sydney Dry Rainforest	6.7	5.2	0.7		12.5	0.6	3.7		4.3	2.3	19.2	64.7	29.6%	19.4%
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest	59.8	2.5			62.3	3.4	80.4	50.6	134.4	184.9	381.6	2,824.3	13.5%	2.2%
43 - Turpentine-Ironbark Margin Forest	198.5	30.1			228.6	4.7	76.9	228.5	310.1	351.3	890.0	2,744.8	32.4%	8.3%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*258.3*	*32.6*	*0.0*	*0.0*	*290.9*	*8.0*	*157.4*	*279.2*	*444.6*	*536.1*	*1,271.6*	*5,569.1*	22.8%	5.2%
36 - Freshwater Wetlands*		177.1			177.1				0.0		177.1	262.3	67.5%	67.5%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest	34.3	0.8			35.1	0.7	2.2	1.5	4.4	70.4	109.9	318.2	34.5%	11.0%
TOTAL	**1,507.9**	**303.5**	**65.7**	**0.0**	**1,877.1**	**53.9**	**585.7**	**917.8**	**1,557.5**	**713.8**	**4,148.4**	**12,818.0**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of BLACKTOWN LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	9.6	0.1			9.7		0.0	5.1	5.1		14.9	35.5	41.9%	27.3%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	9.6	0.5			10.1		0.6	2.0	2.6		12.7	31.1	40.8%	32.4%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*19.2*	*0.6*	*0.0*	*0.0*	*19.8*	*0.0*	*0.7*	*7.1*	*7.7*	*0.0*	*27.5*	*66.6*	*41.4%*	*29.7%*
3 - Cooks River Castlereagh Ironbark Forest	203.1	21.4	1.0		225.5		22.4	8.8	31.2	102.4	359.1	1,411.9	25.4%	16.0%
4 - Castlereagh Swamp Woodland	20.1	0.1	2.8		23.0	0.3	3.6		3.9		26.9	34.8	77.3%	66.1%
6 - Castlereagh Scribbly Gum Woodland*	17.9	6.6			24.6		7.5	1.5	9.0	3.4	37.0	379.2	9.8%	6.5%
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	262.4	35.8			298.2	12.8	58.3	23.4	94.5	94.2	486.9	1,978.7	24.6%	15.1%
10 - Shale Plains Woodland	1,027.2	298.5	0.7		1,326.4	24.0	705.7	345.2	1,075.0	884.7	3,286.1	15,764.7	20.8%	8.4%
Sub-total - 9 & 10 Cumberland Plain Woodland	*1,289.6*	*334.3*	*0.7*	*0.0*	*1,624.6*	*36.8*	*764.0*	*368.6*	*1,169.5*	*978.9*	*3,772.9*	*17,743.4*	*21.3%*	*9.2%*
11 - Alluvial Woodland	390.6	65.3	87.9		543.8	3.3	336.5	28.5	368.3	26.3	938.5	2,847.2	33.0%	19.1%
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*390.6*	*65.3*	*87.9*	*0.0*	*543.8*	*3.3*	*336.5*	*28.5*	*368.3*	*26.3*	*938.5*	*2,847.2*	*33.0%*	*19.1%*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0				0.0	1.1	1.1	8.7	12.7%	0.0%
43 - Turpentine-Ironbark Margin Forest					0.0		0.0		0.0		0.0		n/a	n/a
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.1*	*1.1*	*8.7*	12.8%	0.0%
36 - Freshwater Wetlands*		18.2			18.2				0.0		18.2	18.2	100.0%	100.0%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest	499.6	35.6			535.3		236.8	140.7	377.5	80.8	993.5	1,430.4	69.5%	37.4%
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**2,440.2**	**482.1**	**92.4**	**0.0**	**3,014.7**	**40.4**	**1,371.6**	**555.2**	**1,967.2**	**1,193.0**	**6,174.9**	**23,940.4**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of BLUE MOUNTAINS LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+ SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				na	na
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	5.7				5.7		1.3		1.3	1.0	7.9	5.7	138.9%	99.9%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*5.7*	*0.0*	*0.0*	*0.0*	*5.7*	*0.0*	*1.3*	*0.0*	*1.3*	*1.0*	*7.9*	*5.7*	*138.9%*	*99.9%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0			5.8	0.0%	0.0%
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*5.8*	*0.0%*	*0.0%*
11 - Alluvial Woodland	13.8				13.8		1.3		1.3		15.1	23.9	63.3%	57.7%
12 - Riparian Forest					0.0		0.7		0.7		0.7	12.2	5.4%	0.0%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*13.8*	*0.0*	*0.0*	*0.0*	*13.8*	*0.0*	*2.0*	*0.0*	*2.0*	*0.0*	*15.8*	*36.1*	*43.7%*	*38.2%*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0				0.0				n/a	n/a
43 - Turpentine-Ironbark Margin Forest					0.0				0.0				n/a	n/a
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	n/a	n/a
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0			0.0	0.0%	0.0%
152 - Blue Gum High Forest					0.0				0.0				na	na
TOTAL	**19.5**	**0.0**	**0.0**	**0.0**	**19.5**	**0.0**	**3.3**	**0.0**	**3.3**	**1.0**	**23.7**	**47.6**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of BURWOOD LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0			8.0	0.0%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*8.0*	*0.0%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0			13.5	0.0%	0.0%
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland					0.0				0.0				na	na
9 - Shale Hills Woodland					0.0				0.0				na	na
10 - Shale Plains Woodland					0.0				0.0				na	na
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland					0.0				0.0				n/a	n/a
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0				0.0			187.9	0.0%	0.0%
43 - Turpentine-Ironbark Margin Forest					0.0				0.0				n/a	n/a
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*187.9*	0.0%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**209.4**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of CAMDEN LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+ SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0		3.0		3.0		3.0	14.3	20.8%	0.0%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0		1.7		1.7		1.7	4.2	39.3%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.6*	*0.0*	*4.6*	*0.0*	*4.6*	*18.5*	*25.1%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	446.3	204.8			651.1	141.4	1,001.5	178.4	1,321.3	62.4	2,034.9	7,560.4	26.9%	8.6%
10 - Shale Plains Woodland	264.6	188.7			453.2	0.6	672.8	233.6	907.0	70.9	1,431.1	6,911.4	20.7%	6.6%
Sub-total - 9 & 10 Cumberland Plain Woodland	*710.9*	*393.5*	*0.0*	*0.0*	*1,104.4*	*141.9*	*1,674.3*	*412.0*	*2,228.3*	*133.3*	*3,466.0*	*14,471.8*	*24.0%*	*7.6%*
11 - Alluvial Woodland	283.6	97.5	137.6		518.7	41.8	331.5	33.6	406.9	17.8	943.5	5,110.1	18.5%	10.2%
12 - Riparian Forest	116.1	4.9	21.9		142.9	21.6	34.4		56.1	0.6	199.6	396.6	50.3%	36.0%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest					*661.6*				*463.0*				*n/a*	*n/a*
13 - Western Sydney Dry Rainforest	1.3	0.7			2.0	10.6	5.3		15.9		17.9	19.1	93.8%	10.5%
14 - Moist Shale Woodland	1.2	2.9			4.1	6.9	28.8		35.6		39.7	89.7	44.3%	4.6%
15 - Turpentine-Ironbark Forest					0.0				0.0				n/a	n/a
43 - Turpentine-Ironbark Margin Forest					0.0				0.0				n/a	n/a
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	n/a	n/a
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest	12.4	0.5	0.5		13.4		1.7		1.7		15.1	Not	n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**1,125.5**	**499.9**	**160.1**	**0.0**	**1,785.5**	**222.9**	**2,080.7**	**445.6**	**2,749.2**	**151.8**	**4,686.5**	**20,105.7**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of CAMPBELLTOWN LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+ SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	188.0	32.9			220.9	1.6	154.2		155.8	301.8	678.5	1,927.1	35.2%	11.5%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	769.2	57.0		1.7	827.9	3.7	268.2	86.6	358.5	313.0	1,499.5	2,756.8	54.4%	30.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*957.2*	*89.9*	*0.0*	*1.7*	*1,048.8*	*5.3*	*422.4*	*86.6*	*514.3*	*614.8*	*2,178.0*	*4,683.9*	*46.5%*	*22.4%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0			108.4	0.0%	0.0%
4 - Castlereagh Swamp Woodland	0.0				0.0				0.0		0.0	1.3	0.7%	0.7%
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0			2.7	0.0%	0.0%
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	215.8	102.5			318.3	58.8	244.5	36.8	340.1	164.1	822.4	4,341.0	18.9%	7.3%
10 - Shale Plains Woodland	177.4	87.6			264.9	4.2	251.5	27.5	283.2	442.5	990.6	4,593.4	21.6%	5.8%
Sub-total - 9 & 10 Cumberland Plain Woodland	*393.2*	*190.0*	*0.0*	*0.0*	*583.2*	*63.0*	*496.0*	*64.3*	*623.3*	*606.5*	*1,813.0*	*8,934.4*	*20.3%*	*6.5%*
11 - Alluvial Woodland	92.1	18.6	22.1		132.9	3.7	66.2	1.3	71.1	11.9	215.9	1,172.3	18.4%	11.3%
12 - Riparian Forest	81.4		3.8		85.2		5.5		5.5		90.7	100.8	90.0%	84.5%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*173.5*	*18.6*	*25.9*	*0.0*	*218.1*	*3.7*	*71.7*	*1.3*	*76.6*	*11.9*	*306.7*	*1,273.2*	*24.1%*	*17.1%*
13 - Western Sydney Dry Rainforest	1.0	0.5			1.6	2.0	0.9		3.0		4.5	5.1	89.3%	30.7%
14 - Moist Shale Woodland	6.8	5.2			12.0	31.8	16.3		48.1	1.2	61.3	165.4	37.1%	7.2%
15 - Turpentine-Ironbark Forest					0.0				0.0				n/a	n/a
43 - Turpentine-Ironbark Margin Forest					0.0				0.0	0.9	0.9	12.6	6.8%	0.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*0.9*	*12.6*	6.8%	0.0%
36 - Freshwater Wetlands*					0.0				0.0			437.9	0.0%	0.0%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**1,531.8**	**304.2**	**25.9**	**1.7**	**1,863.7**	**105.7**	**1,007.3**	**152.2**	**1,265.3**	**1,235.4**	**4,364.3**	**15,624.7**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of CANADA BAY LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+ SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				na	na
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0			92.5	0.0%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*92.5*	*0.0%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0			0.7	0.0%	0.0%
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0				n/a	n/a
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland			1.0		1.0				0.0		1.0	1.0	100.2%	100.2%
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*1.0*	*0.0*	*1.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.0*	*1.0*	*100.2%*	*100.2%*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest	1.8				1.8		6.3		6.3		8.1	664.0	1.2%	0.3%
43 - Turpentine-Ironbark Margin Forest	0.4				0.4		3.1		3.1		3.5	244.5	1.4%	0.2%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*2.1*	*0.0*	*0.0*	*0.0*	*2.1*	*0.0*	*9.4*	*0.0*	*9.4*	*0.0*	*11.5*	*908.5*	1.3%	0.2%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**2.1**	**0.0**	**1.0**	**0.0**	**3.2**	**0.0**	**9.4**	**0.0**	**9.4**	**0.0**	**12.6**	**1,002.7**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of CANTERBURY LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	1.4	0.9			2.3		2.8		2.8		5.1	125.8	4.0%	1.9%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*1.4*	*0.9*	*0.0*	*0.0*	*2.3*	*0.0*	*2.8*	*0.0*	*2.8*	*0.0*	*5.1*	*125.8*	*4.0%*	*1.9%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0			262.4	0.0%	0.0%
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0			36.8	0.0%	0.0%
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*36.8*	*0.0%*	*0.0%*
11 - Alluvial Woodland					0.0				0.0			26.1	0.0%	0.0%
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*26.1*	*0.0%*	*0.0%*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest	0.8	1.9			2.7		7.0		7.0	3.3	13.0	1,351.7	1.0%	0.2%
43 - Turpentine-Ironbark Margin Forest					0.0		1.3		1.3		1.3	86.2	1.6%	0.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.8*	*1.9*	*0.0*	*0.0*	*2.7*	*0.0*	*8.4*	*0.0*	*8.4*	*3.3*	*14.4*	*1,437.9*	1.0%	0.2%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**2.1**	**2.8**	**0.0**	**0.0**	**5.0**	**0.0**	**11.1**	**0.0**	**11.1**	**3.3**	**19.4**	**1,888.9**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of FAIRFIELD LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0				n/a	n/a
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
3 - Cooks River Castlereagh Ironbark Forest					0.0		15.9		15.9	64.6	80.5	2,057.7	3.9%	0.0%
4 - Castlereagh Swamp Woodland	1.4				1.4		2.2		2.2	4.8	8.5	45.2	18.8%	3.2%
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	197.9	19.4			217.3	5.1	94.7	41.8	141.7	4.0	362.9	2,046.8	17.7%	10.6%
10 - Shale Plains Woodland	124.3	37.1			161.3	0.0	147.0	47.1	194.1	166.4	521.8	4,518.7	11.5%	3.6%
Sub-total - 9 & 10 Cumberland Plain Woodland	*322.1*	*56.5*	*0.0*	*0.0*	*378.6*	*5.2*	*241.6*	*88.9*	*335.7*	*170.4*	*884.7*	*6,565.4*	*13.5%*	*5.8%*
11 - Alluvial Woodland	134.9	16.2	47.1		198.2	9.8	125.5	6.6	141.9	38.6	378.6	1,251.8	30.2%	15.8%
12 - Riparian Forest			0.7		0.7		18.3	3.3	21.6	3.0	25.3	146.9	17.2%	0.5%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*134.9*	*16.2*	*47.8*	*0.0*	*198.9*	*9.8*	*143.9*	*9.8*	*163.5*	*41.6*	*404.0*	*1,398.7*	*28.9%*	*14.2%*
13 - Western Sydney Dry Rainforest	0.7				0.7				0.0		0.7	1.0	76.0%	76.0%
14 - Moist Shale Woodland	13.3				13.3				0.0		13.3	18.8	70.6%	70.6%
15 - Turpentine-Ironbark Forest					0.0		1.7		1.7		1.7	17.5	9.9%	0.0%
43 - Turpentine-Ironbark Margin Forest					0.0				0.0				n/a	n/a
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.7*	*0.0*	*1.7*	*0.0*	*1.7*	*17.5*	9.9%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest	6.5	0.5			7.1				0.0		7.1	7.1	n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**478.9**	**73.2**	**47.8**	**0.0**	**600.0**	**14.9**	**405.3**	**98.8**	**519.0**	**281.4**	**1,400.4**	**10,111.3**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of HAWKESBURY LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	155.1	57.8	1.1		214.0	24.5	179.7	73.4	277.5	15.0	506.5	1,693.4	29.9%	12.6%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	1,412.8	237.0	0.3		1,650.1	68.5	1,013.5	552.4	1,634.3	74.8	3,359.2	6,873.6	48.9%	24.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*1,567.8*	*294.9*	*1.4*	*0.0*	*1,864.1*	*92.9*	*1,193.3*	*625.7*	*1,911.9*	*89.8*	*3,865.8*	*8,567.0*	*45.1%*	*21.8%*
3 - Cooks River Castlereagh Ironbark Forest	120.9	9.7			130.6			6.3	6.3	5.9	142.8	142.9	100.0%	91.4%
4 - Castlereagh Swamp Woodland	38.6	4.1			42.7		0.7		0.7	1.2	44.6	71.5	62.4%	59.7%
6 - Castlereagh Scribbly Gum Woodland*	116.5				116.5		12.1	1.5	13.6	36.7	166.8	228.3	73.0%	51.0%
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	1.6	4.3			5.9	0.3	2.3	0.5	3.1	2.0	10.9	59.1	18.5%	9.9%
10 - Shale Plains Woodland	1,379.6	152.0	0.1		1,531.7	20.4	870.2	952.7	1,843.3	163.9	3,538.9	8,783.7	40.3%	17.4%
Sub-total - 9 & 10 Cumberland Plain Woodland	*1,381.3*	*156.3*	*0.1*	*0.0*	*1,537.6*	*20.7*	*872.5*	*953.1*	*1,846.4*	*165.9*	*3,549.9*	*8,842.8*	*40.1%*	*17.4%*
11 - Alluvial Woodland	381.1	39.5	95.9		516.5	178.8	288.2	45.3	512.2	13.5	1,042.3	6,716.4	15.5%	7.7%
12 - Riparian Forest	15.5		29.4		44.9	100.2	21.8	0.0	122.0	5.0	171.9	729.2	23.6%	6.2%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*396.6*	*39.5*	*125.3*	*0.0*	*561.4*	*279.0*	*310.0*	*45.3*	*634.3*	*18.5*	*1,214.2*	*7,445.6*	*16.3%*	*7.5%*
13 - Western Sydney Dry Rainforest	17.6	4.6	0.4		22.7	0.8	27.4	3.2	31.4	1.5	55.6	181.2	30.7%	12.5%
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest	48.0		0.3		48.3	82.7	84.7	51.6	219.1	25.1	292.4	934.8	31.3%	5.2%
43 - Turpentine-Ironbark Margin Forest	94.7	2.7			97.5	39.2	70.8	44.0	154.0	29.1	280.6	546.1	51.4%	17.8%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*142.7*	*2.7*	*0.3*	*0.0*	*145.7*	*121.9*	*155.6*	*95.6*	*373.1*	*54.2*	*573.0*	*1,480.8*	38.7%	9.8%
36 - Freshwater Wetlands*	2.2	420.7			423.0				0.0		423.0	644.9	65.6%	65.6%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest	332.1	56.3			388.4		97.9	108.9	206.8	165.0	760.2	1,614.0	47.1%	24.1%
152 - Blue Gum High Forest					0.0	1.7	1.3		3.0		3.0	38.4	7.9%	0.0%
TOTAL	**4,116.4**	**988.8**	**127.5**	**0.0**	**5,232.6**	**517.0**	**2,670.8**	**1,839.7**	**5,027.4**	**538.8**	**10,798.8**	**29,257.5**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of HOLROYD LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+ SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0		0.0		0.0		0.0	27.8	0.0%	0.0%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0	0.7	0.0		0.7		0.7	20.1	3.5%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*0.0*	*0.0*	*0.7*	*0.0*	*0.7*	*47.9*	*1.5%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest			1.6		1.6	0.9	1.0		1.9	13.2	16.7	394.2	4.2%	0.4%
4 - Castlereagh Swamp Woodland	0.1		0.0		0.1		0.5		0.5		0.7	23.4	2.8%	0.6%
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	9.6	1.0			10.7	13.2	6.8		20.0	6.5	37.1	149.9	24.8%	7.1%
10 - Shale Plains Woodland	13.1	2.9			16.0	5.3	66.9		72.2	119.4	207.6	2,844.7	7.3%	0.6%
Sub-total - 9 & 10 Cumberland Plain Woodland	*22.7*	*3.9*	*0.0*	*0.0*	*26.7*	*18.5*	*73.6*	*0.0*	*92.1*	*125.9*	*244.7*	*2,994.6*	*8.2%*	*0.9%*
11 - Alluvial Woodland	9.9	1.9	17.4		29.2	3.6	14.8		18.4	10.1	57.7	316.8	18.2%	9.2%
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*9.9*	*1.9*	*17.4*	*0.0*	*29.2*	*3.6*	*14.8*	*0.0*	*18.4*	*10.1*	*57.7*	*316.8*	*18.2%*	*9.2%*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0			0.0	0.0%	0.0%
15 - Turpentine-Ironbark Forest					0.0				0.0				n/a	n/a
43 - Turpentine-Ironbark Margin Forest					0.0				0.0			2.8	0.0%	0.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.8*	0.0%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest		1.0			1.0				0.0		1.0	1.0	100.0%	100.0%
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**32.8**	**6.8**	**19.0**	**0.0**	**58.6**	**23.7**	**90.0**	**0.0**	**113.7**	**149.2**	**321.5**	**3,780.9**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of HORNSBY LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+ SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				na	na
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	25.1				25.1			33.7	33.7	3.0	61.8	82.7	74.7%	30.3%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*25.1*	*0.0*	*0.0*	*0.0*	*25.1*	*0.0*	*0.0*	*33.7*	*33.7*	*3.0*	*61.8*	*82.7*	*74.7%*	*30.3%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0				n/a	n/a
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland					0.0				0.0				n/a	n/a
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
13 - Western Sydney Dry Rainforest	0.7				0.7				0.0		0.7	26.5	2.8%	2.8%
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest	40.3	2.9			43.1	1.3	3.6	50.2	55.1	144.1	242.3	1,994.6	12.1%	2.2%
43 - Turpentine-Ironbark Margin Forest	331.2	51.9			383.1	6.7	58.6	465.7	531.0	547.8	1,461.8	2,556.6	57.2%	15.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*371.5*	*54.8*	*0.0*	*0.0*	*426.2*	*8.0*	*62.2*	*515.9*	*586.0*	*691.9*	*1,704.2*	*4,551.2*	37.4%	9.4%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest	31.0	3.7			34.6	2.5	3.0	3.6	9.2	589.8	633.6	1,595.4	39.7%	2.2%
TOTAL	**428.2**	**58.5**	**0.0**	**0.0**	**486.7**	**10.5**	**65.2**	**553.2**	**628.9**	**1,284.7**	**2,400.3**	**6,255.9**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of HUNTERS HILL LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0				n/a	n/a
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0				n/a	n/a
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland					0.0				0.0				n/a	n/a
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0		1.8		1.8		1.8	9.2	19.8%	0.0%
43 - Turpentine-Ironbark Margin Forest					0.0		1.5		1.5	12.1	13.5	149.6	9.0%	0.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.3*	*0.0*	*3.3*	*12.1*	*15.4*	*158.8*	9.7%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.3**	**0.0**	**3.3**	**12.1**	**15.4**	**158.8**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of HURSTVILLE LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+ SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0	0.1	0.1	84.0	0.1%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*84.0*	*0.1%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest					0.0		3.0		3.0	3.9	6.9	339.3	2.0%	0.0%
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0		3.0		3.0	8.0	11.0	119.6	9.2%	0.0%
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*3.0*	*0.0*	*3.0*	*8.0*	*11.0*	*119.6*	*9.2%*	*0.0%*
11 - Alluvial Woodland			1.2		1.2		1.2		1.2		2.4	40.4	6.0%	3.0%
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*1.2*	*0.0*	*1.2*	*0.0*	*1.2*	*0.0*	*1.2*	*0.0*	*2.4*	*40.4*	*6.0%*	*3.0%*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0		0.1		0.1	6.2	6.3	692.4	0.9%	0.0%
43 - Turpentine-Ironbark Margin Forest		0.4			0.4		0.6		0.6	68.1	69.0	160.5	43.0%	0.2%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.4*	*0.0*	*0.0*	*0.4*	*0.0*	*0.7*	*0.0*	*0.7*	*74.3*	*75.4*	*853.0*	8.8%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**0.0**	**0.4**	**1.2**	**0.0**	**1.6**	**0.0**	**8.0**	**0.0**	**8.0**	**86.2**	**95.8**	**1,436.2**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of KOGARAH LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+ SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0			104.9	0.0%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*104.9*	*0.0%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland				1.9	1.9				0.0		1.9	58.2	3.3%	3.3%
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0				n/a	n/a
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland					0.0				0.0				n/a	n/a
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0		0.7		0.7		0.7	29.9	2.2%	0.0%
43 - Turpentine-Ironbark Margin Forest	0.8			1.4	2.2				0.0	11.7	13.9	467.2	3.0%	0.5%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.8*	*0.0*	*0.0*	*1.4*	*2.2*	*0.0*	*0.7*	*0.0*	*0.7*	*11.7*	*14.6*	*497.2*	2.9%	0.4%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**0.8**	**0.0**	**0.0**	**3.4**	**4.2**	**0.0**	**0.7**	**0.0**	**0.7**	**11.7**	**16.5**	**660.2**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of KU-RING-GAI LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0				n/a	n/a
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0				n/a	n/a
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland					0.0				0.0				n/a	n/a
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
13 - Western Sydney Dry Rainforest	1.9				1.9				0.0	2.4	4.4	32.8	13.3%	5.9%
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest	8.9	0.0			8.9		0.5		0.5	14.3	23.7	200.1	11.8%	4.5%
43 - Turpentine-Ironbark Margin Forest	55.9	3.9			59.9	1.0	7.9		8.9	729.4	798.2	1,046.2	76.3%	5.7%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*64.8*	*4.0*	*0.0*	*0.0*	*68.8*	*1.0*	*8.4*	*0.0*	*9.4*	*743.7*	*821.9*	*1,246.3*	65.9%	5.5%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest	84.3	12.3			96.6		6.7		6.7	524.0	627.4	1,709.2	36.7%	5.7%
TOTAL	**151.1**	**16.2**	**0.0**	**0.0**	**167.3**	**1.0**	**15.1**	**0.0**	**16.1**	**1,270.1**	**1,453.6**	**2,988.3**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of LANE COVE LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0				n/a	n/a
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0				n/a	n/a
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland					0.0				0.0				n/a	n/a
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0				0.0	25.4	25.4	78.7	32.3%	0.0%
43 - Turpentine-Ironbark Margin Forest		1.0			1.0	0.1	0.7		0.8	79.3	81.2	320.5	25.3%	0.3%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*1.0*	*0.0*	*0.0*	*1.0*	*0.1*	*0.7*	*0.0*	*0.8*	*104.7*	*106.6*	*399.2*	26.7%	0.3%
36 - Freshwater Wetlands*		0.0			0.0				0.0		0.0	0.0	97.5%	97.5%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0			0.4	0.0%	0.0%
TOTAL	**0.0**	**1.1**	**0.0**	**0.0**	**1.1**	**0.1**	**0.7**	**0.0**	**0.8**	**104.7**	**106.6**	**399.7**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of LIVERPOOL LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	49.8	15.4			65.3	4.2	64.0	4.1	72.3	0.1	137.6	334.0	41.2%	19.5%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	379.9	10.6		24.9	415.4	1.0	39.4	7.8	48.2	15.9	479.6	812.7	59.0%	51.1%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*429.8*	*26.1*	*0.0*	*24.9*	*480.7*	*5.2*	*103.4*	*11.9*	*120.5*	*16.0*	*617.2*	*1,146.7*	*53.8%*	*41.9%*
3 - Cooks River Castlereagh Ironbark Forest	91.9	1.9	10.8		104.6		54.7		54.7	52.8	212.1	1,203.8	17.6%	8.7%
4 - Castlereagh Swamp Woodland	59.0		32.7		91.7		10.9	0.2	11.1	7.8	110.6	271.2	40.8%	33.8%
6 - Castlereagh Scribbly Gum Woodland*	259.0	17.6	7.2		283.7		4.3	1.7	6.1	8.5	298.3	367.7	81.1%	77.2%
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	368.6	217.9			586.5	21.8	682.4	126.5	830.8	6.9	1,424.1	5,215.9	27.3%	11.2%
10 - Shale Plains Woodland	699.6	312.1			1,011.7	13.0	942.1	416.9	1,372.0	245.5	2,629.1	12,884.0	20.4%	7.9%
Sub-total - 9 & 10 Cumberland Plain Woodland	*1,068.1*	*530.0*	*0.0*	*0.0*	*1,598.1*	*34.9*	*1,624.5*	*543.4*	*2,202.8*	*252.3*	*4,053.2*	*18,099.9*	*22.4%*	*8.8%*
11 - Alluvial Woodland	567.9	102.3	197.4		867.6	25.5	383.8	62.6	471.8	27.3	1,366.8	3,376.0	40.5%	25.7%
12 - Riparian Forest	99.0	0.2	9.8		109.0	29.4	47.8		77.2	7.7	193.9	709.5	27.3%	15.4%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*666.9*	*102.6*	*207.2*	*0.0*	*976.7*	*54.9*	*431.6*	*62.6*	*549.0*	*35.0*	*1,560.6*	*4,085.5*	*38.2%*	*23.9%*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland	0.4	4.3			4.7		18.7		18.7		23.4	56.1	41.7%	8.4%
15 - Turpentine-Ironbark Forest					0.0				0.0				n/a	n/a
43 - Turpentine-Ironbark Margin Forest					0.0				0.0				n/a	n/a
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	n/a	n/a
36 - Freshwater Wetlands*	2.3	15.5			17.7				0.0		17.7	92.5	19.2%	19.2%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest	395.1	23.9		48.6	467.6	6.1	64.2	6.8	77.0	46.4	591.0	767.7	77.0%	60.9%
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**2,972.4**	**721.8**	**257.8**	**73.4**	**4,025.5**	**101.0**	**2,312.4**	**626.5**	**3,039.9**	**418.8**	**7,484.1**	**26,091.1**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of MOSMAN LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0				n/a	n/a
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0				n/a	n/a
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland					0.0				0.0				n/a	n/a
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0				0.0				n/a	n/a
43 - Turpentine-Ironbark Margin Forest					0.0				0.0			0.6	0.0%	0.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest					*0.0*				*0.0*				n/a	n/a
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.6**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of NORTH SYDNEY LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				n/a	n/a
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0				n/a	n/a
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				n/a	n/a
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland					0.0				0.0				n/a	n/a
10 - Shale Plains Woodland					0.0				0.0				n/a	n/a
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
11 - Alluvial Woodland					0.0				0.0				n/a	n/a
12 - Riparian Forest					0.0				0.0				n/a	n/a
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*n/a*	*n/a*
13 - Western Sydney Dry Rainforest					0.0				0.0				n/a	n/a
14 - Moist Shale Woodland					0.0				0.0				n/a	n/a
15 - Turpentine-Ironbark Forest					0.0				0.0			85.7	n/a	n/a
43 - Turpentine-Ironbark Margin Forest					0.0	0.5	1.3		1.8	3.7	5.5	292.3	1.9%	0.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*1.3*	*0.0*	*1.8*	*3.7*	*5.5*	*378.0*	1.4%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				n/a	n/a
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				n/a	n/a
152 - Blue Gum High Forest					0.0				0.0				n/a	n/a
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.5**	**1.3**	**0.0**	**1.8**	**3.7**	**5.5**	**378.0**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of PARRAMATTA LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	7.4	2.4			9.8		2.8		2.8	0.4	12.9	153.3	8.4%	6.4%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	8.2	0.1			8.3	23.3	26.0		49.3	4.0	61.7	846.9	7.3%	1.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*15.6*	*2.5*	*0.0*	*0.0*	*18.1*	*23.3*	*28.8*	*0.0*	*52.1*	*4.4*	*74.5*	*1,000.3*	*7.5%*	*1.8%*
3 - Cooks River Castlereagh Ironbark Forest	11.8		2.4		14.2		2.2		2.2	1.0	17.4	519.9	3.4%	2.7%
4 - Castlereagh Swamp Woodland					0.0				0.0				n/a	n/a
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				n/a	n/a
8 - Agnes Banks Woodland					0.0				0.0				n/a	n/a
9 - Shale Hills Woodland	1.4				1.4		0.9		0.9	2.7	5.0	51.3	9.7%	2.7%
10 - Shale Plains Woodland	13.5	5.5			19.0	1.3	28.4		29.7	40.7	89.4	1,788.9	5.0%	1.1%
Sub-total - 9 & 10 Cumberland Plain Woodland	*14.9*	*5.5*	*0.0*	*0.0*	*20.4*	*1.3*	*29.3*	*0.0*	*30.6*	*43.4*	*94.4*	*1,840.2*	*5.1%*	*1.1%*
11 - Alluvial Woodland	3.8	4.9	1.4		10.1	7.2	31.8		39.0	3.3	52.4	196.5	26.6%	5.1%
12 - Riparian Forest					0.0				0.0				na	na
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*3.8*	*4.9*	*1.4*	*0.0*	*10.1*	*7.2*	*31.8*	*0.0*	*39.0*	*3.3*	*52.4*	*196.5*	*26.6%*	*5.1%*
13 - Western Sydney Dry Rainforest	0.7		0.0		0.8				0.0	1.9	2.6	19.7	13.4%	3.9%
14 - Moist Shale Woodland					0.0				0.0			8.8	0.0%	0.0%
15 - Turpentine-Ironbark Forest	26.5	1.7			28.2	6.7	15.3		22.0	31.0	81.2	1,022.1	7.9%	2.8%
43 - Turpentine-Ironbark Margin Forest	49.6	0.1			49.7	5.2	7.3		12.5	41.3	103.5	913.4	11.3%	5.4%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*76.1*	*1.8*	*0.0*	*0.0*	*77.9*	*11.9*	*22.6*	*0.0*	*34.6*	*72.3*	*184.7*	*1,935.5*	9.5%	4.0%
36 - Freshwater Wetlands*					0.0				0.0				na	na
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest					0.0				0.0			11.0	0.0%	0.0%
TOTAL	**122.9**	**14.7**	**3.8**	**0.0**	**141.4**	**43.8**	**114.7**	**0.0**	**158.5**	**126.2**	**426.1**	**5,531.8**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of PENRITH LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	74.4	9.7			84.1	15.2	55.0	5.8	76.0	1.4	161.6	438.9	36.8%	19.2%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	162.6	24.7			187.3	3.4	207.9	66.2	277.4	4.1	468.9	596.8	78.6%	31.4%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*237.0*	*34.4*	*0.0*	*0.0*	*271.4*	*18.6*	*262.9*	*72.0*	*353.5*	*5.5*	*630.4*	*1,035.7*	*60.9%*	*26.2%*
3 - Cooks River Castlereagh Ironbark Forest	455.2	29.0	2.5		486.7		82.3	189.6	271.9	18.7	777.3	1,413.4	55.0%	34.4%
4 - Castlereagh Swamp Woodland	455.5	0.8			456.3		13.3	9.7	23.1		479.4	557.6	86.0%	81.8%
6 - Castlereagh Scribbly Gum Woodland*	2,522.9	91.0	44.8		2,658.6	0.9	254.8	760.6	1,016.3	5.2	3,680.1	4,873.8	75.5%	54.5%
8 - Agnes Banks Woodland	89.8				89.8		79.1	6.7	85.8		175.6	470.5	37.3%	19.1%
9 - Shale Hills Woodland	318.0	63.2			381.2	2.1	318.3	68.8	389.2	7.8	778.2	2,854.1	27.3%	13.4%
10 - Shale Plains Woodland	1,222.0	301.6	1.4		1,525.0	16.0	1,260.2	286.6	1,562.8	595.8	3,683.6	17,949.1	20.5%	8.5%
Sub-total - 9 & 10 Cumberland Plain Woodland	*1,540.0*	*364.8*	*1.4*	*0.0*	*1,906.2*	*18.2*	*1,578.5*	*355.3*	*1,952.0*	*603.6*	*4,461.7*	*20,803.2*	*21.4%*	*9.2%*
11 - Alluvial Woodland	826.8	50.4	219.9		1,097.0	34.0	535.5	49.6	619.2	97.7	1,813.9	7,255.0	25.0%	15.1%
12 - Riparian Forest	25.8	3.3	20.0		49.1	3.3	32.8		36.1		85.2	215.6	39.5%	22.8%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*852.5*	*53.7*	*239.8*	*0.0*	*1,146.1*	*37.4*	*568.3*	*49.6*	*655.3*	*97.7*	*1,899.1*	*7,470.6*	*25.4%*	*15.3%*
13 - Western Sydney Dry Rainforest					0.0				0.0				na	na
14 - Moist Shale Woodland	11.8	0.5			12.2		1.8		1.8		14.1	20.0	70.3%	61.2%
15 - Turpentine-Ironbark Forest	3.8				3.8	9.9	2.2		12.1		15.9	58.2	27.4%	6.6%
43 - Turpentine-Ironbark Margin Forest	12.4	0.1			12.6		15.6	1.6	17.2		29.8	74.3	40.1%	16.9%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*16.3*	*0.1*	*0.0*	*0.0*	*16.4*	*9.9*	*17.9*	*1.6*	*29.3*	*0.0*	*45.7*	*132.5*	34.5%	12.4%
36 - Freshwater Wetlands*		15.7			15.7				0.0		15.7	15.7	100.0%	100.0%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest	264.2	39.0			303.2	3.7	168.2	382.9	554.7	40.9	898.8	1,577.6	57.0%	19.2%
152 - Blue Gum High Forest					0.0				0.0			1.9	0.0%	0.0%
TOTAL	**6,445.1**	**628.9**	**288.6**	**0.0**	**7,362.6**	**88.5**	**3,027.0**	**1,828.0**	**4,943.5**	**771.7**	**13,077.8**	**38,372.6**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of ROCKDALE LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				na	na
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0				na	na
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0			2.9	0.0%	0.0%
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland				6.1	6.1				0.0		6.1	86.5	7.0%	7.0%
9 - Shale Hills Woodland					0.0				0.0				na	na
10 - Shale Plains Woodland					0.0				0.0				na	na
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
11 - Alluvial Woodland					0.0				0.0			0.2	0.0%	0.0%
12 - Riparian Forest					0.0				0.0				na	na
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.2*	*0.0%*	*0.0%*
13 - Western Sydney Dry Rainforest					0.0				0.0				na	na
14 - Moist Shale Woodland					0.0				0.0				na	na
15 - Turpentine-Ironbark Forest					0.0				0.0			195.5	0.0%	0.0%
43 - Turpentine-Ironbark Margin Forest					0.0	2.4	0.9		3.3	0.1	3.3	227.5	1.5%	0.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.4*	*0.9*	*0.0*	*3.3*	*0.1*	*3.3*	*423.0*	0.8%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				na	na
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest					0.0				0.0				na	na
TOTAL	**0.0**	**0.0**	**0.0**	**6.1**	**6.1**	**2.4**	**0.9**	**0.0**	**3.3**	**0.1**	**9.4**	**512.5**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of RYDE LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				na	na
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0			7.2	0.0%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest					*0.0*				*0.0*				*na*	*na*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				na	na
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland					0.0				0.0				na	na
9 - Shale Hills Woodland					0.0				0.0				na	na
10 - Shale Plains Woodland					0.0				0.0				na	na
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
11 - Alluvial Woodland					0.0		0.9		0.9		0.9		na	na
12 - Riparian Forest					0.0				0.0				na	na
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*0.0*	*0.9*	*0.0*	*0.9*	*0.0*	*na*	*na*
13 - Western Sydney Dry Rainforest	0.3		2.6		2.9				0.0	2.1	5.0	31.6	15.8%	9.1%
14 - Moist Shale Woodland					0.0				0.0				na	na
15 - Turpentine-Ironbark Forest	26.7				26.7	4.6	8.5		13.1	76.5	116.3	1,555.8	7.5%	1.7%
43 - Turpentine-Ironbark Margin Forest	18.7				18.7	0.8	13.5		14.3	33.1	66.0	1,258.5	5.2%	1.5%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*45.4*	*0.0*	*0.0*	*0.0*	*45.4*	*5.4*	*22.1*	*0.0*	*27.4*	*109.5*	*182.3*	*2,814.3*	6.5%	1.6%
36 - Freshwater Wetlands*		0.9			0.9				0.0		0.9	0.9	99.9%	99.9%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest					0.0				0.0				na	na
TOTAL	**45.6**	**0.9**	**2.6**	**0.0**	**49.1**	**5.4**	**23.0**	**0.0**	**28.3**	**111.7**	**189.1**	**2,854.0**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of STRATHFIELD LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				na	na
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0			15.6	0.0%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*15.6*	*0.0%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest	0.2		1.5		1.7		1.9		1.9	1.5	5.1	204.1	2.5%	0.8%
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland					0.0				0.0				na	na
9 - Shale Hills Woodland					0.0				0.0				na	na
10 - Shale Plains Woodland					0.0				0.0			56.1	0.0%	0.0%
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*56.1*	*0.0%*	*0.0%*
11 - Alluvial Woodland			0.7		0.7				0.0		0.7	6.7	10.7%	10.7%
12 - Riparian Forest					0.0				0.0				na	na
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.7*	*0.0*	*0.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*	*6.7*	*10.7%*	*10.7%*
13 - Western Sydney Dry Rainforest					0.0				0.0				na	na
14 - Moist Shale Woodland					0.0				0.0				na	na
15 - Turpentine-Ironbark Forest					0.0		0.5		0.5		0.5	1,105.6	0.0%	0.0%
43 - Turpentine-Ironbark Margin Forest					0.0				0.0				na	na
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*	*0.0*	*0.5*	*0.0*	*0.5*	*1,105.6*	0.0%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				na	na
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest					0.0				0.0				na	na
TOTAL	**0.2**	**0.0**	**2.2**	**0.0**	**2.4**	**0.0**	**2.4**	**0.0**	**2.4**	**1.5**	**6.3**	**1,388.1**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of SUTHERLAND LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0			12.8	0.0%	0.0%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0	20.3	20.3	159.1	12.8%	0.0%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*20.3*	*20.3*	*171.9*	*11.8%*	*0.0%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				na	na
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland					0.0				0.0				na	na
9 - Shale Hills Woodland					0.0				0.0				na	na
10 - Shale Plains Woodland					0.0				0.0				na	na
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
11 - Alluvial Woodland			0.9		0.9				0.0		0.9	5.6	15.2%	15.2%
12 - Riparian Forest					0.0				0.0				na	na
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.9*	*0.0*	*0.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.9*	*5.6*	*15.2%*	*15.2%*
13 - Western Sydney Dry Rainforest					0.0				0.0				na	na
14 - Moist Shale Woodland					0.0				0.0				na	na
15 - Turpentine-Ironbark Forest					0.0				0.0				na	na
43 - Turpentine-Ironbark Margin Forest				50.7	50.7				0.0		50.7	65.9	76.9%	76.9%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*50.7*	*50.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*50.7*	*65.9*	76.9%	76.9%
36 - Freshwater Wetlands*	1.4	4.2			5.6		2.1		2.1		7.7	5.6	137.0%	100.0%
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest				1.5	1.5				0.0		1.5	1.5	99.9%	99.9%
TOTAL	**1.4**	**4.2**	**0.9**	**52.1**	**58.6**	**0.0**	**2.1**	**0.0**	**2.1**	**20.3**	**81.0**	**250.5**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of WILLOUGHBY LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				na	na
2 - Shale Sandstone Transition Forest (High Sandstone Influence)					0.0				0.0				na	na
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				na	na
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland					0.0				0.0				na	na
9 - Shale Hills Woodland					0.0				0.0				na	na
10 - Shale Plains Woodland					0.0				0.0				na	na
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
11 - Alluvial Woodland					0.0				0.0				na	na
12 - Riparian Forest					0.0				0.0				na	na
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
13 - Western Sydney Dry Rainforest					0.0				0.0				na	na
14 - Moist Shale Woodland					0.0				0.0				na	na
15 - Turpentine-Ironbark Forest					0.0				0.0	8.0	8.0	526.5	1.5%	0.0%
43 - Turpentine-Ironbark Margin Forest					0.0	1.6	0.6		2.2	55.6	57.8	476.3	12.1%	0.0%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.6*	*0.6*	*0.0*	*2.2*	*63.6*	*65.8*	*1,002.7*	6.6%	0.0%
36 - Freshwater Wetlands*					0.0				0.0				na	na
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest					0.0				0.0	0.1	0.1	22.7	0.3%	0.0%
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.6**	**0.6**	**0.0**	**2.2**	**63.6**	**65.8**	**1,025.5**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of WINGECARRIBEE LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)					0.0				0.0				na	na
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	0.6				0.6		0.4		0.4	3.6	4.7	39.7	11.8%	1.6%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*0.6*	*0.0*	*0.0*	*0.0*	*0.6*	*0.0*	*0.4*	*0.0*	*0.4*	*3.6*	*4.7*	*39.7*	*11.8%*	*1.6%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				na	na
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland					0.0				0.0				na	na
9 - Shale Hills Woodland					0.0				0.0				na	na
10 - Shale Plains Woodland					0.0				0.0				na	na
Sub-total - 9 & 10 Cumberland Plain Woodland	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
11 - Alluvial Woodland					0.0				0.0				na	na
12 - Riparian Forest					0.0				0.0				na	na
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*na*	*na*
13 - Western Sydney Dry Rainforest					0.0				0.0				na	na
14 - Moist Shale Woodland					0.0				0.0				na	na
15 - Turpentine-Ironbark Forest					0.0				0.0				na	na
43 - Turpentine-Ironbark Margin Forest					0.0				0.0				na	na
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	na	na
36 - Freshwater Wetlands*					0.0				0.0				na	na
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest					0.0				0.0				na	na
TOTAL	**0.6**	**0.0**	**0.0**	**0.0**	**0.6**	**0.0**	**0.4**	**0.0**	**0.4**	**3.6**	**4.7**	**39.7**	**2.3%**	**1.4%**

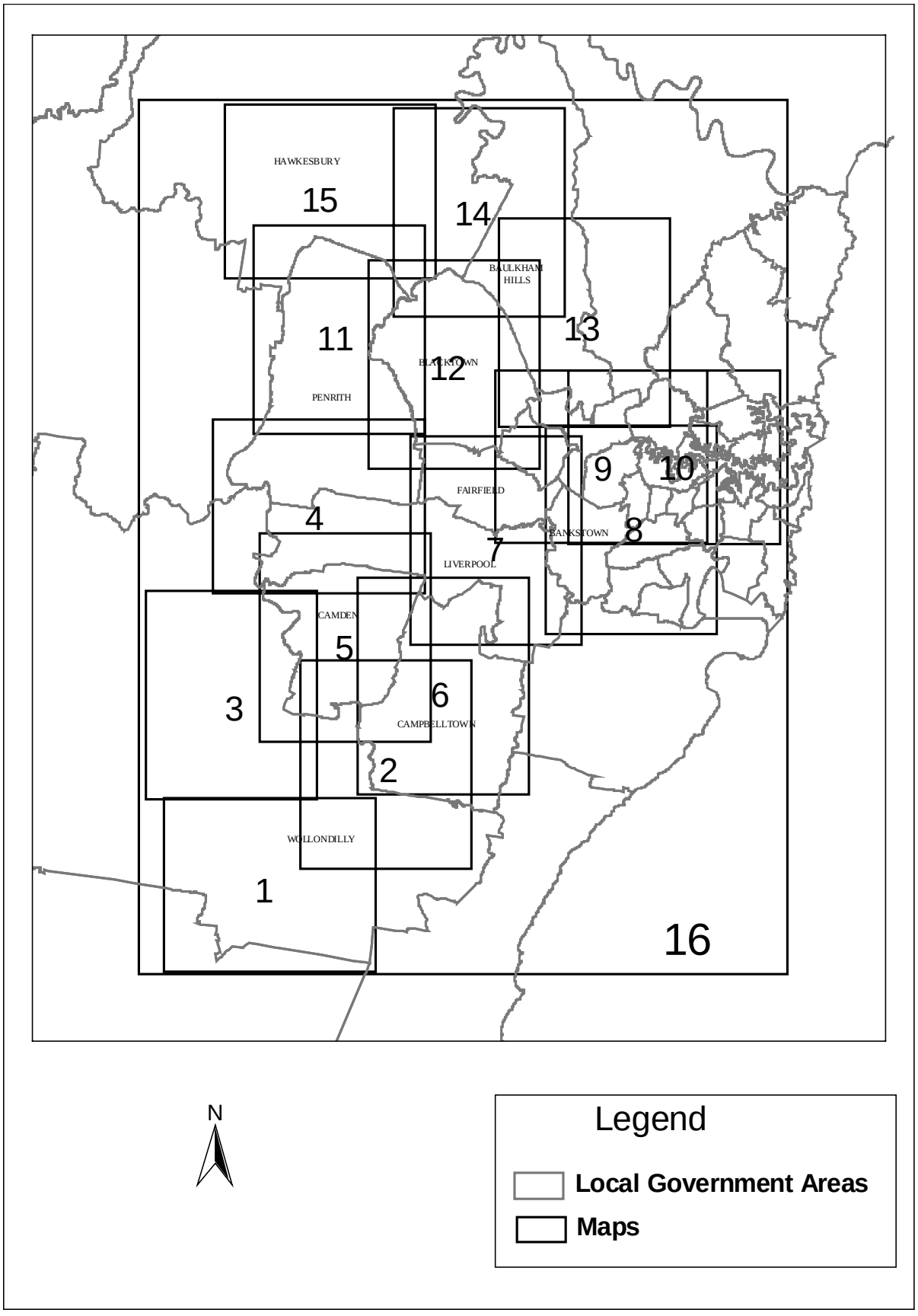
*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

Vegetation of WOLLONDILLY LGA

Vegetation Communities	Extant Vegetation											Modelled Pre-1750 Vegetation	Proportion Remaining	
	Canopy Cover >10% (except B, where CC >5%)					Canopy Cover <10%				Urban Remnant Trees	All Codes		All Codes	A+B+C+SA
	A (ha)	B (ha)	C (ha)	SA (ha)	Total A+B+C+SA (ha)	Cmi (ha)	TX (ha)	TXR (ha)	Total Cmi+TX+TXR (ha)	Total TXU (ha)	Total (ha)	Total (ha)	(%)	(%)
1 - Shale Sandstone Transition Forest (Low Sandstone Influence)	472.9	106.0			578.9	91.5	815.1	47.4	954.1	118.5	1,651.5	7,232.6	22.8%	8.0%
2 - Shale Sandstone Transition Forest (High Sandstone Influence)	4,268.5	303.3			4,571.8	101.5	3,002.5	246.3	3,350.3	464.6	8,386.7	15,798.2	53.1%	28.9%
Sub-total - 1 & 2 Shale Sandstone Transition Forest	*4,741.4*	*409.3*	*0.0*	*0.0*	*5,150.7*	*193.0*	*3,817.6*	*293.7*	*4,304.3*	*583.1*	*10,038.1*	*23,030.8*	*43.6%*	*22.4%*
3 - Cooks River Castlereagh Ironbark Forest					0.0				0.0				na	na
4 - Castlereagh Swamp Woodland					0.0				0.0				na	na
6 - Castlereagh Scribbly Gum Woodland*					0.0				0.0				na	na
8 - Agnes Banks Woodland					0.0				0.0				na	na
9 - Shale Hills Woodland	1,497.7	267.8	60.5		1,826.0	898.8	1,546.8	41.6	2,487.2	15.6	4,328.8	13,677.4	31.6%	13.4%
10 - Shale Plains Woodland	132.7	74.4	2.3		209.4	19.2	507.2	17.3	543.7	11.1	764.2	5,551.6	13.8%	3.8%
Sub-total - 9 & 10 Cumberland Plain Woodland	*1,630.5*	*342.2*	*62.7*	*0.0*	*2,035.4*	*918.0*	*2,054.0*	*58.9*	*3,030.9*	*26.7*	*5,093.0*	*19,229.0*	*26.5%*	*10.6%*
11 - Alluvial Woodland	448.3	78.3	35.5		562.1	73.8	559.0	6.3	639.2	4.1	1,205.4	6,181.9	19.5%	9.1%
12 - Riparian Forest	196.8	0.6	45.5		242.9	19.4	57.2	0.0	76.7		319.6	535.6	59.7%	45.4%
Sub-total - 11 & 12 Sydney Coastal River-flat Forest	*645.0*	*78.9*	*81.0*	*0.0*	*805.0*	*93.2*	*616.3*	*6.4*	*715.9*	*4.1*	*1,525.0*	*6,717.5*	*22.7%*	*12.0%*
13 - Western Sydney Dry Rainforest	198.7	23.1	70.7		292.5	92.9	84.6		177.6		470.0	900.2	52.2%	32.5%
14 - Moist Shale Woodland	492.8	28.5	36.6		557.8	266.6	168.6	3.9	439.1	0.2	997.1	1,674.8	59.5%	33.3%
15 - Turpentine-Ironbark Forest	1.6	2.1			3.7		6.4	2.4	8.8		12.5	124.0	10.1%	3.0%
43 - Turpentine-Ironbark Margin Forest	23.9	3.1			27.0		40.9		40.9		67.9	92.1	73.7%	29.4%
Sub-total - 15 & 43 Sydney Turpentine-Ironbark Forest	*25.6*	*5.2*	*0.0*	*0.0*	*30.8*	*0.0*	*47.3*	*2.4*	*49.7*	*0.0*	*80.5*	*216.1*	37.2%	14.2%
36 - Freshwater Wetlands*					0.0				0.0				na	na
37 - Elderslie Banksia Scrub Forest					0.0				0.0				n/a	n/a
103 - Shale/Gravel Transition Forest					0.0				0.0				na	na
152 - Blue Gum High Forest					0.0				0.0			21.3	0.0%	0.0%
TOTAL	**7,733.8**	**887.2**	**251.0**	**0.0**	**8,872.0**	**1,563.8**	**6,788.3**	**365.4**	**8,717.5**	**614.2**	**18,203.7**	**51,789.7**	**2.3%**	**1.4%**

*Indicates not listed on Schedule 1 of the Threatened Species Conservation Act

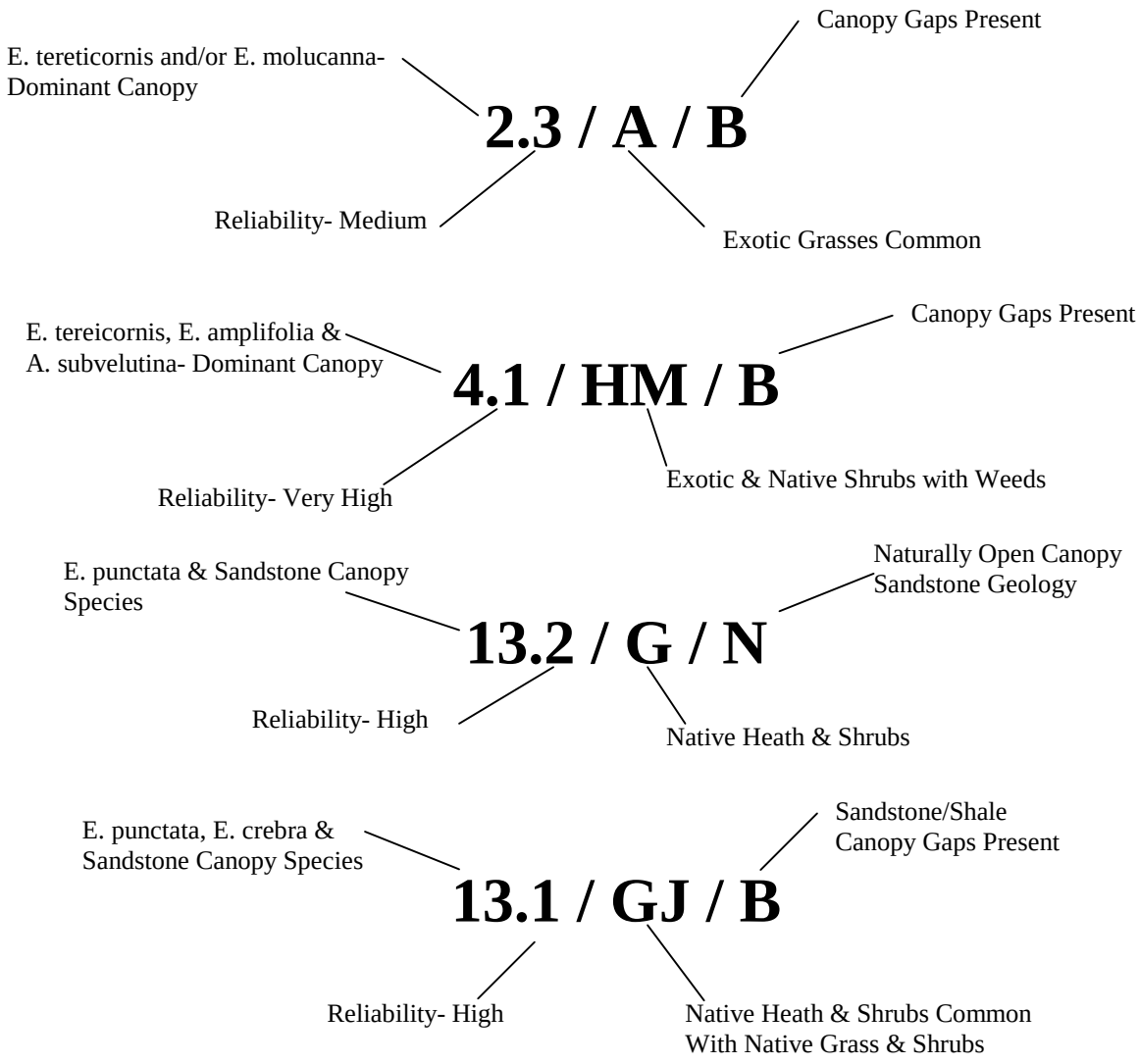
Appendix 3: 1:25 000 Mapsheet layout



Appendix 4: Extract from Roberts (1999) explanation and examples of full and partial polygon codes

Full Code "A" or "C"
Species_Code.reliability/Us1 Us2/Disturbance

Partial Code "B" or "C"
Species_Code.reliability/Us1
Understorey features not always present



Appendix 5: Extract from Roberts (1999) Dominant Canopy Species

Code	Dominant Canopy Species	Topographic Position- Geology
1	***Eucalyptus (E.) maculata**, E. moluccana, E. tereticornis - E. crebra/E. fibrosa sometimes present*	Ridges and side slopes
2	***E. moluccana, E. tereticornis***	All Positions
3	*E. moluccana, E. tereticornis,* ***E. crebra, E fibrosa***	Ridges
3a	*E. molluccana, E. tereticornis,* ***E beyeriana/crebra***	Specific Ridges
4	***Angophora (A.) subvelutina**, E. amplifolia, E. tereticornis*	Floodplains and Riparian Zones - Cumberland Plains
4a	***E. baueriana, E. elata**, A. subvelutina*	Flood Terrace
4b	***E. elata*** - dominant	Flood Terrace
4c	***E. amplifolia, E parramattensis, (E. sideroxylon – sometimes)***	Alluvial
6	***E. fibrosa*** - Broad-leaved Ironbark Dominated Forest	Ridge Tops
6a	***E. fibrosa/Melaleuca spp.***	Lateritic Alluvial – Rises
6b	***E. fibrosa, E.parramattensis, (E. sideroxylon – sometimes)***	
7	***E. sclerophylla,***	Alluvial Rises
7a	***E. sclerophylla, E. fibrosa***	Alluvial Rises
8	***E. sclerophylla, A. bakeri, Banksia serrata***	Aeolian sands
8a	Elderslie - Banksia Woodland	
8b	***Banksia serrata – dominant with E. sclerophylla***	Aeolian deep sands
9	***E. parramattensis***	Alluvial Drainage Lines, and midslopes
9a?	***E parramattensis, E. fibrosa, (E. sideroxylon – sometimes)***	
9b	***E. parramattensis, E. sclerophylla, (E. sideroxylon – sometimes)***	Alluvial midslopes
10	***E. benthami***	Major Gully
11	***Syncarpia(S). glomulifera, E. paniculata*** - Turpentine Ironbark Forest	
12	***E. punctata**, E. resinifera, E. globoidea, E. paniculata, E. fibrosa, E. pilularis, E. eugenioides, E. agglomerata, E. piperita, S. glomulifera, A. costata, A. bakeri* - Transition Forest	
13	*E. resinifera,* ***E. punctata****, A. bakeri, E. eugeniodes/oblonga, E. squamosa, E. sclerophylla, E. racemosa, E. gummifera, E beyeriana/crebra, S. glomulifera, E. baueriana (Uncommon)* - Transition Woodland	
13a	***E. punctata*** - *dominant*	Above sandstone escarpments
13b	***E. maculata, E. punctata**, S. glomulifera, E. oblonga, E. fibrosa*	

13c	***E. piperita, E. punctata,*** *E. beyeriana/crebra*	
28	***E. resinifera****, A. costata, E. eugeniodes, E. goboidea, E. crebra/beyeriana. S. glomulifera* - Transition Forest with *E. punctata* **absent**	Transition, higher rainfall zones
16	***E. botryoides****, E. botryoides/saligna hybrid*	
16a	***E. botryoides****, E. moluccana, E. tereticornis, E. baueriana (uncommon)*	
17	***E. moluccana***	
18	***E. tereticornis***	
19	Sedges/Wetland - Reeds	
20 & 20a	***Heathland***	
21	***Angophora floribunda***	Gully terraces
22	***E. pilularis****, Angophora costata, S. glomulifera*	Exposed Sanstone Escarpments and Gullies
22a	***E. pilularis****, A.. costata,* ***E punctata,*** *S. glomulifera, E piperita, E. paniculata, E. sideroxylon* - Sandstone Transition Forest	
22b	***E. pilularis****, E. gummifera, E. punctata, E. globoidea, A. bakeri*	Ridgetop
23	*E. sclerophylla, E. haemastoma or E. racemosa* - Sandstone Open Heathy Woodland often dominated by Scribbly Gums	Exposed Ridgetops Shallow Soils
24	*Ceratopetalum apetalum, Dorypha apetalum* - Closed Forest and other Rainforests	Protected Sandstone Gullies
24a	*Ceratopetalum apetalum, Acmena smithii* - Closed Forest	
24b	*Closed Forest - Unknown*	Refugia
25	*Tristaniopsis laurina, Casuarina spp.* – Gully Scrub	Seasonally inundated Sandstone Gullies
26	*E. deanii and/or E. saligna, A. floribunda, S. glomulifera*	Sandstone Gullies
27	*E. gummifera, E. oblonga, E. seiberi, E piperita, E. sclerophylla*	Sandstone Ridgetop Woodland/Forest
27a	*E. piperita* – dominant	Sandstone - Lower Slopes
27b	***E. piperita, E. deanii****, A. costata, E. saligna (Eastern Section)*	Sandstone Gullies
29	*E. oblonga, E. punctata, E. sclerophylla, E. parramattensis*	Sandstone Rise
30	*E. fibrosa,* ***E. sideroxylon, E. longifolia****, E. bosistoana, E. moluccana, E. tereticornis*	Broad Undulating Rise
31	E. saligna, E. pilularis, E. paniculata, E. globoidea, S. glomulifera, A. costata	Ridge Tops

Source: Roberts (1999) pp 12-13- Table 3.

Appendix 6: Extract from Roberts (1999) Understorey Composition

Code	Understorey Characteristics	Frequency of use in Mapping
A	*Grasses Dominant- Undifferentiated*	*Common*
B	*Grasses- Exotic Dominant*	*Occasional*
C	*Grasses- Native Dominant*	*Rare*
D	*Grasses- Native and Exotic Present*	*Occasional*
E	*Shrubs Dominant*	*Occasional*
F	*Shrubs- Exotic Dominant*	*Rare*
G	*Shrubs- Native Dominant*	*Common*
H	*Shrubs- Native and Exotic Dominant*	*Occasionally Common*
I	*Shrubs and Grass Co-dominant- Undifferentiated*	*Occasional*
J	*Shrubs and Grass Co-dominant- Native Dominant*	*Common*
K	*Shrubs and Grass Co-dominant- Exotic Dominant*	*Occasional*
L	*Mesic Understorey Dominant*	*Occasionally Common*
M	*Weeds Dominant*	*Occasionally Common*
N	*Olive Dominant*	*Occasionally Common*
O	*Blackberry Dominant*	*Rare*
P	*Casuarinaceae Dominant*	*Occasionally Common*
Q	*Melaleuca Dominant*	*Occasionally Common*
R	*Mangrove Dominant*	*Uncommon*
S	*Saltmarsh Dominant*	*Rare*
T	*Swampy/Sedgy Ground*	*Occasional*
U	*Exotic Conifer and other Exotic Trees*	*Uncommon*
V	*Acacia spp.*	*Occasionally Common*
W	*Water Body*	*Occasional*
X	*Lantana*	*Uncommon*
Y	*Rock*	*Rare*
Z	*Plantation*	*Uncommon*

Source: Roberts (1999) pg 18- Table 4.

Appendix 6 (Continued): Understorey Mosaic Labelling

Code	Frequency in Mapping	Common Canopy Classes	Comments
AJ	Common	2, 3a, 3, 13	Potentially exotic grasses dominant with patches of native shrubs and grasses, eg. *Bursaria spinosa*-disturbed.
AM	Uncommon	4, 2	Potentially exotic grasses with a mosaic of weeds eg. Blackberry, Lantana- disturbed and exotic.
JA	Occasional	2, 3, 7	Native shrubs and grasses co-dominant with patchy exotic grasses present- disturbed natural.
JG	Common	13, 2, 7	Native shrubs and grasses co-dominant with a mosaic of denser native shrubs present- natural.
JK	Occasional	2, 3a	Native shrubs and grasses co-dominant with exotic shrubs and grasses sub-dominant-disturbed natural.
GJ	Uncommon	13	Native shrubs dominant (often snadstone species) with patches of native grasses present- natural.
AH	Occasionally Common	2, 3a	A mosaic of potentially exotic grasses with patches of native and exotic shrub species.
GH	Uncommon	13	Native shrub layer dominant with patches of exotic shrubs present- disturbed natural.
GL	Occasionally Common	13, 16, 16a, 22a, 27a, 26	Tall native shrubs species forming a dense mesic understorey, sometimes with rainforest elements, usually confined to protected gully systems- natural.
HA	Occasionally Common	2, 3a	Native and exotic shrubs dominant with open grassy areas of potentially exotic grasses, eg. Bursaria and Olive through grazing land- disturbed exotic.
HL	Occasionally Common	13, 4, 16, 26, 22, 27a	Tall native and exotic shrub and vine species forming a dense mesic understorey, sometimes with rainforest elements, confined to protected gullies and higher rainfall zones- disturbed and exotic.
HM	Occasional	4, 13	Exotic and native shrubs with weeds, common along severely damaged water courses- disturbed and exotic.
MP	Occasionally Common	4	Weeds dominant with an overstorey of patchy Casuarina, patchy remnants along alluvial streams- disturbed and exotic.
PM	Occasionally Common	4	Casuarina overstorey dominant with an understorey of weeds- disturbed and exotic.
PA	Uncommon	4	Casuarina overstorey with potentially exotic grasses, grazing- disturbed and exotic.
JQ	Occasionally Common	6a, 3, 7a	Native shrubs and grasses co-dominant with a patchy mid-layer overstorey of Melaleuca- natural.
QJ	Occasionally Common	6a, 3	Dense mid-layer overstorey of Melaleuca present with native shrubs and grasses as a ground layer- natural.
QT	Uncommon	9, 4c	Dense mid-layer overstorey of Melaleuca present over seasonally inundated slow draining watercourses, often containing sedges- natural.

Source : Roberts (1999) pg 19- Table 5.

Appendix 7: Extract from Roberts (1999) Disturbance Characteristics

Code	Disturbance Pattern	Comments and use in mapping
A	Canopy Intact	Common in less disturbed gullies and sandstone geologies, a natural overstorey density, understorey possibly disturbed.
B	Canopy Gaps	Very common over all of the study area, noticeable gaps in canopy and crown clustering.
C	Even Canopy Density	Common, usually dense younger crowns, regenerating forest- disturbed canopy ad often disturbed understorey.
D	Presence of Stags	Not used.
E	Soil Disturbance- tracks, erosion, soil and rubish dumping.	Uncommon- Soil disturbance present- mining, clearing and tracks, understorey patchiness.
F	Evidence of grazing or mowing	Rarely used
G	Evidence of fertilizing	Not used
H	Numerous tracks/roads	Uncommon, numerous tracks present but understorey is still often intact.
N	Naturally open	Common, used to differentiate polygons with a similar code which had different natural canopy densities and dominant canopy species- especially more open ‘sandstone’ 13’s compared to the denser ‘shale’ 13’s.
O	No evidence of major disturbance	Uncommon- undisturbed canopy and understorey- natural.
Z	Canopy burnt or scorched- recent fire on photos	Uncommon- used when recent fire on the aerial photographs had confused and affected canopy species recognition.

Source: Roberts (1999) pg 24- Table 7

Appendix 8: Using Lists of Diagnostic Species

These lists are developed after recording cover-abundance indices for all species within 400m^2 plots placed within relatively intact remnants. The data from these plots is then analysed to group similar plots into communities (or into map units that are subsets of listed endangered ecological communities). These lists show which species are useful in identifying the community.

The lists have several types of data:

1. Group frequency – the frequency with which the species was found in plots within that community (during the study).
2. Non-group frequency – the frequency with which the species was found in plots in all other communities.
3. Group score (50 percentile) – the median cover-abundance indice recorded for the species in plots in that community
4. Non-group score – the median cover-abundance indice recorded for the species in plots in all other communities.
5. Fidelity class – an indication of whether the species is useful in identifying the community.
   - 'Positive' fidelity class indicates the species was found in plots in the community much more frequently than in plots in all the other communities.
   - 'Negative' fidelity class indicates that the species is found more frequently in other communities.
   - 'Uninformative' fidelity class indicates that the species does not assist in identifying that community as it is not found frequently in any communities.
   - 'Constant' fidelity class indicates that the species does not assist in identifying the community as it is found frequently in all communities.

For example, *Aristida ramosa* was found in Shale Hills Woodland plots 83.6% of the time but only 17.3% of the time in other communities. and is thus given a positive fidelity class for SHW (NPWS 2000). Plots within which it is found in western Sydney are therefore more likely to be Shale Hills Woodland than other communities. Additionally, it was generally more abundant in SHW plots (Group score of 3) than in non-SHW plots (Non-group score of 2), so a plot where it is very abundant has an even greater likelihood of being SHW.

Data from all of the species found within a 400m^2 plot can then be compared and a decision made as to which community exists in the remnant.

<u>Steps for using diagnostic species lists</u>

1. Use available mapping and information to assess which communities are likely to occur on site.
2. Survey and develop a comprehensive species list for site and compare to characteristic species lists in determinations. Also use other information provided to assist, but list of characteristic species is paramount to determining which endangered ecological community is present.
3. For disturbed sites, surveys may need to be undertaken in adjacent undisturbed vegetation in order to confirm the presence of an endangered ecological community. Where endangered ecological community identification is unsure or requires confirming, continue with the following steps.
4. Conduct a number of 400m^2 survey plots, recording cover-abundance for all species within the plot. Compare data with diagnostic species lists using guide for interpretation above.

5. For heavily disturbed sites it is unlikely that the plot data or diagnostic species will help identify what the community is, or was before disturbance. In these cases, reference should be made to the aforementioned habitat parameters, with plot surveys carried out in adjacent intact vegetation (in the same environment), providing access to that vegetation is permitted.
6. Plot surveys can, however, assist in determining the ability of disturbed vegetation to recover, and thus whether it meets the definition of the EEC in the final determination:
    - On disturbed sites where few native taxa are evident per plot, a number of 400m^2 plots should be surveyed, encompassing all of the disturbance variations within the remnant (eg, a transect of plots crossing disturbance boundaries).
    - The total number of native taxa recorded can be compared to the average number of taxa per plot, and the type of disturbance (slashing or grazing c/f. major soil disturbance) can be assessed to determine whether it is likely that the remnant could readily revegetate.