

Urban Bushland in the Ryde LGA

Prepared for Ryde City Council

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1. Study Overview

1.1 Introduction

In November 1998, Ryde Council commissioned a bushland corridor mapping project with the aim of gaining an overview of the extent and type of remnant bushland and other vegetation in the Ryde LGA. The study's main aims were firstly to map all remnant bushland in the Ryde LGA and to digitise the information for use on Council's GIS system.

In August 2000, Council expanded the study to update the vegetation maps and to prepare a comprehensive information database for the management and restoration of bushland and other vegetation in Ryde. This was a further step towards compiling information that would better allow Council to achieve the objectives of Council's Plan of Management for natural areas.

The database included two additional theoretical maps of vegetation cover as it would have been prior to 1750 and in 1956 as a comparison with today's extent. It further involved the preparation of native plant species list for each of the natural vegetation communities (ecological communities) found in Ryde and a brochure containing information for the establishment of native wildlife-friendly gardens.

Council acquired a more detailed aerial photograph taken in 1998 as the basis for an update the 1995 bushland map. Consultants were engaged to digitise the vegetation shown on the 1998 aerial photo and to prepare vegetation cover maps for 1750 and 1956.

This chapter provides a brief overview of the additional study and method and the tasks undertaken.

1.2 Council Objectives for Additional Vegetation Study

The following objectives guided the preparation of the maps and database:

- *To update existing vegetation maps prepared in 1995 to a more accurate map based on a 1998 aerial photograph*
- *To gain an overview of the approximate extent of native vegetation and bushland pre 1750 prior to European settlement*
- *To gain an approximate overview of the extent of vegetation in 1956 after extensive clearing for agriculture and residential development had taken place*
- *To establish a database for the native plants found in urban bushland in the Ryde LGA*

- *To continue to build a database base that can be used as a planning and management tool and assists Ryde Council in strengthening and expanding the network of wildlife corridors where opportunities arise*
- *To prepare information that assists residents in the establishment of wildlife-friendly native gardens as habitat corridors in Ryde*
- *To identify issues related to the protection of remnant bushland and biodiversity*

1.4 Study Method and Vegetation Mapping

The study method involved the preparation of vegetation maps for 1998, 1956 and 1750 based on aerial photography and soil landscape maps.

The mapping process for the 1998 vegetation map involved a set of digital aerial photographs dated 1998 supplied by Ryde Council. Budget limitations meant that site surveys and visits could not be undertaken for the entire LGA. It was agreed that ground-truthing had to be restricted to a few sites to determine the existence and extent of endangered plant communities on smaller sites where the aerial photographs appeared unclear. The previously prepared maps for 1995 were used as a basis for the identification of vegetation communities and conservation status.

The mapping process for the extent of vegetation in 1956 involved digitising vegetation from a digitised black and white photograph. The remnant vegetation shown on the photo was digitised and interpreted based on the known remnants mapped in 1998 and based on an interpretation of soil landscapes and associated ecological communities.

The mapping for the extent of vegetation was based on the soil landscapes mapped for the Sydney region and associated ecological communities (Chapman, G.A. & Murphy, C.L.; 1989; Soil Landscapes of the Sydney Region 1:100,000 sheet). The interpretation was based on the following:

- Lucas Heights Soils Landscape supports Sydney Turpentine Ironbark Forest and Shale Sandstone Transition Forest
- Glenorie Soil supports Sydney Turpentine Ironbark Forest
- Lane Cove Soil supports Estuarine Complex
- Hawkesbury Soil supports Sydney Sandstone Gully Forest
- West Pennant Hill Soil supports Blue Gum High Forest
- Gymea Soil supports Sydney Sandstone Ridgetop Woodland and some Sydney Sandstone Gully Forest

1.5 Study Outcomes

The outcome of the study includes:

1. A map showing the extent and location of remnant indigenous and other vegetation in 1998 in the Ryde LGA;
2. A map showing the approximate location of ecological communities in 1956 in Ryde LGA;
3. A map showing the approximate location of ecological communities prior to 1750;
4. A GIS data base suitable for integration into Council's GIS system;
5. A report outlining the study process;
6. Comprehensive species lists for each of the ecological communities occurring in Ryde;
7. A brochure and list about indigenous plants suitable for native wildlife-friendly gardens in Ryde.

1.6 Study Tasks

The study was divided into five parts for which the following tasks were completed:

- 1. Mapping of vegetation and ecological communities based on a 1998 digitised aerial photograph**
 - Create a GIS data base showing present extent of vegetation based on 1998 digital aerial photograph and update maps previously prepared;
 - Preparation of a short report providing a brief overview of the mapping method and interpretation of maps;
 - Preparation of 1 CD with digital database and report for use on Council's GIS;
 - Liaison with Council staff and project management.
- 2. Mapping of original extent of native vegetation and ecological communities before European settlement and clearing in Ryde based on soil landscapes and associated vegetation types.**
 - Investigation and interpretation of soil landscapes to identify associated ecological communities;
 - digitising of associated ecological communities;
 - Preparation of GIS database of estimated original extent of ecological communities based on soil landscapes;
 - Preparation of hardcopy map of original extent of vegetation on landuse map for Council's review and use.
- 3. Mapping of extent of native vegetation in 1956 based on an aerial black & white photograph supplied by Ryde Council.**
 - Digitising of extent of ecological communities after clearing from Council's 1956 aerial photographs and preparation of GIS database;
 - Preparation of 1 CD with digital database;

- Liaison with Council staff and project management.

4. Preparation of Lists of Indigenous Plants Species

- Preparation of list showing indigenous plants associated with each of the native vegetation communities;
- Preparation of suitable plant species list for native gardens;
- Liaison with Council staff and project management.

5. Preparation of an Information Kit for Indigenous Plants and Native Gardens

- Preparation and design of an A3 information sheet with introductory text, plant lists, explanations and black and white illustrations showing a map and how to establish habitat and indigenous plant material on private land;
- Preparation of bromide ready for single-colour printing;
- Liaison with Council staff and project management.

2. Native Bushland Plants Species List for Ryde LGA

2.1 Bushland Types in Ryde

Ryde is the home of six complex indigenous plant communities that used to make up the bushland prior to European settlement. These plant communities are:

- Sydney Turpentine-Ironbark Forest,
- Blue Gum High Forest,
- Shale / Sandstone Transition Forest,
- Sydney Sandstone Gully Forest,
- Sydney Sandstone Ridgetop Woodland , and the
- Estuarine Complex.

They have evolved in response to the natural ecological processes of the region and the influences of its underlying geology, soil, climatic conditions, drainage patterns, and the activities of animals and people. Plant communities and species have adapted to these conditions over thousands of years and are now finely tuned to and dependent on local landform, soils, moisture and nutrient levels, frequency of fires, floods and droughts that naturally occurred in the Ryde area.

Before the arrival of British soldiers and settlers on the Australian continent, when Ryde was still inhabited and managed by its Aboriginal people, the land was covered in majestic eucalyptus forests and woodlands with large trees and a diverse, dense understorey, some of it unique rain forest understorey. During 200 years of European agricultural and urban development, most bushland was cleared to make way for farming, housing and industry. Today, only a few remnants of the former bushland remain on inaccessible steep slopes and in gullies along natural drainage lines and the Lane Cove River where opportunities for European development were limited.

As a result of the extensive land clearing, three of the local indigenous plant communities in Ryde are now on the brink of extinction. They are Turpentine-Ironbark Forest, Blue Gum High Forest, and Shale / Sandstone Transition Forest. They are considered endangered and inadequately conserved at the National level and are listed as in danger of becoming extinct under the Threatened Species Conservation Act 1995 (TSC Act). This makes the remnant vegetation of Ryde highly significant and in need of adequate protection and appropriate conservation oriented management.

The largest and/or most significant bushland remnants in the Ryde LGA can be found in the following public areas:

- Lane Cove River National Park,
- Macquarie University Nature Reserve,
- Field of Mars,
- Wallumatta Nature Reserve,
- Darvall Park,
- Denistone Park,
- Stewart Park, and
- Brush Farm Park.

2.2 Sydney Turpentine-Ironbark Forest

Sydney Turpentine-Ironbark Forest used to occur on the deep clay soils of the drier hill sides, plateaux and clay layers in sandstone in Ryde and East Ryde. It was probably the most common native bushland type in Ryde before European settlement. The natural distribution of Sydney Turpentine-Ironbark Forest is limited to the Sydney Region, where it naturally occurred on undulating clay soils overlaying Hawkesbury Sandstone on the Hornsby Plateau and in Sydney's inner-west where rainfall is between 900 and 1,000mm. This landscape type is classified as "Glenoirie soil landscape".

In Sydney Turpentine-ironbark Forest the trees are between 20-30 m tall with an open understorey consisting of flowering shrubs and native grasses. The main canopy trees in this plant community are Turpentine, Angophora, Grey Ironbark, Broad-leaved Ironbark, White Stringybark and Red Mahogany with an understorey of wattles, Hop Bush and native grasses and herbs.

Because this land is very fertile, the forests were cut down for timber and farming, and is now developed for housing. Very few remnants of Turpentine-Ironbark Forest remain in the Sydney region and indeed in Australia. The most substantial remnant in Ryde remains in Wallumatta Reserve in East Ryde. It is owned and managed by the National Park and Wildlife Service. Smaller and unfortunately more degraded remnants can be found locally in Stewart Park, Macquarie University and Meadowbanks Park. The only other significant remnant surviving in Australia is the Newington Forest on the Olympic site in Homebush.

Sydney Turpentine-Ironbark Forest is listed as an endangered community under the Threatened Species Conservation Act 1995. An estimated 0.5% remains of the original extent. This means that Sydney Turpentine-Ironbark Forest is likely to become extinct unless the human activities threatening its survival are ceased and remaining remnants are managed sustainably. Threats are identified as clearing, physical damage from recreational activities, rubbish dumping, mowing and weeds.

2.3 Native Plant Species List – Sydney Turpentine Ironbark Forest

Common Name	Scientific Name
Main Tree Species	
Smooth-barked Apple	Angophora costata
Grey Ironbark	Eucalyptus paniculata
Turpentine	Syncarpia glomulifera
Associated Tree Species	
White Mahogany	Eucalyptus acmenoides
Thin-leaved Stringybark	Eucalyptus eugenoides
Broad-leaved Ironbark	Eucalyptus fibrosa
White Stringybark	Eucalyptus globoidea

Wollybutt	<i>Eucalyptus longifolia</i> .
Grey Box	<i>Eucalyptus punctata</i>
Red Mahogany	<i>Eucalyptus resinifera</i>

Understorey Species:

Small Trees

Parramatta Green Wattle	<i>Acacia parramattensis</i>
Sickle Wattle	<i>Acacia falcata</i>
Forest Oak	<i>Allocasuarina torulosa</i>
White Feather Honey-myrtle	<i>Melaleuca decora</i>

Shrubs

Sydney Golden Wattle	<i>Acacia longifolia</i>
Myrtle Wattle	<i>Acacia myrtifolia</i>
Breynia	<i>Breynia oblongifolia</i>
Sweet Bursaria	<i>Bursaria spinosa</i>
Gorse Bitter-pea	<i>Daviesia ulicifolia</i>
Common Hop Bush	<i>Dodonaea triquetra</i>
Cherry Ballart	<i>Exocarpos cupressiformis</i>
Tick Bush	<i>Kunzea ambigua</i>
Maytenus	<i>Maytenus silvestris</i>
Large Mock Olive	<i>Notelaea longifolia</i>
Yellow Pittosporum	<i>Pittosporum revolutum</i>
Elderberry Panax	<i>Polyscias sambucifolia</i>
Muttonwood	<i>Rapanea variabilis</i>

Groundcovers

Speargrass	<i>Aristida</i> spp.
Pale Vanilla Lily	<i>Arthropodium milleflorum</i>
Dumplings, Apple Berry	<i>Billardiera scandens</i>
Bothriochloa	<i>Bothriochloa decipiens</i>
Blue Trumpet, Blue Yam	<i>Brunoniella australis</i>
Carex	<i>Carex inversa</i>
Swamp Pennywort	<i>Centella asiatica</i>
Poison Rock Fern, Mulga Fern	<i>Cheilanthes sieberi</i>
Old Man's Beard	<i>Clematis glycinoides</i>
Sedge	<i>Cyperus gracilis</i>
Wallaby Grass	<i>Danthonia linkii</i>
Wallaby Grass	<i>Danthonia racemosa</i>
Wallaby Grass	<i>Danthonia tenuior</i>
Slender Tick-trefoil	<i>Desmodium varians</i>
Blue Flax Lily	<i>Dianella caerulea</i>
Rare Plume Grass	<i>Dichelachne rara</i>
Kidney Weed	<i>Dichondra repens</i>
Smallflower Fingergrass	<i>Digitaria parviflora</i>
Salooop	<i>Einadia</i> spp.
Wiry Panic	<i>Entolasia stricta</i>
Love Grass	<i>Eragrostis leptostachya</i>
Love Creeper	<i>Glycine tabacina</i>

Violet-leaved Goodenia	<i>Goodenia hederacea</i>
False Sarsparilla	<i>Hardenbergia violacea</i>
Common Rush	<i>Juncus usitatus</i>
Running Postman	<i>Kennedia rubicunda</i>
Variable Sword-sedge	<i>Lepidosperma laterale</i>
Wattle Mat-rush	<i>Lomandra filiformis</i>
Spiny-headed Mat-rush	<i>Lomandra longifolia</i>
Meadow Rice Grass	<i>Microlaena stipoides</i>
Ball Everlasting	<i>Ozothamnus diosmifolius</i>
Wonga vine	<i>Pandorea pandorana</i>
Two Colour Panic	<i>Panicum simile</i>
Paspalidium	<i>Paspalidium distans</i>
Pomax	<i>Pomax umbellata</i>
Solenogyne	<i>Solenogyne bellioides</i>
Slender Stackhousia	<i>Stackhousia viminea.</i>
Tall Spear Grass	<i>Stipa pubescens</i>
Kangaroo Grass	<i>Themeda australis</i>
Veronia	<i>Vernonia cinerea</i>
Creeping Speedwell	<i>Veronica plebeia</i>
Australian Bluebell	<i>Wahlenbergia gracilis</i>

2.4 Blue Gum High Forest

Originally Blue Gum High Forest grew on deeper clay soils derived from Wianamatta Shales on upper slopes and gullies in the high rainfall areas (1,100 to 1,200 mm) associated with the Hornsby Plateau. This majestic forest is generally associated with the moister south-east facing steep slopes of the West Pennant Hill soil landscape. Severe felling of this forest for timber and for agriculture in the deep soils resulted in the loss of 99% of the original extent of this diverse and species-rich forest.

Today, remnants of Blue Gum High Forest can be found on deep clay soils on south facing slopes in Denistone, Eastwood and West Ryde. The steep slopes and gullies made the land unsuitable for agriculture and urban development and consequently preserved the original bushland by default.

Blue Gum High Forest is composed of big trees dominated by the tall straight trunks of Sydney Blue Gums, which can grow over 40m in height in places of high moisture. Other trees include Blackbutt, Smooth-barked Apple, Grey Ironbark, White Stringybark, Turpentine and Forest Oak with a diverse understorey of moisture loving small trees and shrubs often typical of rainforest. It is unique.

The most significant Blue Gum High Forest remnants in Ryde remain in Brush Farm Park, Darvall Park and Denistone Park where rainforest species occur in sheltered moist gullies.

Blue Gum High Forest is listed as an endangered ecological community under the Threatened Species Conservation Act 1995. Its natural distribution is limited to the

northern suburbs of Sydney. Blue Gum High Forest is likely to become extinct unless the human activities threatening its survival are ceased

2.5 Native Species List - Blue Gum High Forest

Common Name	Scientific Name
Main Tree Species	
Blackbutt	<i>Eucalyptus pilularis</i>
Sydney Blue Gum	<i>Eucalyptus saligna</i>
Associated Tree Species	
Smooth-barked Apple	<i>Angophora costata</i>
Rough-barked Apple	<i>Angophora floribunda</i>
White Stringybark	<i>Eucalyptus globoidea</i>
Grey Ironbark	<i>Eucalyptus paniculata</i>
Sydney Peppermint	<i>Eucalyptus piperita</i>
Turpentine	<i>Syncarpia glomulifera</i>
Understorey Species:	
Trees	
Hickory	<i>Acacia implexa</i>
Forest Oak	<i>Allocasuarina torulosa</i>
Blueberry Ash	<i>Elaeocarpus reticulatus</i>
Yellow Pittosporum	<i>Pittosporum revolutum</i>
Native Daphne	<i>Pittosporum undulatum</i>
Shrubs	
Breynia	<i>Breynia oblongifolia</i>
Hairy Clerodendrum	<i>Clerodendrum tomentosum</i>
Common hop Bush	<i>Dodonaea triquetra</i>
Prickly Beard-heath	<i>Leucopogon juniperinus</i>
Lance-leaf Beard-heath	<i>Leucopogon lanceolatus</i>
Large Mock Olive	<i>Notelaea longifolia</i>
Narrow-leaf Geebung	<i>Persoonia linearis</i>
Handsome Flat-pea	<i>Platylobium formosum</i>
Elderberry Panax	<i>Polyscias sambucifolia</i>
Muttonwood	<i>Rapanea variabilis</i>
Sandfly Ziera	<i>Zieria smithii</i>
Groundcovers	
Common Maidenhair fern	<i>Adiantum aethiopicum</i>
Apple-berry	<i>Billardiera scandens</i>
Gristle Fern	<i>Blechnum cartilagineum</i>
Brachycome	<i>Brachycome angustifolia</i>
False Bracken Fern	<i>Calochlaena dubia</i>
Traveller's Joy	<i>Clematis aristata</i>
Old Man's Beard	<i>Clematis glycinoides</i>

Rusty Tick-trefoil	Desmodium rhytidophyllum
Rasp Fern	Doodia aspera
Tufted Hedgehog Grass	Echinopogon caespitosus
Wombat Berry	Eustrephus latifolius
Love Creeper	Glycine tabacina
Variable-leaved Goodenia	Goodenia heterophylla
False Sarsparilla	Hardenbergia violacea
Button Everlasting Daisy	Helichrysum scorpioides
Rough Guinea Flower	Hibbertia aspera
Golden Guinea-flower	Hibbertia scandens
Running Postman	Kennedia rubicunda
Spiny-headed Mat-rush	Lomandra longifolia
Wonga Vine	Pandorea pandorana
Tussock Grass	Poa affinis
Small Poranthera	Poranthera microphylla
White Root	Pratia purpurascens
False Eranthemum	Pseuderanthemum variable
Common Bracken Fern	Pteridium esculentum
Native Raspberry	Rubus parvifolius
Native Sarsparilla	Smilax glyciphylla
Kangaroo Grass	Themeda australis
Bearded Tylophora	Tylophora barbata.

2.6 Sydney Sandstone Gully Forest Complex

Sydney Sandstone Gully Forest grows in sheltered gullies, slopes and hillsides on Hawkesbury Sandstone. In Ryde, sandstone vegetation occurs generally where the Lane Cove River and local creeks have eroded deep gullies into the underlying sandstone. Consequently, instead of vegetation associated with deep clay soils of the plateau, the gullies display characteristics typical of sandstone ecology and associated vegetation communities are commonly found.

Sydney Sandstone Gully Forest is a diverse community, which varies in structure from tall open forest to open forest, woodland and closed forest in deeper, moister gullies where rainforest species occur. Typical trees are Sydney Peppermint, Blackbutt, Sydney Blue Gum, Turpentine, Red Bloodwood and Smooth-barked Angophora.

Relatively substantial remnants remain along natural creek lines and on moister slopes at Terrys Creek, Kittys Creek and the Lane Cove River in the Ryde LGA. However, the practice of draining stormwater runoff from developed land into natural gullies, has resulted in increased nutrients loads and weed invasion, which is out-competing indigenous understorey plants and severely reducing indigenous species diversity.

2.7 Native Species List – Sydney Sandstone Gully Forest

Common Name	Scientific Name
Main Tree Species	
Smooth-barked Apple	<i>Angophora costata</i>
Red Bloodwood	<i>Corymbia gummifera</i>
Sydney Peppermint	<i>Eucalyptus piperita</i>
Grey Gum	<i>Eucalyptus punctata</i>
Blackbutt	<i>Eucalyptus pilularis</i>
Turpentine	<i>Syncarpia glomulifera</i>
Tall open-forest:	
Mountain Blue Gum	<i>Eucalyptus deanei</i>
Blackbutt	<i>Eucalyptus pilularis</i>
Sydney Blue Gum	<i>Eucalyptus saligna</i>
Turpentine	<i>Syncarpia glomulifera</i>
Closed-forest:	
Coachwood	<i>Ceratopetalum apetalum</i>
River Gum	<i>Tristaniopsis laurina</i>
Understorey Species:	
Trees:	
Sally Wattle	<i>Acacia floribunda</i>
Black She Oak	<i>Allocasuarina littoralis</i>
Forest Oak	<i>Allocasuarina torulosa</i>
Rough-barked Apple	<i>Angophora floribunda</i>
Grey Myrtle	<i>Backhousia myrtifolia</i>
Blueberry Ash	<i>Elaeocarpus reticulatus</i>
Cheese Tree	<i>Glochidion ferdinandi</i>
Yellow Pittosporum	<i>Pittosporum revolutum</i>
Native Daphne	<i>Pittosporum undulatum</i>
Scrub Beefwood	<i>Stenocarpus salignus</i>
Shrubs	
Sunshine Wattle	<i>Acacia terminalis</i>
Old Man Banksia	<i>Banksia serrata</i>
Bossiaea	<i>Bossiaea lenticularis</i>
Christmas Bush	<i>Ceratopetalum gummiferum.</i>
Blackwattle	<i>Callicoma serratifolia</i>
Hairy Clerodendrum	<i>Clerodendrum tomentosum</i>
Common Hop Bush	<i>Dodonaea triquetra</i>
Yellow Tea-tree	<i>Leptospermum polygalifolium</i>
Prickly Beard-heath	<i>Leucopogon juniperinus</i>

Lance-leaf Beard-heath	<i>Leucopogon lanceolatus</i>
Large Mock Olive	<i>Notelaea longifolia</i>
Bleeding heart	<i>Omalanthus nutans</i>
Narrow-leaved Geebung	<i>Persoonia linearis</i>
Phebalium	<i>Phebalium dentatum</i>
Narrow-leaf Platysace	<i>Platysace linearifolia</i>
Elderberry Panax	<i>Polyscias sambucifolia</i>
Smooth Pomaderris	<i>Pomaderris elliptica</i>
Rusty Pomaderris	<i>Pomaderris ferruginea</i>
Bush Pea	<i>Pultenaea daphnoides</i>
Graceful Bush-pea	<i>Pultenaea flexilis</i>
Sandfly Zieria	<i>Zieria smith</i>

Groundcovers

Common Maidenhair	<i>Adiantum aethiopicum</i>
Gristle Fern	<i>Blechnum cartilagineum</i>
Native Grape, Water Vine	<i>Cissus</i> spp.
Paroo Lily	<i>Dianelia caerulea</i>
Small Rasp Fern	<i>Doodia caudata</i>
Panic	<i>Entolasia marginata</i>
Guinea Flower	<i>Hibbertia dentata</i>
Common filmy-fern	<i>Hymenophyllum cupressiforme</i>
Running Postman	<i>Kennedia rubicunda</i>
Yellow Rock Orchid	<i>Liparis reflexa</i>
Spiny-headed Mat-rush	<i>Lomandra longifolia</i>
Common Bracken Fern	<i>Pteridium esculentum</i>
Rock Felt-fern	<i>Pyrrhosia rupestris</i>
Black Bog-rush	<i>Schoenus melanostachys</i>
Indian Weed	<i>Siegesbeckia orientalis</i>

2.8 Sydney Sandstone Ridgetop Woodland

Sydney Sandstone Ridgetop Woodland can be found on ridgetops where soils are sandy and shallow and on dry exposed slopes on Hawkesbury Sandstone. Considerable variation can be seen in structure and floristics of this bushland community. It varies from open forest to open woodland to open scrub and heathland.

Typical trees are Scribbly Gum, Red Bloodwood, Yellow Bloodwood, Smooth-barked Angophora, Narrow-leaved Angophora, Sydney Peppermint with a diverse understorey of shrubs and herbs including Banksias and Hakeas.

Ridgetop Woodland is typically associated with the Sydney landscape as a result of its high visibility and scenic qualities associated with the gnarled shapes of the stunted trees, glistening colours of the smooth barks and the striking shapes of the heath flowers.

In Ryde it occurs in a few locations on exposed sandstone ridges and at the tops of gullies. Most of it has been removed for housing. Remnants can be found on Sugarloaf Hill.

2.9 Native Species List – Sydney Sandstone Ridgetop Woodland

Common Name	Scientific Name
Main Tree Species	
Narrow-leaved Apple	<i>Angophora bakeri</i>
Smooth-barked apple	<i>Angophora costata</i>
Yellow Bloodwood	<i>Corymbia eximia</i>
Red Bloodwood	<i>Corymbia gummifera</i>
Scribbly Gum	<i>Eucalyptus haemastoma</i>
Scribbly Gum	<i>Eucalyotus sclerophylla</i>
Scribbly Gum	<i>Eucalyptus racemosa</i>
Sydney Peppermint	<i>Eucalyptus piperita.</i>
Scaly Bark	<i>Eucalyptus squamosa</i>
Associated Tree Species:	
Dwarf Apple	<i>Angophora hispida.</i>
Stringybark	<i>Eucalyptus oblonga</i>
Grey Gum	<i>Eucalyptus punctata</i>
Narrow-leaved Stringybark	<i>Eucalyptus sparsifolia</i>
Silvertop Ash	<i>Eucalyptus sieberi</i>
Associated Understorey Species:	
Trees	
Wattle	<i>Acacia hispidula</i>
Myrtle Wattle	<i>Acacia myrtifolia</i>
Sweet-scented Wattle	<i>Acacia suaveolens</i>
Sunshine Wattle	<i>Acacia terminalis</i>
Black She-oak	<i>Allocasuarina littoralis</i>
Shrubs	
Heath Banksia	<i>Banksia ericifolia</i>
Silver Banksia	<i>Banksia marginata</i>
Old Man Banksia	<i>Banksia serrata</i>
Hairpin Banksia	<i>Banksia spinulosa</i>
Sydney Boronia	<i>Boronia ledifolia</i>
Bossiaea	<i>Bossiaea lenticularis</i>
Bossiaea	<i>Bossiaea rhombifolia</i>
Long-leaf Coneseeds	<i>Conospermum longifolium</i>
Eggs and Bacon	<i>Dillwynia retorta</i>

Wedge-pea	<i>Gompholobium grandiflorum</i>
Red Spider flower	<i>Grevilea speciosa</i>
Grey Spider flower	<i>Grevillea buxifolia</i>
Needle-bush	<i>Hakea sericea</i>
Narrow-leafed Hovea	<i>Hovea linearis</i>
Broad-leaf Drumsticks	<i>Isopogon anemonifolius</i>
Pink Kunzea	<i>Kunzea capitata</i>
Mountain Devil	<i>Lambertia formosa</i>
Red Rusty-petals	<i>Lasiopetalum rufum</i>
Tea-tree	<i>Leptospermum trinervium</i>
Beard Heath	<i>Leucopogon muticus</i>
Crinkle Bush	<i>Lomatia silaifolia</i>
Purple Mirbelia	<i>Mirbelia speciosa</i>
Tree Broom-heath	<i>Monotoca elliptica</i>
Broad-leaf Geebung	<i>Persoonia levis</i>
Narrow-leaf Geebung	<i>Persoonia linearis</i>
Stalked Conesticks	<i>Petrophile pedunculata</i>
Prickly Conesticks	<i>Petrophile sessilis</i>
Scaly Phebalium	<i>Phebalium squamulosum</i>
Thyme Spurge	<i>Phyllanthus hirtellus</i>
Spurge	<i>Ptilantherium deustum.</i>

Groundcovers

Flannel Flower	<i>Actinotus heliathi</i>
Sedge	<i>Cyathochaeta diandra</i>
Spreading Flax Lily	<i>Dianella revoluta</i>
Wiry Panic	<i>Entolasia stricta</i>
Scale-rush	<i>Lepyrodia scariosa</i>
Pale Mat-rush	<i>Lomandra glauca</i>
Twisted Mat-rush	<i>Lomandra obliqua</i>
Silky Purple-flag	<i>Patersonia sericea</i>

2.10 Shale/Sandstone Transition Forest

Shale/Sandstone Transition Forest is a native plant community, which occurs in the narrow band where the gently undulating Cumberland Plain meets steep slopes of the Sandstone Country. It often occurs in linear shape between Turpentine Ironbark Forest and Sandstone Gully Forest and can be found in stands as narrow as 20 meters in width.

This plant community has evolved in the specific conditions characteristic of the transitional areas between the clay soils derived from Wianamatta Shales and the sandy soils and cliffs of the Hawkesbury Sandstone. Its natural distribution is limited to the margins of the Cumberland Plain in the Sydney Region.

The coming together of two distinct landscape types means that the species associated with each of the adjacent ecosystems intermingle to form an individual distinct unit. Characteristics are high diversity and unusual species composition. The structure of the community is forest or woodland with an understorey of shrubs and native grasses and herbs. Typical trees are Grey Gum, White Stringybark, Red Mahogany, Grey Ironbark, Broad-leaved Ironbark, and Narrow-leaved Ironbark.

Small stands of this naturally rare community remain, of which a small number can be found in the northern area of the Ryde LGA along Epping Road and near Macquarie University.

Shale/Sandstone Transition Forest is listed as an endangered ecological community under the Threatened Species Conservation Act 1995. In view of the small size of existing remnants and the threat of further clearing and other threatening processes, the community is likely to become extinct unless threatening activities cease.

2.11 Native Species List – Shale/Sandstone Transition Forest

Common Name	Scientific Name
Main Tree Species	
Blue-leaved Stringybark	<i>Eucalyptus agglomerata</i>
Narrow-leaved Ironbark	<i>Eucalyptus crebra</i>
Thin-leaved Stringybark	<i>Eucalyptus eugenioides</i>
Broad-leaved Ironbark	<i>Eucalyptus fibrosa</i>
White Stringybark	<i>Eucalyptus globoidea</i>
Grey Ironbark	<i>Eucalyptus paniculata</i>
Grey Gum	<i>Eucalyptus punctata</i>
Red Mahogany	<i>Eucalyptus resinifera</i>
Narrow-leaved Stringybark	<i>Eucalyptus sparsifolia</i>
Associated Tree Species:	
Strong shale influence:	
Forest Oak	<i>Allocasuarina torulosa</i>
Spotted Gum	<i>Corymbia maculata</i>
Scribbly Gum	<i>Eucalyptus haemastoma</i>
Blackbutt	<i>Eucalyptus pilularis</i>
Turpentine	<i>Syncarpia glomulifera</i>
Strong sandstone influence:	
Narrow-leaved Apple	<i>Angophora bakeri</i>
Smooth-barked Apple	<i>Angophora costata</i>
Yellow Bloodwood	<i>Corymbia eximia</i>
Red Bloodwood	<i>Corymbia gummifera</i>
Blue Mountain Mahogany	<i>Eucalyptus notabilis</i>

Stringybark	<i>Eucalyptus oblonga</i>
Scribbly Gum	<i>Eucalyptus racemosa</i>
Hard-leaved Scribbly Gum/	<i>Eucalyptus sclerophylla</i>
Scaly Bark	<i>Eucalyptus squamosa</i>

Associated Understorey Species: **Mixture of species found on both Wianamatta Shale and Sandstone**

Shale:

Trees

Sydney Green Wattle	<i>Acacia decurrens</i>
Sickle Wattle	<i>Acacia falcata</i>
Hickory	<i>Acacia implexa</i>
Parramatta Green Wattle	<i>Acacia parramattensis</i>

Shrubs

Breynia	<i>Breynia oblongifolia</i>
Blackthorn	<i>Bursaria spinosa</i>
Common Hop Bush	<i>Dodonaea triquetra.</i>
Cherry Ballart	<i>Exocarpos cupressiformis</i>
Native Indigo	<i>Indigofera australis</i>
Spurge	<i>Phyllanthus gasstroemii</i>
Eggs and Bacon	<i>Pultenaea villosa</i>

Groundcovers

Wire Grass	<i>Aristida vagans</i>
Pale Vanilla Lily	<i>Arthropodium milleflorum</i>
Bossiaea	<i>Bossiaea prostrata</i>
	<i>Bracteata bracteantha</i>
Blue Burr-daisy	<i>Calotis cuneifolia</i>
Barbed-wire Grass	<i>Cymbopogon refractus</i>
Wallaby Grass	<i>Danthonia tenuior</i>
Saloop	<i>Einadia hastata</i>
Twining Glycine	<i>Glycine clandestina</i>
False Sarsparilla	<i>Hardenbergia violacea</i>
Guinea Flower	<i>Hibbertia diffusa</i>
Small St John's Wort	<i>Hypericum gramineum</i>
Prickly Beard Heath	<i>Leucopogon juniperinus</i>
Wattle Mat-rush	<i>Lomandra filiformis</i>
Meadow Rice Grass	<i>Microlaena stipoides</i>
Ball Everlasting	<i>Ozothamnus diosmifolius</i>
Handsome flat-pea	<i>Platylobium formosum</i>
Tussock Grass	<i>Poa labillardieri</i>
White Root	<i>Pratia purpurascens</i>
Indian Weed	<i>Siegesbeckia orientalis</i>
Forest Nightshade	<i>Solanum prinophyllum</i>
Sand Couch	<i>Sporobolus creber</i>
Forest Starwort	<i>Stellaria flaccida</i>

Kangaroo Grass	<i>Themeda australis</i>
Veronia	<i>Vernonia cinerea</i>
Australian Bluebell	<i>Wahlenbergia</i> spp.

Sandstone:

Trees

Black She Oak	<i>Allocasuarina littoralis</i>
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Shrubs

Tea-tree	<i>Leptospermum trinervium</i>
Needle-bush	<i>Hakea sericea</i>
Gorse Bitter-pea	<i>Daviesia ulicifolia</i>
Lance-leaf Beard-heath	<i>Leucopogon lanceolatus</i>
Beard Heath	<i>Leucopogon muticus</i>
Narrow-leaf Geebung	<i>Persoonia linearis</i>
Green Spider-flower	<i>Grevillea mucronulata</i>
Pale Ballart	<i>Exocarpos strictus</i>
Thyme Honey-myrtle	<i>Melaleuca thymifolia</i>
Five-corners	<i>Styphelia laeta</i>
Prickly Wattle	<i>Acacia brownii</i>
Thyme Spurge	<i>Phyllanthus hirtellus</i>
Bitter Cryptandra	<i>Cryptandra amara</i>
Hairpin Banksia	<i>Banksia spinulosa</i>
Long-leaf Star-hair	<i>Astrotricha latifolia</i>
Graceful Bush-pea	<i>Pultenaea flexilis</i>
Spiny Bossiaea	<i>Bossiaea obcordata</i>
Broad-leaved Hakea	<i>Hakea dactyloides</i>
Small-leaved White-beard	<i>Leucopogon microphyllus</i>
Wedge-pea	<i>Gompholobium grandiflorum</i>
Crinkle Bush	<i>Lomatia silaifolia</i> .

Groundcovers

Spiny-headed Mat-rush	<i>Lomandra longifolia</i>
Wiry Panic	<i>Entolasia stricta</i>
Blue Flax Lily	<i>Dianella prunina</i>

Species typical of shale

and sandstone:

Shrubs

Slender Rice-flower	<i>Pimelea linifolia</i>
Prickly Beard-heath	<i>Leucopogon juniperinus</i>
Small-leaved Daisy-bush	<i>Olearia microphylla</i> .
Tick Bush	<i>Kunzea ambigua</i>

Groundcovers

Pomax	<i>Pomax umbellata</i>
Ivy Goodenia	<i>Goodenia hederacea</i>

Mulga Fern	<i>Cheilanthes sieberi</i>
Button Everlasting	<i>Ozothamnus diosmifolius</i>
Brown's Love Grass	<i>Eragrostis brownii</i>
Rough Guinea Flower	<i>Hibbertia aspera</i>

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3. Maps

Ecological Communities within Ryde LGA

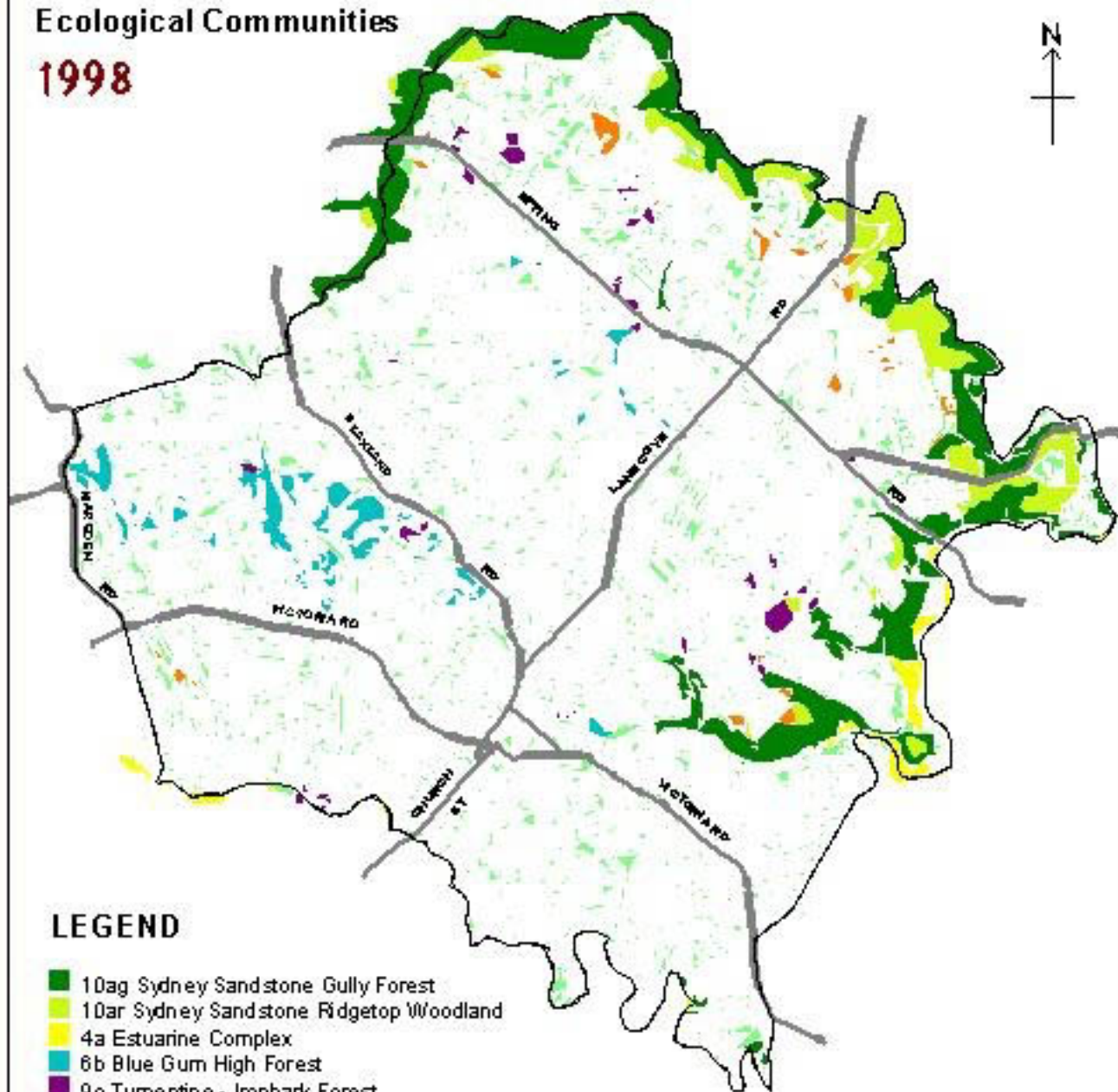
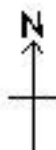
Conservation Status of Vegetation

Ecological Communities 1950's

Ecological Communities pre 1750's



Ecological Communities

1998



LEGEND

-  10ag Sydney Sandstone Gully Forest
-  10ar Sydney Sandstone Ridgetop Woodland
-  4a Estuarine Complex
-  6b Blue Gum High Forest
-  9o Turpentine - Ironbark Forest
-  TF - Shale/Sandstone Transition Forest
-  Other Vegetation

-  City Boundary
-  Arterial Roads

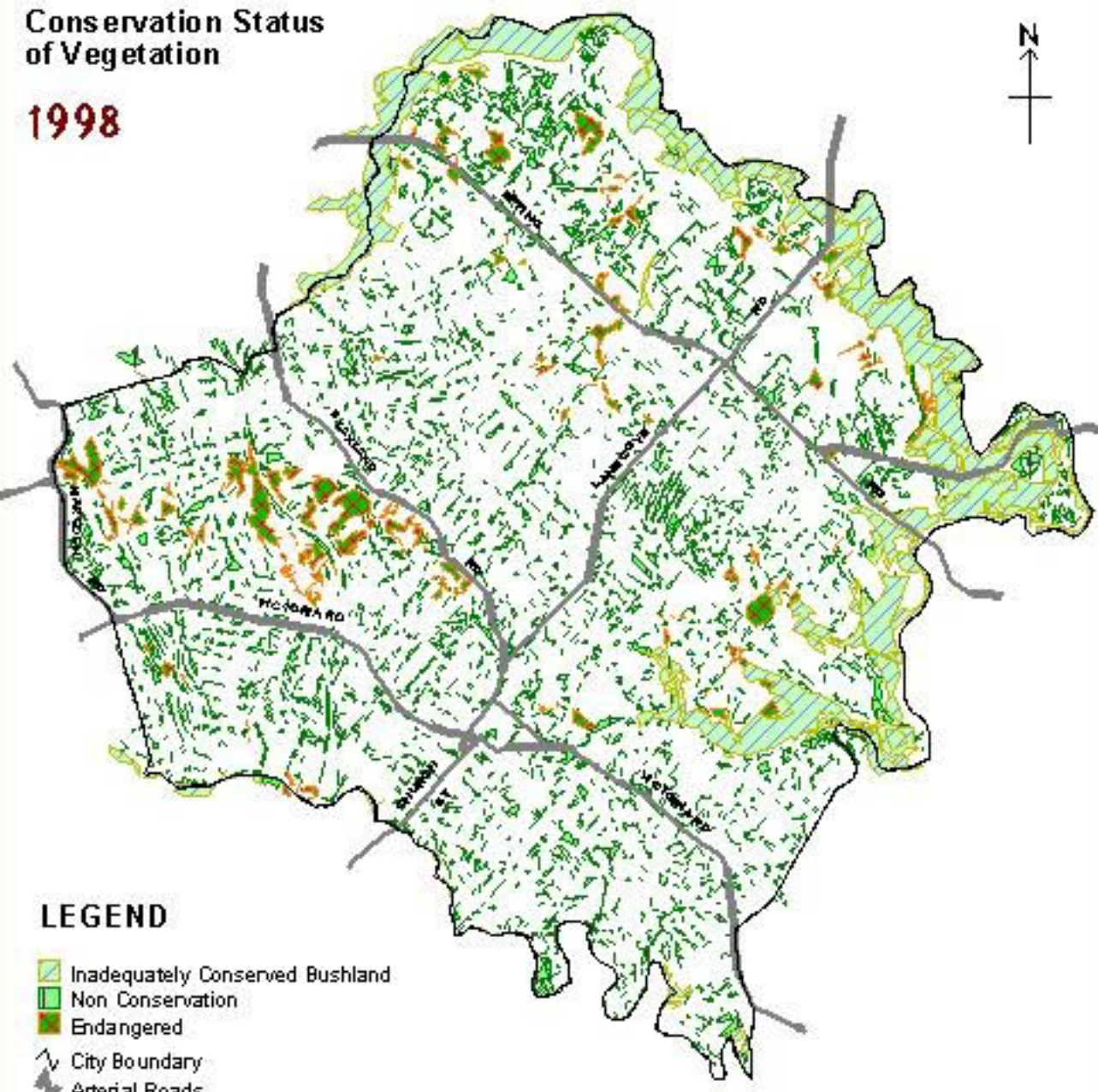
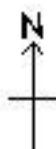
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CITY MANAGEMENT INFORMATION UNIT



Conservation Status of Vegetation

1998



LEGEND

-  Inadequately Conserved Bushland
-  Non Conservation
-  Endangered
-  City Boundary
-  Arterial Roads

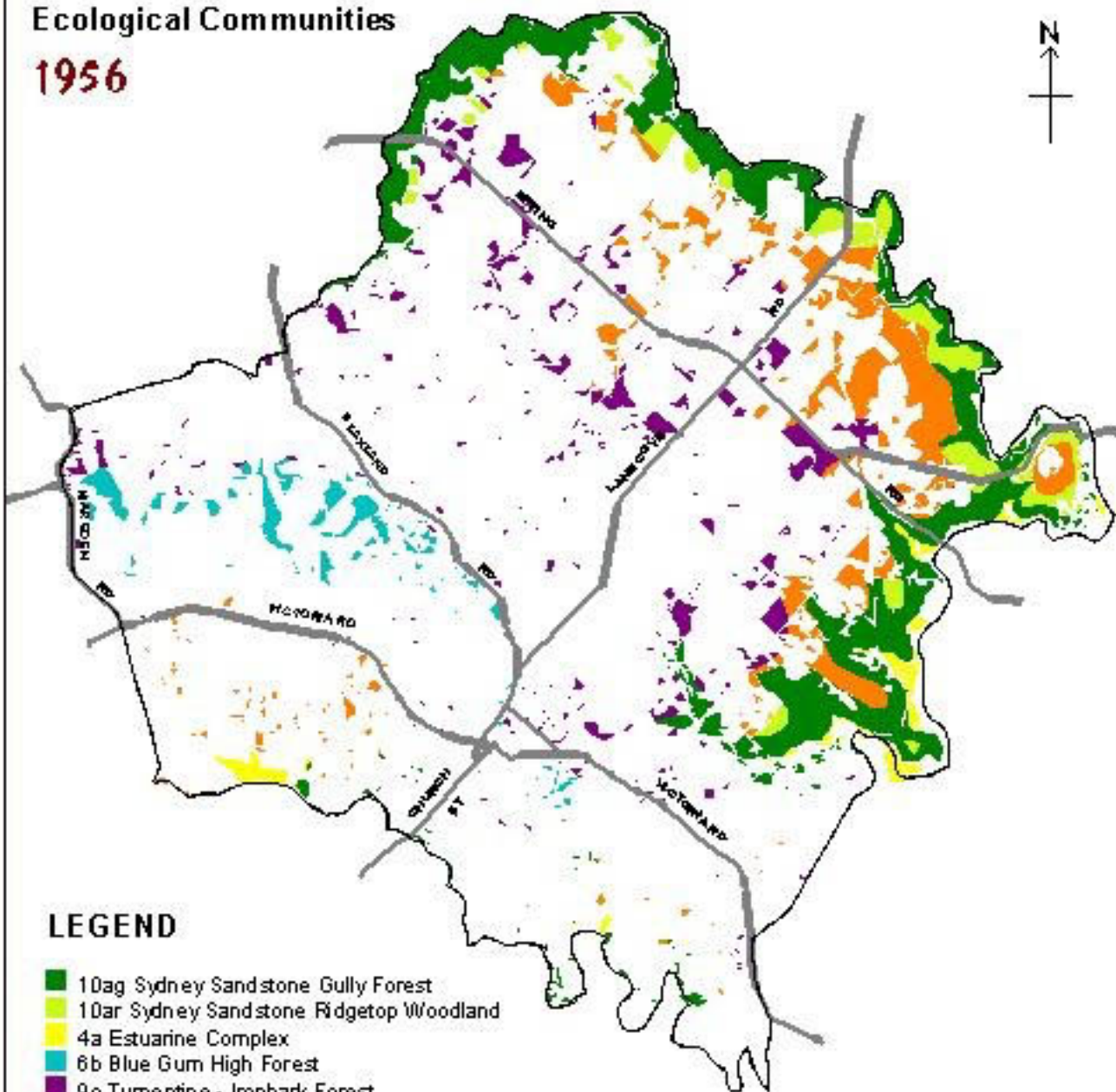
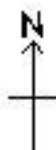
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Ecological Communities

1956



LEGEND

-  10ag Sydney Sandstone Gully Forest
-  10ar Sydney Sandstone Ridgetop Woodland
-  4a Estuarine Complex
-  6b Blue Gum High Forest
-  9o Turpentine - Ironbark Forest
-  TF - Shale/Sandstone Transition Forest

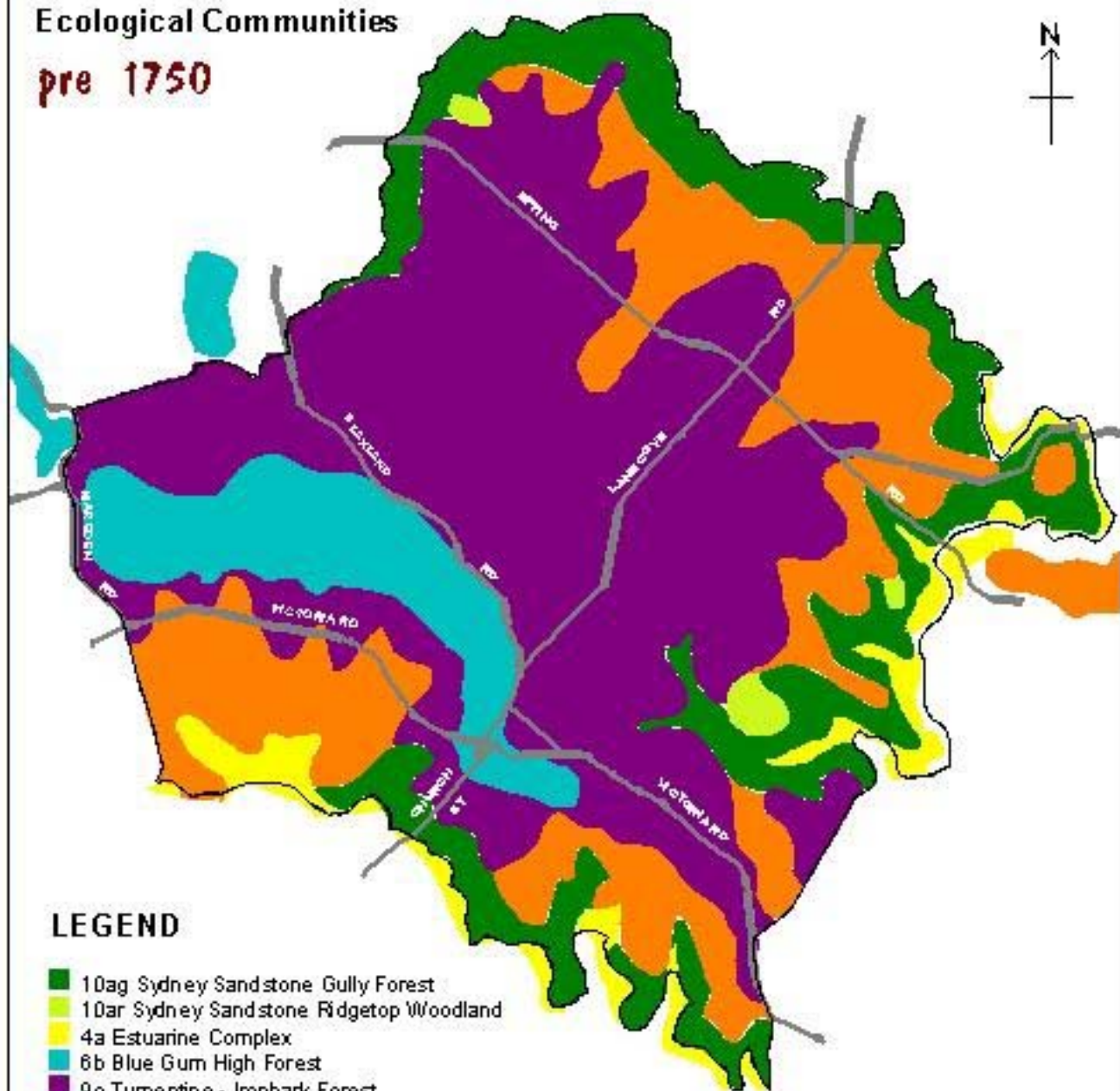
-  City Boundary
-  Arterial Roads

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CITY MANAGEMENT INFORMATION UNIT



Ecological Communities pre 1750



LEGEND

- 10ag Sydney Sandstone Gully Forest
- 10ar Sydney Sandstone Ridgetop Woodland
- 4a Estuarine Complex
- 6b Blue Gum High Forest
- 9o Turpentine - Ironbark Forest
- TF - Shale/Sandstone Transition Forest

- City Boundary
- Arterial Roads

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