City of Ryde

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Ryde Biodiversity Plan

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ecological AUSTRALIA

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Abbreviations

Abbreviation	Description
CEEC	Critically Endangered Ecological Community
CoR	City of Ryde
BEAC	Bushland and Environment Advisory Committee
DCP	Development Control Plan
DPI - Water	NSW Department of Primary Industries – Water
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environment Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESD	Ecologically Sustainable Development
FM Act	*Fisheries Management Act 1995*
GSLLS	Greater Sydney Local Land Services
LEP	Local Environmental Plan
LGA	Local Government Area
NPW Act	NSW *National Parks and Wildlife Act 1974*
NV Act	*Native Vegetation Act 2003*
OEH	NSW Office of Environment and Heritage
PASS	Potential Acid Sulfate Soils
PRCG	Parramatta River Catchment Group
SMCMA	Sydney Metropolitan Catchment Management Authority
TEC	Threatened Ecological Community
TSC Act	NSW *Threatened Species Conservation Act 1995*
VMP	Vegetation Management Plan
WM Act	*Water Management Act 2000*
WoNS	Weeds of National Significance

Executive summary

Biodiversity is the variety of life, from vegetation communities to individual species and the genes they contain. Our quality of life depends on maintaining biodiversity so that ecosystem services such as the availability of fresh water, food, and fuel sources remain. The key is to make our use of biodiversity sustainable, so that the social, economic, environmental and health services provided by healthy ecosystems can continue to provide their benefits for current and future generations.

At the local level, City of Ryde has developed this Biodiversity Plan to help to ensure that local ecosystem health including species and their genetic diversity survive in their natural habitat. The plan's vision is *to assist in the management, enhancement and protection of natural areas and biodiversity in Ryde LGA.* This Biodiversity Plan is designed to act as an overarching framework that sits within the City of Ryde Community Strategic Plan. It is designed to allow future action plans to be created and implemented and help inform Plans of Management for Parks and Reserves. The structure of the document will allow this flexibility and provides the capacity to measure improvement to better target spending need based on conservation priority and feasibility.

For implementation of the action items, the Biodiversity Plan will link with the Four Year Delivery Plan, one year Operational Plan and City of Ryde Project Management System (PMCOR) methodology. Council will have the ability to prioritise budget allocations based on conservation priorities that have been identified.

The plan is based upon five interconnected themes: native vegetation, urban waterways, corridors and connectivity, public spaces and urban habitat. This plan is supported by international, national, state and local policy that drive the development of a biodiversity plan at the local level.

This Biodiversity Plan provides capacity to reinforce regional connections and enhance local corridors. It will allow for regional partnerships and is flexible enough to embrace any future merger of Councils including Ryde along with the harmonisation of systems, processes and procedures.

City of Ryde (CoR) is located within the Cumberland sub-region of the Sydney basin bioregion and occupies most of the land area between the Parramatta and Lane Cove Rivers. The land between the rivers is known as the Hornsby plateau and is dominated by ridges of high ground running east/west. Watercourses have cut through the Wianamatta Shales of the plateau to the underlying Hawkesbury Sandstone (CoR 2013b).

City of Ryde manages 205 hectares of "natural areas" distributed between seventy-one (71) parks and reserves. This plan has identified the values and threats to biodiversity values within Ryde and has identified wildlife corridors on a local and regional scale. These corridors currently provide a degree of connectivity between bushland reserves but also identify potential infill areas that require revegetation to link reserves and improve the degree of connectivity.

A conservation significance assessment of Ryde's bushland reserves was undertaken to prioritise the conservation significance of each. The threats facing these reserves reserve was also determined and ranked. When considered together, the conservation significance and threats at each reserve has determined the management priority for each reserve. Basically, the management priority lists which reserves contain the highest values and threats and are thus a priority for management funding and on ground works.

Biodiversity targets have been listed, so that the actions in this plan can be measured and monitored for successful completion. Each action has been developed based on the literature review, vision and themes of this plan. The actions provide City of Ryde with a well-informed basis for undertaking works to improve, maintain and ultimately enhance the biodiversity values of Ryde.

1 Purpose of the Biodiversity Plan

The Ryde Biodiversity Plan will provide the overarching framework to assist management, enhancement and protection of natural areas and biodiversity in Ryde LGA for the next 5 years. The plan addresses the need for consideration of biodiversity within the context of Council's management and operations by identifying values and issues and presenting strategies and actions that can be undertaken.

2 The Vision

The City of Ryde 2025 Community Strategic Plan outlines seven key outcomes for the city as a response to the clear and consistent priorities from the community. One of these outcomes is "*A City of Environmental Sensitivity*". This Biodiversity Plan is consistent with the communities' vision and outcomes for the city. The vision for this Biodiversity Plan is:

"to assist management, enhancement and protection of natural areas and biodiversity in the Ryde LGA"

This vision for the Ryde Biodiversity Plan is supported by the following five themes, which are all interconnected:

1. **Native Vegetation: protecting and managing Ryde's native vegetation**

Native vegetation provides habitat for plants and animals and is the cornerstone of biodiversity and ecosystem processes across the City of Ryde.

2. **Urban Waterways: restoring waterways and surrounding environments**

Ryde's waterways provide a unique environment and support a range of species, as well as serving as the backbone for connectivity across the LGA.

3. **Corridors and Connectivity: linking the landscape**

Corridors connect larger habitat patches allowing movement of species and/or genetic interchange among native flora and fauna – thereby maintaining biodiversity.

4. **Public Spaces: managing our reserves to promote biodiversity and community interaction**

Public reserves are a focal point for biodiversity management, places of rest and recreation for Council residents, and support the large areas of vegetation in the LGA.

5. **Urban Habitat: protecting and managing biodiversity in the urban landscape**

Biodiversity in an urban environment connects people with nature. As city dwellers, Council and its residents have a responsibility for stewardship of biodiversity, its management and protection.

3 The Value of Biodiversity

Biodiversity is the variety of living things at a number of scales - from vegetation communities, to the species they contain, down to the genetic information contained within each individual.

In recent times, the value of biodiversity has shifted from one perceived to be purely based on an intrinsic value, which cannot be valued in conventional economic terms, to a more defined and quantifiable value. These biodiversity values can be assigned an economic value based on their contribution towards social, economic, and health measures that equate to a greater quality of life.

The World Health Organization has acknowledged that human health ultimately depends upon ecosystem products and services (such as availability of fresh water, food, and fuel sources). It is recognised that biodiversity loss can have significant direct human health impacts if ecosystem services are no longer adequate to meet social needs (WHO, 2012).

A Biodiversity Plan produced at the local LGA level aims to help to ensure that local ecosystem health including species and their genetic diversity survive in their natural habitat. This will ensure that the social, economic, environmental and health services provided by healthy ecosystems can continue to provide their benefits for current and future generations.

4 Plan Framework

4.1 International conventions and treaties

The need for biodiversity planning has its origins in a number of international conventions and treaties that Australia signed in the 1990s. These include:

- *1992 Rio Summit* (United Nations Conference on Environment and Development) which resulted in the following documents:
    - Rio Declaration on Environment and Development
        - highlighted the importance of Ecologically Sustainable Development (ESD)
    - Agenda 21
        - the global blueprint for sustainability
        - Chapter 28 of Agenda 21 identifies local authorities as the sphere of governance closest to the people, and calls upon all local authorities to consult with their communities to develop and implement a local plan for sustainability - a 'Local Agenda 21'
    - Convention on Biological Diversity
        - a legally binding agreement ratified by Australia in 1993. As a signatory nation, Australia is bound to develop and implement strategies that will ensure the conservation and sustainable use of its biological resources.
    - Forest Principles
    - Framework Convention on Climate Change (a legally binding agreement)

- *Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA) and Bonn Convention*.

- provide for co-operation between the Governments of Australia, China and Japan to protect waterbirds that migrate between these countries.

4.2 National Framework

As a result of being a signatory to these treaties and conventions, Australia has taken some significant steps to meet its obligations under these treaties, including the following agreements and strategies:

- *Intergovernmental Agreement on the Environment*
- *Draft National Biodiversity Conservation Strategy 2010-2020*
- *Australia's Biodiversity Conservation Strategy 2010-2030*
- *Australian Weeds Strategy*
- *Australian Pest Animal Strategy*
- *Commonwealth Wetlands Policy*
- *National Water Quality Management Strategy*
- *National Forest Policy Statement*

4.3 NSW Framework

At the state level, the most significant initiative relating to biodiversity protection has been the preparation of the *NSW Biodiversity Strategy 1999-2003.* This strategy recognises the collaborative responsibility of the community, Local and State Governments, and the importance of local planning in biodiversity conservation. It provides guidance to Councils to prepare and implement biodiversity plans.

The *NSW Biodiversity Strategy* has been supported by *Biodiversity Planning Guidelines for Local Government*. This publication was commissioned by NSW National Parks and Wildlife Service and was prepared to assist Councils in implementing the Strategy. It includes guidelines on planning and facilitating biodiversity conservation.

The Draft NSW Biodiversity Strategy 2010-2015 has been prepared by the Department of Environment, Climate Change and Water (DECCW) and Industry and Investment NSW (I&I NSW), and aims to co-ordinate and guide investment and effort in biodiversity conservation in New South Wales. The strategy identifies Local Government as a key contributor and partner for biodiversity conservation in NSW. It also proposes a 100-year vision of minimising the effects of climate change on biodiversity so that ecological change does not equate to loss of diversity.

Other important documents and frameworks at the state-level include:

- *NSW Biodiversity and Climate Change Adaptation Framework*
- *Metropolitan Strategy - Draft Inner North Subregional Strategy*
- *Cumberland Plain Recovery Plan*
- Greater Sydney Local Land Services 2013-2023 transition Catchment Action Plan (CAP)
- *The Sydney Metropolitan Plan*
- NSW State Plan

4.4 Legislative Obligations

The following table summarises the key National and State biodiversity legislation and their implications for City of Ryde.

Table 1: Key Legislation

Act	Summary	Implications for Ryde
The *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act)	Provides a national scheme for environmental protection and biodiversity conservation. Incorporates referral mechanisms and environmental impact assessment processes for projects of national significance. Triggers for referral to the Commonwealth include significant impacts to listed communities and species.	Endangered Ecological Communities (EECs) and Critically Endangered Ecological Communities (CEECs) such as Sydney Turpentine Ironbark Forest, endangered species and JAMBA/CAMBA/ROKAMBA species.
Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act).	The principal planning legislation for the State providing a framework for the overall environmental planning and assessment of development proposals.	Drives the planning and development processes in Ryde. The Act provides for the preparation of a number of environmental planning instruments (including SEPPs and LEPs). SEPP 19 – Bushland in Urban Areas provides a statutory framework for protecting urban bushland and biodiversity within the CoR.
Threatened Species Conservation Act 1995 (NSW) (TSC Act).	This requires that Councils consider the impact on threatened species in fulfilling their statutory responsibilities under the EP&A Act. It also provides for the preparation of Species Recovery Plans that may bind Council to certain actions or activities on Council owned land. *Note: A biodiversity legislation review process is currently underway which will eventually amalgamate the TSC Act into a Biodiversity Conservation Bill (passed through parliament in November 2016).*	Management of threatened species and communities on Council owned lands. Development approvals. Fulfil the actions required under priority action statements and recovery plans.
Protection of the Environment Operations Act 1997 (NSW) (POEO Act)	The POEO Act enables the Government to set out explicit protection of the environment policies (PEPs) and adopt more innovative approaches to reducing pollution through licences and approvals relating to air pollution, water pollution, noise pollution and waste management.	Integration of licensing with the development approval procedures in CoR under the EP&A Act in environmental assessment of activities.

Act	Summary	Implications for Ryde
Local Government Act 1993 (NSW)	Now incorporates Ecologically Sustainable Development (ESD) considerations (including biodiversity conservation) as a key aspect of Council operations. Require the preparation of Plans of Management (POMs) for all Council owned land, and provides for the classification of land into, amongst other things, natural areas and various sub-categories. Additionally, this Act has a range of other provisions that allow for appropriate management of operational land and infrastructure, provide educational services, set rates and charges, issue orders and have a range of enforcement powers.	The Local Government Act is currently subject to review by the State Government under the Fit for the Future reforms.
Local Land Services Act 2013 (NSW)	The Act Provides a framework to ensure the proper management of natural resources in the social, economic and environmental interests of the State	CoR is part of the Greater Sydney Local Land Services (GSLLS). The Greater Sydney LLS State Strategic Plan 2016-2026 sets the vision and goals for Local Land Services for the next ten years and outlines the strategies through which these goals will be achieved. Catchment based targets have been incorporated into this Biodiversity Plan.
National Parks and Wildlife Act 1974 (NSW):	Provides for establishment/management of National Parks and other conservation reserves (for example, through Voluntary Conservation Agreements) and the protection of flora and fauna species	CoR includes Field of Mars Wildlife Refuge and Wallumatta Nature Reserve. Parts of Lane Cove National Park exist along the northern and eastern boundaries of CoR.
Crown Lands Act 1989 (NSW)	The Crown Lands Act 1989 governs the planning, management and use of Crown land, including provisions to reserve or dedicate lands for a prescribed public purpose and for leasing and licensing.	The Department of Primary Industries, together with reserve trusts appointed by the Minister, are responsible for the administration and management of the Crown reserve system. City of Ryde is the reserve trust manager appointed by the Minister to care, control and manage crown lands within the LGA.

Act	Summary	Implications for Ryde
Noxious Weeds Act 1993 (NSW):	Identifies noxious weeds, control measures, public and private responsibilities, and provides a framework for the management of noxious weeds across NSW. *Note: The Biosecurity Act 2015 will come into effect in 2017 and will provide additional effective tools in the management of pests, disease and weeds across all lands*	The CoR has a list of weeds declared noxious within the LGA. Noxious weeds that occur within Council bushland is the responsibility of CoR to control.
Fisheries Management Act 1994 (NSW)	This Act aims to preserve fish stocks, habitats and species and to maintain and promote ecologically sustainable development whilst ensuring the commercial viability of fisheries. It allows for listing of threatened species, habitat, communities, and processes in a similar manner to the TSC Act.	Mangroves, saltmarsh and key fish habitat areas that occur in CoR are protected under this Act.
Water Management Act 2000 (NSW)	This Act controls the extraction of water, how water can be used, the construction of works such as dams and weirs, and the carrying out of activities on or near water sources in NSW	Any works within 40m from the top of bank of a waterway is a controlled activity that requires integrated development approval. Council are exempt from requiring integrated approval.
Rural Fires Act 1997 (NSW)	Established the NSW Rural Fire Service. Controls the fire management practices (eg. Control burning) and development controls in relation to bush fire protection.	Requires Council to prepare a bush fire risk management plan. Requires council to ensure that DA's on bushfire prone land meet specific requirements for bush fire protection.

Act	Summary	Implications for Ryde
Threatened Species Conservation (Biodiversity Banking) Regulation 2008 (NSW)	BioBanking is a voluntary market-based scheme administered by OEH that provides a streamlined biodiversity assessment process for development, a rigorous and credible biodiversity offsetting scheme, as well as an opportunity for landowners to generate income by managing land for conservation.	Council may be able to establish BioBank sites on their own land and generate biodiversity credits to help manage land for biodiversity. This can assist with the ongoing costs for conservation management of the land. Potential BioBank sites could include: • Areas classified as community land (for example, 'natural areas') under the *Local Government Act 1993* (NSW) • Land under environmental protection zoning • Crown land managed by local councils on behalf of reserve trusts under the Crown Lands Act 1989 (NSW) • Land obtained or dedicated to council through development contributions where the land has not been used as an offset

4.1 Local framework

The main policies that control biodiversity protection and management within the CoR are the Ryde Local Environment Plan 2014 (Ryde LEP 2014) and the Development Control Plan (Ryde DCP 2014). These documents determine what land use is permissible in particular locations within the LGA and list what requirements must be met to allow a development to be approved. The sections of the LEP and DCP that address biodiversity protection include the following:

- Clause 3.3 LEP defines an environmentally sensitive area for exempt or complying development'
- Clause 5.9 LEP Preservation of trees or vegetation
- Part 9.5 of the DCP 2014 Tree Preservation

Council plans that relate to biodiversity are listed below. These plans have been reviewed during the preparation of this Biodiversity Plan.

- Numerous separate Plans of Management for council reserves that contain bushland
- Urban Forest Plan 2013
- Urban Forest Technical Manual 2014
- Street Tree Master Plan 2013
- Environment Strategy 2007
- Integrated Open Space Plan 2012

Council programs that encourage biodiversity protection and community involvement include:

- Ryde Environmental Education Network
- Bushcare Volunteer Program
- Bushcare Community Partnership Program (corporate Volunteers)
- Community education, including sustainability workshops
- Home Waste and Sustainability Program
- Guided Walks Program (Active in Ryde)
- The Habitat Community Nursery and Garden
- River to River Corridors Program 2010-2012
- Our Living River Project - as a partner in the Parramatta River Catchment Group

5 Biodiversity of Ryde LGA

5.1 Ryde's Biodiversity in Context

City of Ryde (CoR) is located 12 km from Sydney CBD and is 40 square kilometres in extent. The Lane Cove and Parramatta Rivers form the Southern, Eastern and Northern boundaries of the LGA (CoR 2010). Adjoining LGA's include Parramatta, Hornsby, Ku-ring-gai, Willoughby, Lane Cove and Hunters Hill.

CoR is located within the Cumberland sub-region of the Sydney basin bioregion and occupies most of the land area between the Parramatta River and Lane Cove River. The land between the rivers is known as the Hornsby plateau and is dominated by ridges of high ground running east/west. This area is a geological transition zone where the Hornsby Plateau begins to slope to the southwest to the Cumberland Plain. Watercourses have cut through the Wianamatta Shales of the plateau to the underlying Hawkesbury Sandstone (CoR 2013b).

City of Ryde has 355 ha of open space divided into 197 parks or reserves. Seventy-one (71) of these parks and reserves contain natural areas totalling 205 ha. Thirty (30) of these reserves (63%) have areas within them, that are undergoing bush regeneration works by either paid of volunteer bush regenerators, or a combination of both. In total, there are 57 bush regeneration and bushcare sites totalling 130 ha in extent. The volunteers are managed through the Bushcare Volunteer Program. This information is summarised below in **Table 2**.

Table 2: Summary of natural areas within Ryde LGA

Open space and natural areas within Ryde LGA	Hectares
Open space	355
Natural areas	205
Area subject to active bush regeneration works	130
Reserves and bush regeneration sites	**Number of parks/sites**
Number of parks and reserves	197
Number of parks and reserves with natural areas	71
Percentage of reserves with active bush regeneration works	63%
Number of bush regeneration contract sites	30
Number of Bushcare sites	27

Throughout the LGA, the vast majority of the biodiversity currently exists within the parks and reserves that contain natural areas. These natural areas are valued for their aesthetic, recreational, education and scientific values.

5.2 Vegetation Communities

Under the Sydney Metro CMA Vegetation Mapping SMCMA (OEH 2013), there are 22 different vegetation communities mapped within Ryde LGA. The location of vegetation communities in Ryde is shown in **Figure 1**. **Table 3** lists these communities along with their conservation status and the area of each community mapped within CoR. Vegetation communities that are listed under the Commonwealth EPBC Act and/or the NSW TSC Act are collectively referred to as "Threatened Ecological Communities" or TEC. This group is divided into those communities listed as a Critically Endangered Ecological Community (CEEC) or an Endangered Ecological Communities (EEC). Both levels of conservation significance are present under the TSC Act and EPBC Act. **Appendix F** also provides a summary list of the Reserves within the Ryde LGA that contain TECs.

Table 3. Vegetation Communities within Ryde LGA

Sydney Metro CMA Vegetation mapping 2013	TSC Act	EPBC Act	Area (ha)	Native Vegetation communities mapped within reserves
Blue Gum High Forest	Blue Gum High Forest in the Sydney Basin Bioregion CEEC	Blue Gum High Forest CEEC **	53	Bell Park, Braemar Park, Brush Farm Park, Denistone Park, Dunbar Park, Forrester Park, Jim Walsh Park, Kenneth Park, Lambert Park, Lynn Park, Miriam Park, Outlook Park, Pioneer Park, Portius Park, Symon's Reserve, Yarramar Reserve,
Coastal Enriched Sandstone Dry Forest			80	Lane Cove National Park, Banool Reserve, Barton Reserve, Boobajool Reserve, Brereton Park, ELS Hall Park, Field Of Mars Reserve, Forsyth Park, Kobada Park, Lucknow Park, Martin Reserve, Moore Park, North Ryde Park Nundah Reserve, Pembroke Park, Pidding Park, Portius Park, Pryor Park, Rafferty Reserve, Somerset Park, Tasman Park, Wilga Park, Yurrah Reserve
Coastal Enriched Sandstone Moist Forest			36	Lane Cove National Park, Barton Reserve, Burrows Park, Field Of Mars Reserve, Kittys Creek Reserve, Laurel Park, Pembroke Park, Portius Park, Yinnell Reserve
Coastal Flats Tall Moist Forest			2	Lane Cove National Park
Coastal Sandstone Foreshores Forest			6	Lane Cove National Park, Banool Reserve, Bremner Park, Glades Bay Park, Looking Glass Bay Park, Mallee Reserve, Putney Park,

Sydney Metro CMA Vegetation mapping 2013	TSC Act	EPBC Act	Area (ha)	Native Vegetation communities mapped within reserves
				Tyagarah Park
Coastal Sandstone Gallery Rainforest			14	Lane Cove National Park, Field Of Mars Reserve, Fielder Park, Forrester Park, Forsyth Park, Kittys Creek Reserve, Lucknow Park, Pembroke Park, Portius Park
Coastal Sandstone Gully Forest			127	Lane Cove National Park, Alston Park, Banool Reserve, Fielder Park, Forsyth Park, Ivanhoe Reserve, Kittys Creek Reserve, Kobada Park, Lucknow Park, Magdala Park, Pembroke Park, Portius Park, Quebec Reserve, Somerset Park, Yinnell Reserve
Coastal Sandstone Riparian Forest			1	Lane Cove National Park
Coastal Sandstone Rock Plate Heath			1	Lane Cove National Park
Coastal Shale-Sandstone Forest			32	Lane Cove National Park, Boobajool Reserve, Field Of Mars Reserve, Gwandalan Reserve, Myall Reserve, Nundah Reserve, Tasman Park, Waterloo Park
Coastal Warm Temperate Rainforest			3	Brush Farm Park, Lambert Park
Estuarine Mangrove Forest			18	Lane Cove National Park, Anderson Park Ryde Wharf Reserve, Bill Mitchell Park, Field Of Mars Reserve, Glades Bay Park, Helene Park, Kissing Point Park, Koonadan Reserve, Korpie Reserve, Looking Glass Bay Park, Magdala Park, Melrose Park, Memorial Park, Settlers Park

Sydney Metro CMA Vegetation mapping 2013	TSC Act	EPBC Act	Area (ha)	Native Vegetation communities mapped within reserves
Estuarine Reedland			2	Lane Cove National Park, Field of Mars Reserve
Estuarine Saltmarsh	Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions EEC		1	Lane Cove National Park, Field of Mars, Glades Bay Park, Koonadan Reserve, Korpie Reserve, Looking Glass Bay Park, Melrose Park, Settlers Park
Estuarine Swamp Oak Forest	Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions EEC		7	Lane Cove National Park, Banool Reserve, Field of Mars, Settlers Park
Hornsby Enriched Sandstone Exposed Woodland			66	Lane Cove National Park, Christie Park, Fielder Park, Somerset Park, Waterloo Park
Plantations			1	
Riverflat Paperbark Swamp Forest	Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions EEC		<1	Lane Cove National Park
Sydney Foreshores Shale Forest	*		1	Memorial Park
Sydney Turpentine-Ironbark Forest	Sydney Turpentine-Ironbark Forest CEEC	Turpentine-Ironbark Forest in the Sydney Basin Bioregion CEEC	38	Aitchandar park, Barton Park, Booth Reserve, Brush Farm Park, Bundara Reserve, Burrows Park, ELS Hall, Field of Mars Reserve, Forrester Park, Forsyth Park, Greenwood Park, Hubert Hunt Reserve, Marsfield Park, Minga Rerserve, Portius Park, Pryor Park, Stewart

Sydney Metro CMA Vegetation mapping 2013	TSC Act	EPBC Act	Area (ha)	Native Vegetation communities mapped within reserves
				Park, Tyrell Park, Wallumatta Nature Reserve, Ryde Park,
Urban Native and Exotic Cover			473	
Total			**963**	

* While this community is not listed under the TSC Act or EPBC Act, the total community covers less than 190 ha in the metropolitan area and possibly occurs nowhere else in this form. Based on this, its conservation significance must be very high, probably sufficient for it to be proposed as an EEC, warranting the same conservation significance (Thomas, pers.com. 2015)

** Under the EPBC Act, STIF and BGHF must meet certain size and condition criteria.

The vegetation communities of highest conservation value and thus of highest management priority are those listed as critically endangered under the EPBC Act, which include Blue Gum High Forest and Sydney Turpentine Ironbark Forest. However, the EPBC Act only protects the best examples of these communities, with certain size and condition classes that must be met. Blue Gum High Forest is also listed as critically endangered under the TSC Act, however, there are no criteria required and even single trees that are characteristic of this community are considered to be part of the CEEC.

Endangered ecological communities listed under the TSC Act and also of high conservation significance and include Sydney Turpentine Ironbark Forest, Coastal Saltmarsh, Swamp Oak Floodplain Forest and Swamp Sclerophyll Forest. While not listed as an EEC, the community Sydney Foreshores Shale Forest, which occurs to west of the railway line along the Meadowbank foreshore, covers less than 190 ha in the entire metropolitan area and possibly occurs nowhere else in this form. Based on this, its conservation significance warrants the same local protection as an EEC (Thomas, pers.com. 2015).

The SMCMA vegetation mapping has not been ground-truthed as part of the preparation of the plan and a number of discrepancies may occur. For example, less than 1 hectare of Swamp Sclerophyll Forest on Coastal Floodplains EEC is mapped by the SMCMA and it is debatable whether this community meets the definition under the TSC Act, and therefore exists with CoR.

The presence of Blue Gum High Forest within CoR is also under debate, with some literature suggesting that such areas should be mapped as Sydney Turpentine Ironbark Forest, as discussed below.

Regardless of whether this vegetation is considered to be Blue Gum High Forest or Sydney Turpentine Ironbark Forest, both vegetation communities are of high conservation significance and are given the highest priority for retention and improvement.

- CoR current knowledge of vegetation communities is based on the 2001 study by Oculus, which includes Blue Gum High Forest.
- Kubiak 2005 notes the presence of Blue Gum High Forest within CoR.
- Biosphere (2008) reclassify areas previously mapped by Oculus (1999) as Blue Gum High Forest to Sydney Turpentine Ironbark Forest or Sydney Turpentine Ironbark Margin Forest. The locations of these patches include Brush Farm Park, Darvall Park, Denistone Park, ELS Hall Park, Flinders Park, Lynn Park, Miriam Park and Shrimptons Creek Parklands.
- The NSW TSC Act Final Determination for Blue Gum High Forest states that the community occurs within Ryde LGA (OEH 2011).

Flora and Fauna surveys planned for 2016-2018 should help to clarify the locations of Blue Gum High Forest and Turpentine Ironbark Forest communities.

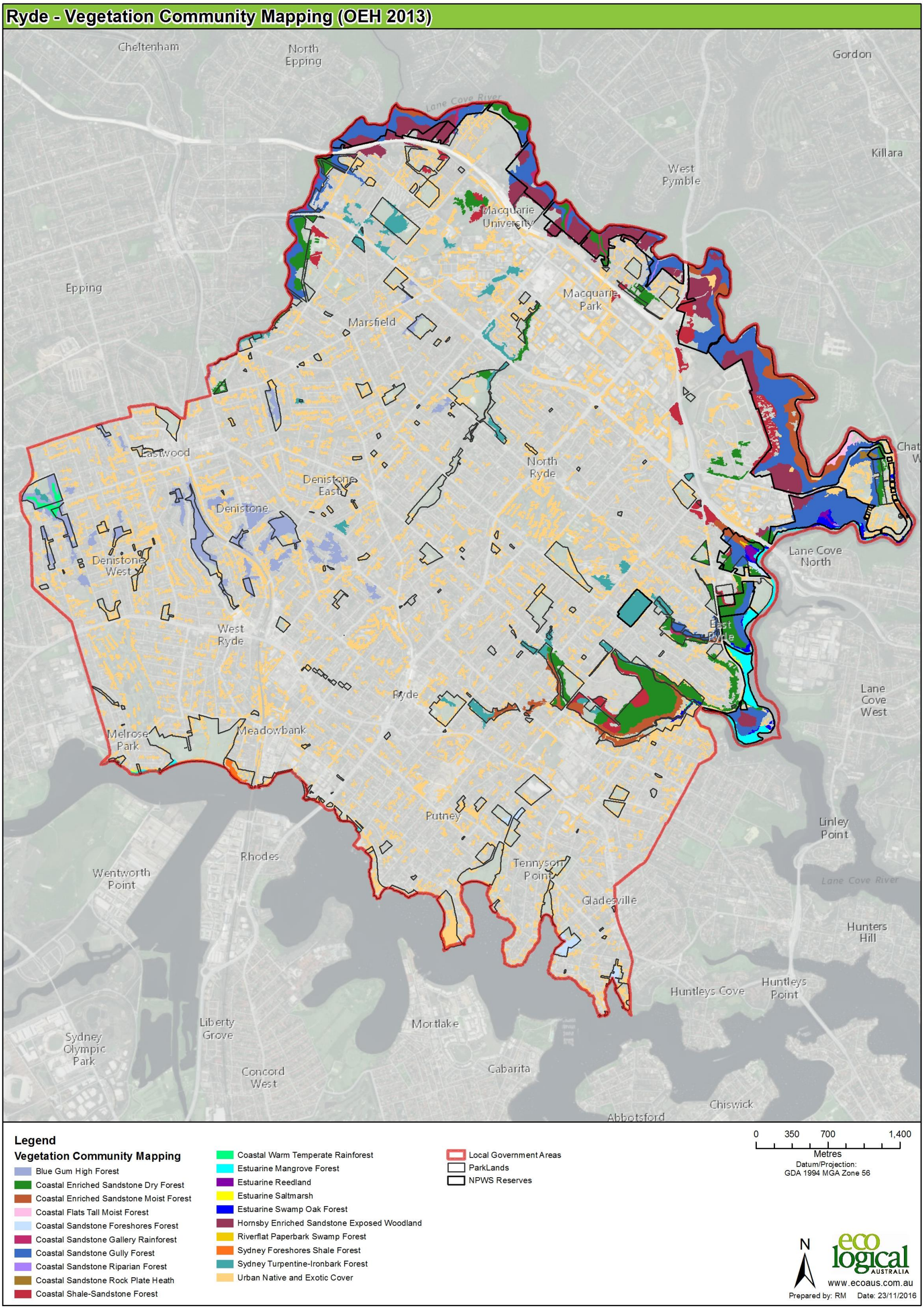

Figure 1: Vegetation communities within Ryde LGA as mapped by OEH 2013.

5.3 Flora

A number of vegetation surveys have been undertaken within CoR including Kubiak (2005), Oculus (2001) and Biosphere (2006, 2007 and 2008). Kubiak stated that at least 570 species of native plants have been recorded in Ryde's bushland, which includes Lane Cove National Park and Wallumatta Nature Reserve, as well as bushland reserves managed by the City of Ryde.

5.3.1 Rare and Threatened Flora

Of the 570 species recorded by Kubiak (2005) nine species were listed as threatened and a further 53 were considered rare (Kubiak 2005). Kubiak also notes that at least 19 of Ryde's native plant species may now be locally extinct within the Ryde district. These include *Genoplesium baueri* (which may still be present in the area, but could go undetected due to their cryptic nature), the orchid *Diuris bracteata* and *Persoonia hirsuta*.

Some native species may have disappeared from Ryde's bushland before they were be recorded. For example, *Dendrobium speciosum* (Rock Lily) probably would have occurred in the Ryde district prior to European settlement, but does not appear to occur in Ryde. In addition, a number of Ryde's plant species have declined so dramatically that they are now on the brink of local extinction, including *Pultenaea scabra* var. *biloba* and *Lissanthe trigosa* subsp. *strigose* (Kubiak 2005). Other species, such as *Celastrus subspicatus*, recorded in Brush Farm Park and Darvall Park is considered rare in the Ryde area.

As part of the preparation of this Plan, a search of the NSW Wildlife Atlas (via Bionet website (http://www.bionet.nsw.gov.au/) was undertaken to determine the location of threatened plants in CoR. The results are listed in **Appendix B** and include 13 threatened species listed under the TSC Act or EPBC Act (or both) and whether the species was recorded within a CoR reserve.

Of the threatened species recorded, only five species are recorded within CoR reserves and one of these is presumed extinct (*Prostanthera mariflora* has been previously recorded in Laurel Park). *Epacris purpurescens* var. *purpurescens* and *Pimelea curviflora* var. *curviflora* have been recorded at Field of Mars and *Melaleuca deanii* was recorded at Somerset Park (Biosphere 2007). *Wilsonia backhousei* has been recorded at Kissing Point Park and Bell Park. This species has also been recorded by Biosphere (2008) on one of the sandstone benches bordering the river at Looking Glass Bay, near the boundary with Banjo Patterson Park. Kubiak (2005) also noted a population of *Wilsonia backhousei* at Melrose Park.

Based on the findings of Kubiak (2005), rare plants and their location within CoR reserves are listed in **Appendix B**. Given that this study was undertaken 10 years previous, some of these species may not be still present at these locations.

5.4 Fauna

Fauna surveys within Ryde LGA have been previously undertaken by Biosphere (2006, 2007 and 2008) and by Insight Ecology (2010 – 2012) as part of the monitoring of the River to River Corridor project. Fauna sightings have also been recorded by contractors during bush regeneration activities.

Ryde is typical of most highly urbanised LGA's within Sydney that have seen a pattern of biodiversity loss over time. In particular, large terrestrial mammals (eg. Long-nosed Bandicoot, native rodents and wombats), and large reptiles (bearded dragons and goannas) have become extremely scarce or locally extinct. The only remaining native terrestrial mammals are Long-nosed bandicoots in Tasman Park and

Echidnas, Bush Rat and Brown Antechinus in the Field of Mars Reserve (CoR 2010). However, there have been numerous sightings of a swamp wallaby at Field of Mars Reserve and Kittys Creek Reserve (S. Payne pers. comm. 2016).

Arboreal mammals are still relatively common with Ring-tailed Possum, Brush-tailed Possum and Sugar Gliders known from Field of Mars, Lucknow Park and Pembroke Park (Biosphere 2008).

The total number of bird species recorded in Ryde since 1802 as collated by Insight Ecology (2010) was 221 species. Of these, 103 are native bushland and saltmarsh dependent birds. At present, 20% of these species are locally extinct (6 species) or are likely to have become extinct (15 species).

Eastern Barn Owl, Eastern Bristlebird, White-fronted Chat and Spotted Quail-thrush became locally extinct during earlier phases of habitat loss. Later local extinctions occurred between the 1960's and early 1990's and included Superb Lyrebird, Rockwarbler, Noisy Pitta, Pheasant Coucal, Speckled Warbler, Yellow-tufted Honeyeater, Diamond Firetail and Little Grassbird. More recent extinctions need to be confirmed but are likely for the Chrested Shrike-tit, Varied Sittella and the Clamorous Reed Warbler (Insight Ecology 2010). However, a Crested Shrike-tit was observed along Terrys Creek in 2013 (S. Payne pers. comm. 2016).

Bird species richness has also declined, in particular the small passerine (perching) birds that require mid-canopy cover. Meanwhile, other birds have exploited human environments and are increasing in numbers. These birds tend to be aggressive and include Noisy Miners, Rainbow Lorikeets, Australian Raven, Pied Currawong and Common Myna (Biosphere 2008).

In smaller more isolated reserves, species such as Sacred Kingfisher, Rufous Whistler, Brown Thornbill, Grey Fantail, White-browed Scrubwren, Eastern Whipbird and Eastern Yellow Robin appear to be struggling to maintain their small and presumably 'at-risk' populations (Insight Ecology 2010).

Birds currently in serious decline are the remnant-dependent, sedentary and often ground- or shrub-foraging bird species, even in larger remnants (eg, Field of Mars) that are connected to the Lane Cove River valley system. These include Common Bronzewing, Wonga Pigeon, Grey Shrike-thrush, Whitethroated Treecreeper, Eastern Whipbird, Eastern Yellow Robin, Golden Whistler and Striated Thornbill (Insight Ecology 2010).

Frogs have also declined due to loss of ephemeral flooded areas and creek catchment habitat, poor water quality and the introduced fish species Plague Minnow (*Gambusia holbrooki*). Most tree frogs have disappeared due to lack of breeding habitat. Frog species recorded during the 2006-2008 Flora and Fauna Studies (Biosphere) included *Crinia signifera* Common Eastern Froglet, *Limnodynastes peronii* Striped Marsh frog, *Limnodynastes dumerilli* Eastern Banjo Frog, *Litoria phyllochroa* Leaf-green Tree Frog and *Litoria peronii* Peron's Tree Frog. The uncommon frog *Litoria phyllochroa* was recorded in Brush Farm Park and Field of Mars (Biosphere 2008).

5.4.1 Rare and Threatened Fauna

A search NSW Wildlife Atlas using Bionet website (http://www.bionet.nsw.gov.au/) for threatened fauna recorded in the Ryde LGA resulted in a total of 75 threatened fauna species. However, when the search was reduced to records post-1980, only 16 species were present and post 1990 – only 13 species. This reflects the marked decline of fauna species recorded over time within Ryde LGA. The list of threatened fauna species recorded post 1980 is shown in **Appendix D**. This list demonstrates that only a small number of threatened fauna species are likely to occur within Ryde LGA, as some species were only recorded once during the last 35 years and have no recent records.

One threatened species that appears to be expanding their urban population in Sydney is the Powerful Owl. Powerful Owl has been recorded in several CoR reserves including Brush Farm Park, Forsyth Park, Lucknow Par, Marsfield Park, Pembroke Park and Field of Mars (Biosphere 2007 and 2006). Mostly, Powerful Owl would use these reserves for foraging, however roosting has been recorded at Field of Mars (Biosphere 2006). The Lane Cove River provides key roosting, nesting and foraging habitat for Powerful Owl (Insight Ecology 2011). Such individuals are likely to nest in the Lane Cove Valley and forage throughout Ryde's bushland areas on small mammals including possums.

5.5 Wildlife Corridors

The most functional wildlife corridor within the Ryde LGA occurs along the Lane Cove River, where vegetation comprising Lane Cove National Park forms a corridor connecting to the riparian habitats of the Parramatta River. However, within the majority of Ryde LGA, the connectivity of bushland areas is discontinuous and interrupted by roads and developed areas. Given this urban matrix, only highly mobile fauna and widely-dispersing native flora species can utilise such corridors. Cover-dependent fauna and flora species with limited seed dispersal tend to become locally extinct in the urban environment. Wherever possible, improving the width and connectivity of the corridors identified below will benefit fauna movements and native flora dispersal.

5.5.1 Previous wildlife corridor studies

Fox and Rawling (1990)

This study highlighted Ryde district's geographical importance as a conduit for regional-scale fauna movement. This study proposed that fauna could move along Terrys Creek and Lane Cove River down to Field of Mars, and west to Denistone, Darvall and Brush Farm Parks then onto Galaringi Reserve in the upper Dundas valley and remnants further west and north-west. Locally, this study mapped a northwest corridor from Field of Mars to Wallumatta Nature Reserve, North Ryde Common, North Ryde Golf Course, Shrimptons Creek and onto Macquarie University.

DECC 2008

In 2008, DECC completed a rapid fauna habitat assessment of the Sydney Metropolitan CMA area. The fauna habitat value of 50 sites across Sydney was assessed and ranked according to 10 key habitat components. The Lane Cove Valley ranked among the "very high" group of sites. However, the fauna habitat value of smaller (less than 50 ha in area) patches of remnant vegetation was not investigated.

River to River (R2R) Corridor project

The River to River (R2R) Corridor project was a 3 year project between Hunters Hills and CoR which aimed to enhance wildlife corridors between the Lane Cove River and Parramatta River. In particular, the project aimed to enhance over 9 kms of identified corridors through revegetation at 25 sites. Over 900 community members, schools and volunteers planted over 1600 plants. The focus was on restoration of small native bird and fauna habitat. The project ran from 2010 to 2012.

Insight Ecology 2010 to 2012

Insight Ecology conducted monitoring from 2010 to 2012 to determine the effectiveness of the R2R project. Insight Ecology (2011) found that within the study area and its environs, most habitat of value to indigenous, cover-dependent avifauna and other taxa occurred along the Lane Cove River and its key tributaries – primarily Terrys and Buffalo Creeks and secondarily, Shrimptons and Kittys Creeks. The degree of habitat connectivity was found to be quite high between these arterial streams and Lane Cove River itself.

Some residual landscape connectivity exists across Hunters Hill, Ryde and Parramatta LGAs from Field of Mars Reserve along Buffalo Creek to Brush Farm Park via small partly vegetated reserves in upper Terrys Creek catchment, Denistone Park and Darvall Park, and then onto Dundas Valley remnants at Galaringi Reserve and Coxs Creek. However, these are only able to offer breeding and refugia resources for a small subset of isolation-sensitive bushland bird species. Thus, these patches have low functional connectivity for bushland birds in the landscape (Insight Ecology 2011).

Apart from the three key bushland reserves (Lane Cove NP, Field of Mars Reserve, and Boronia Park (Hunters Hill LGA)), all of the remnants identified in the R2R project are small, narrow, and have a consequently high edge-to-area ratio. This limits the range of habitat types, degree of structural habitat complexity, and food and nesting resources they can offer to woodland and forest bird species. Only the more resilient and adaptable species such as Noisy Miner, Common Myna (introduced), and Rainbow Lorikeet are usually found in these patches (Insight Ecology 2011).

City of Ryde Studies

The CoR Street Tree Master Plan (2013) mapped proposed habitat corridors and roads with high and low planting initiators. The City of Ryde Urban Forest Plan (2013) suggests supplementing and supporting connectivity of bushland reserves with street planting and encouraging residents to plant habitat trees and shrubs.

5.5.2 Regional Corridors

Figure 2 shows the local and regional connectivity, which is based on a review of previous studies and desktop mapping analysis. The regional biodiversity connectivity occurs along the Lane Cove and Parramatta Rivers with the following five regional connections extending from the Lane Cove River:

1. **Terry's Creek Corridor**: Somerset Park - Ivanhoe Park - Lucknow Park and Pembroke Park
2. **Kittys Creek Corridor**: Kittys Creek Reserve – Portius Park – Pryor Park - Wallamatta Nature Reserve – North Ryde Common and North Ryde Golf Course
3. **Buffalo Creek Corridor**: Field of Mars – Laurel Park – Burrows Park
4. Corridor extending from the Dundas Valley near the western boundary of the LGA to Brush Farm Park – Lambert Park – Lynn Park – West Denistone Park – Darvall Park – Symon's Reserve – Denistone Park.
5. **Parramatta River**: Morrison Bay Park – Tyagarah Park – Mallee Park – Olympic Park – Pidding Park – Barton Park – Aitchandar Park – Minga Reserve

5.5.3 Local Corridors

Seven local connections are mapped within Ryde LGA (**Figure 2**). Of these, two are connected with the regional Parramatta River corridor as follows:

1. Meadowbank Park – Ryde Parramatta Golf Club – Maze Park
2. Meadowbank Park – West Ryde

Five local connections extend from the Lane Cove River regional corridor and include:

3. Waterloo Park – Trafalgar Reserve – Marsfield Park
4. Though the grounds of the Macquarie University along Mars Creek to Pioneer Park
5. Though the grounds of the Macquarie University along Kikkiya Creek
6. Strangers Creek – Through Field of Mars Reserve to North Ryde Common
7. Pages Creek – Blenheim Park – Bundara Reserve

A local connection in the centre of the LGA consists of:

8. Shrimptons Creek Corridor: Elouera Reserve – Wilga Park – Quandong Reserve – Booth Reserve - ELS Hall Park – Greenwood Park – Tindarra Reserve – Flinders Park – Santa Rosa Park.

A local connection extends from the Terry's Creek regional corridor and includes:

9. Forsyth Park - Forrester Park - Yarramar Reserve and Jim Walsh Park.

5.5.4 Opportunities for Connectivity

Figure 2 identifies a number of opportunities where habitat enhancement of streetscapes and existing bushland areas may support improved connectivity between local corridors and regional corridors across Ryde. The primary role for these areas of opportunity would be to enhance a series of stepping stones between corridors for the more mobile fauna species. Any enhancement of these areas should be carried out in line with the City of Ryde Urban Forest Plan (2013).

A review of the priority rankings in the Street Tree Masterplan (as well as Council's Park Tree Planting Program) to focus on the areas of opportunity in **Figure 2** will assist in strengthening ecological connections across the City of Ryde.

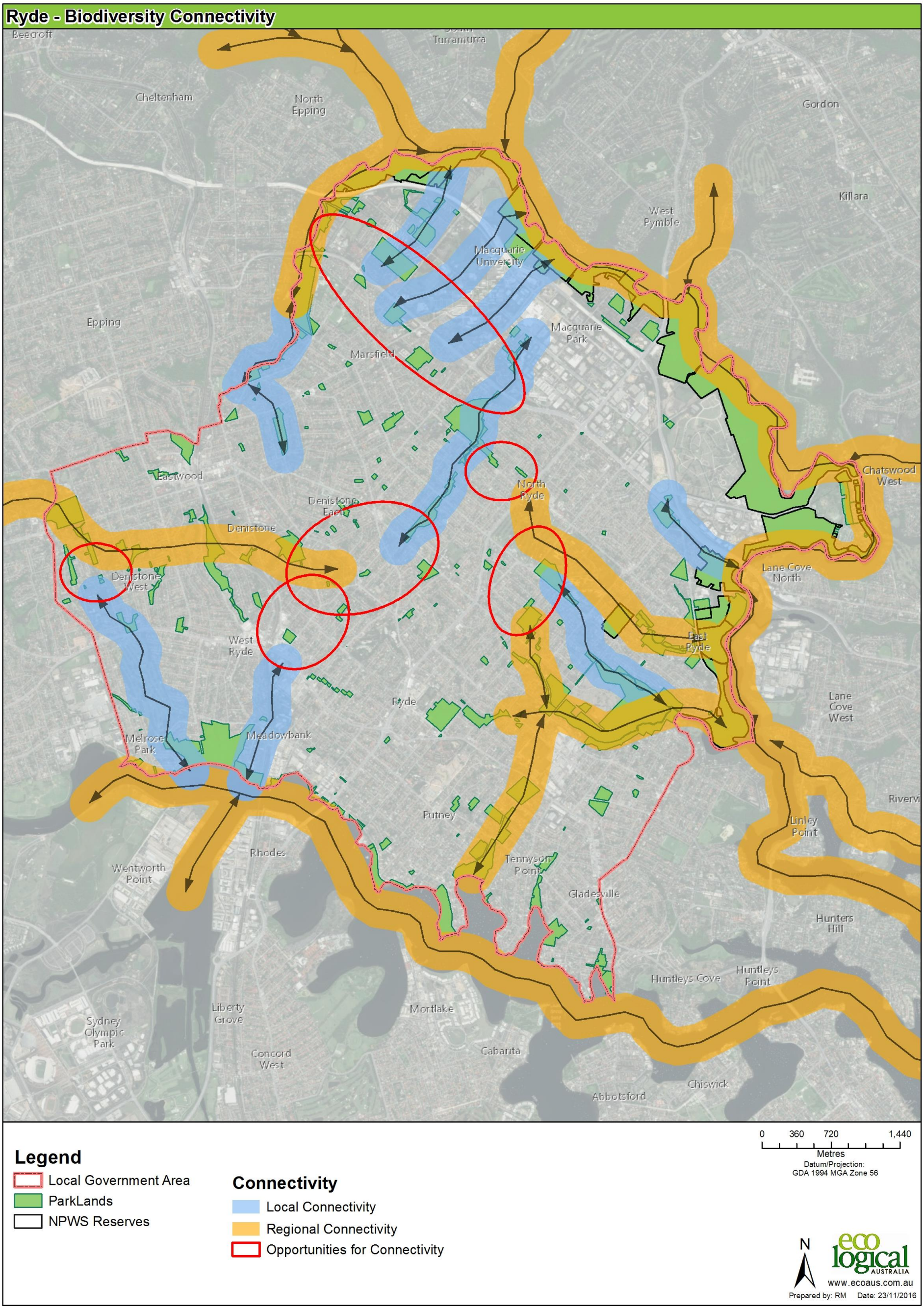

Figure 2: Connectivity within City of Ryde

6 Threats

The Biodiversity values of Ryde LGA are threatened by factors typical of urban areas. Primarily, the loss of habitat through clearing for infrastructure and urban development presents the most direct threat through loss of habitat and extent of native vegetation. Other threats to Ryde's biodiversity are discussed below from a review of literature, including previous ecological studies, bush regeneration activity reports and CoR Plans of Management.

6.1 Edge effects

Most of the native vegetation within Ryde is located along creek lines and drainage reserves. The long linear shape of these reserves creates a high edge to size ratio, so that edge effects including weed invasion penetrate through the entire reserve. In contrast, large areas of vegetation like that found at Field of Mars Reserve contain a core of vegetation that is buffered from impacts by surrounding vegetation. As such, the native species richness of most reserves in Ryde is currently threatened by edge effects including weed invasion, rubbish dumping and disturbance by activities such as illegal track construction (Kubiak 2005).

An edge effect that is less known is artificial lighting and the impacts on fauna. Biosphere (2007) noted that a single back yard spotlight can dislocate fauna for 50 metres either side of the light source. This can effectively reduce the area of habitat for some native fauna. The large bright lights at sporting fields are likely to have to cause an impact to adjacent bushland given the height and intensity of the light.

6.2 Increased runoff and nutrients

The relatively large area of impermeable surfaces found in urban areas like Ryde including roads, car parks and developed areas increases the amount of stormwater runoff entering creeks and drainage lines. This runoff also contains a relatively high amount of nutrient that changes the soil nutrient levels of urban bushland and favours the growth of exotic species. So, in addition to weed invasion from the edges of reserve, the presence a drainage line within the centre of many of Ryde's reserves provides another source of nutrient and weeds including "garden escapes" from residential areas.

6.3 Lack of fire

The lack of fire within urban bushland also changes to the species composition towards that of a mesic (moist rainforest-like) forest instead of fire-adapted sclerophyllous vegetation, which is generally typical of the native vegetation along ridges and plateaus within Ryde. Species diversity generally declines with increasing time since fire in sclerophyllous native vegetation, as mesic natives (eg. *Pittosporum undulatum*) and exotic fire sensitive weeds become dominant. Some locations and plant communities may have been rarely been burnt. The occurrence and diversity of some long-lived fire-sensitive species is probably an indication that fire had little impact in some areas.

Environmental burns can assist with regenerating urban bushland. For example, Biosphere (2008) noted that Tasman Park, which is a linear shaped reserve (300m long x 50m wide) and therefore vulnerable to edge effects had exceptional species diversity (119 species), possibly due to previous fire. At the time of the Biosphere survey (2008), a recent burn had occurred within the reserve and there was a monoculture of native Hop Bush (*Dodonaea* triquetra) sheltering uncommon plants such as *Pultenaea linophylla* and *Daviesia ulicifolia* ssp *ulicifolia* both listed as rare in the Ryde by Kubiak (2005).

Pultenaea linophylla was not observed in any other reserves during the 3 year survey period (Biosphere 2008).

On the contrary, areas of bushland that are burnt too frequently will result in the loss of native species richness, particularly from obligate seeders. Obligate seeders are plants which do not re-sprout following fire, but regenerate from seeds buried in the soil or retained in woody fruit. The fire-interval must be long enough to allow such plants to grow, reproduce to produce a seed bank.

6.4 Weed invasion

CoR are legally obligated to control noxious weeds within Council reserves. Noxious Weeds that threaten vegetation communities within Ryde include (Biosphere 2008):

- Class 4: *Lantana camara* (Lantana), *Asparagus* sp. (Asparagus Fern), *Rubus fruticosus* species aggregate *(*Blackberry), *Ligustrum sinense* (Small-leaved Privet) and *Ligustrum lucidum* (Large-leaved Privet), and *Olea europaea* subsp. *cuspidata* (African Olive)
- Class 3: *Cestrum* parqui (Green Cestrum), *Genista monspessulana* (Cape Broom), *Alternanthera philoxeroides* (Alligator weed).

Weedy vines including *Anredera cordifolia* (Madeira Vine), *Ipomea* sp. (Morning Glory), *Passiflora suberosa* (Corky Passionfruit), *Lonicera japonica* (Japanese Honeysuckle) and *Cardiospermum grandiflorum* (Balloon Vine) can if not managed, smother the canopy and cause dieback of native trees (eg. Lynn Park, Symons Reserve, Denistone Park) (Biosphere 2008). Some herbaceous weeds such as *Tradescantia fluminensis* (Wandering Trad) have the potential to quickly replace native ground covers and can be difficult to eradicate.

While weeds are a threat to Ryde's biodiversity, a staged approach to weed control to best to avoid adverse impacts. For example, the over-clearing of woody weeds can promote erosion on steep slopes and the value of lantana, blackberry, privet and other exotic plants as habitats for fauna needs to be considered. Small isolated but breeding populations of Variegated Fairy-wren, Superb Fairy-wren and Whitebrowed Scrubwren have been recorded in Mallee Reserve and Field of Mars Reserve (Insight Ecology 2011) utilising the dense cover provided by such weeds. These areas should be preserved as habitat where possible until appropriate native habitat structure is available nearby.

The Saltmarsh community EEC at Field of Marks is threatened by *Salpichroa origanifolia* which spreads via rhizomes and is very difficult to remove. The saltmarsh community along the Parramatta River is also threatened by mangrove incursions. A comparison of 1943 and 2008 aerial photos (Dept of Lands) shows that most of the mangrove communities mapped in the 2008 survey by Biosphere have increased significantly since 1943. The only exception was Morrison Bay Park where the saltmarsh area had been reclaimed after construction of a seawall (Biosphere 2008).

Other weeds that threaten the Saltmarsh EEC are *Juncus acutus* ssp. *accutus, Phragmites australis* and Alligator Weed. The latter two species are indicative of freshwater entering the saltmarsh from culverts (Eg. Settlers Park) (Biosphere 2006).

6.5 Dumping and recreational impacts

Ryde's bushland is currently threatened by rubbish dumping, disposal of garden clippings and disturbance by activities such as illegal track construction (Kubiak 2005). In particular, unmanaged recreational use has been identified degrading the following reserves (Biosphere 2006, 2008).

- Denistone Park, Darvall Park and Field of Mars from bicycle tracks.

- Darvall Park from Pedestrian traffic;
- Marsfield Park from increased nutrient load from horse manure.

6.6 Domestic pets and introduced fauna

Predation by cats, dogs and foxes is the main reason for the decline of terrestrial mammals from Ryde, such as the Long-nosed Bandicoot (Biosphere 2008). Large reptiles including blue-tongue lizards, bearded dragons, goannas and large snakes have become very scarce mostly by deliberate and accidental killing by humans or domestic animals. The lack of vegetative cover and habitat in the form of fallen timber and rocks and the small size of reserves makes terrestrial mammals and large reptile species more vulnerable to predation.

Rabbits have been identified as causing soil degradation and feeding on recent revegetation works at Marsfield, Pembroke and Pidding Park (Biosphere 2008).

Four introduced bird species are present within Ryde, including the ground-foraging granivores Spotted Dove and Rock Dove, and the omnivores Common Myna and Common Starling. These species are generally exploiting human environments including planted vegetation along streets and parks and in front and rear yards (Insight Ecology 2011).

6.7 Development and infrastructure

Development and infrastructure works in parks or reserves can impact native vegetation communities through clearing and disturbance. Typical works include maintenance of existing infrastructure, including pathways, adjoining recreational facilities, underground services, powerlines, adjoining roads and stormwater. Similarly, developments occurring on adjoining properties or upstream from parks and reserves can have negative impacts. Poor site management and inadequate sediment controls can lead to waste material impinging on the reserves as well as increased stormwater, erosion and sediment load.

7 Conservation Significance Assessment

A conservation significance assessment is a process of ranking the bushland areas of Ryde to determine which have the most important biodiversity features/values. This process is described below and helps to identify and prioritise which reserves require protection and management.

7.1 Purpose of the Conservation Significance Assessment

The prioritisation process is based on the measurement and comparison of a number of criteria that contribute to the biodiversity conservation value of areas of bushland in Ryde:

- the values of the bushland area within a landscape context;
- community values for bushland areas; and
- threats impacting on the bushland area.

The criteria were initially developed and reviewed by Council and then further refined to provide a transparent, repeatable process. The following broad groups were considered suitable for the criteria.

- **Conservation values** – threatened biota, legislative status, vegetation cover;
- **Landscape values** – size and connectivity;
- **Community values** – community usage and feedback; and
- **Threats** – surrounding land use, potential disturbance, climate change impacts.

Each criterion was given a numeric score reflecting the level that it contributes to the assigned value. The total scores are then calculated and ranked to provide an overall prioritisation value for the area of bushland.

7.2 Assessment Criteria

The biodiversity conservation significance criteria include conservation, landscape and community values using available associated data. The following available information was used in the process:

- City of Ryde Vegetation Mapping (mapped by OEH 2013)
- Atlas of NSW Wildlife database
- Parramatta River Catchment Group Fauna species database
- Riparian areas and Buffers
- Habitat corridors
- Drainage catchments
- Council Park Boundaries
- Anecdotal community feedback
- Council assets database

The criteria assessed and scored for each bushland patch using the above datasets via a desktop GIS process using geo-processing, data filtering and reporting operations. The assessment criteria and available score for each criterion are defined in **Table 4**.

Table 4: The assessment criteria used to determine biodiversity conservation significance of bushland within CoR

Major Values	Criteria	Supporting Information Measure	Score
Conservation	Threatened or rare biodiversity (CoR1)	Vegetation mapping Atlas of NSW Wildlife Council database	Threatened Ecological Community (Federal, State) or Presence of threatened Biota / Presence of locally rare flora and fauna Present = 1
Landscape	Associated Vegetation Patch Size (CoR2)	Vegetation mapping GIS analysis	Patch of Natural area > 1 ha Present = 1
	Connectivity / Corridors (CoR3)	Riparian buffers Habitat corridors Catchment boundaries GIS analysis	Proximity to surrounding natural areas and or National Park, or Location within a identified habitat corridor or Location within Parramatta and Lane Cove R catchment & Riparian Zone Presence of a minimum of 2 of the above = 1
Community	Community Value (CoR4)	Park boundaries Community feedback and assets register	Identified Valued area = 1

The resultant score for each bushland patch is calculated and the value ranking of biodiversity significance is based on the following total scores:

- High: 4
- Moderate: 2 - 3
- Low: 0 – 1

7.3 Conservation significance

The resultant distribution of biodiversity conservation significance values across all areas of mapped bushland within the Council area, including Lane Cove National Park, is shown in the graph below (**Figure 3**) and **Figure 4**.

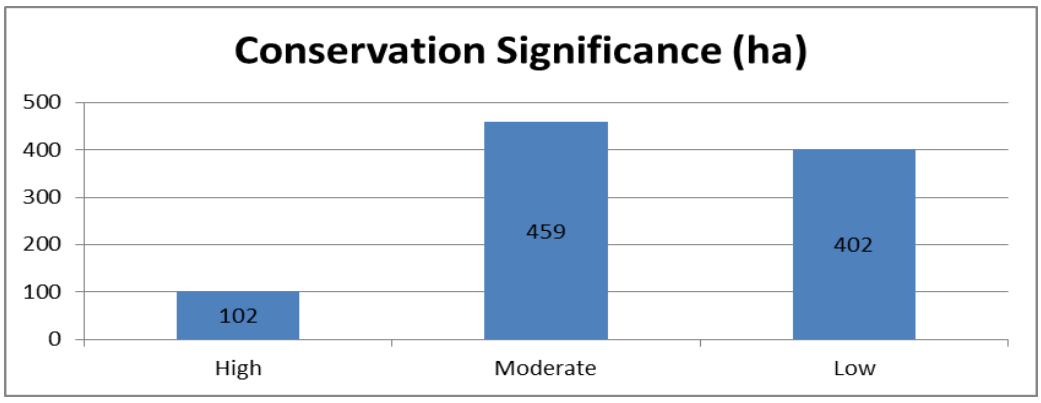

Figure 3: The distribution of conservation significance (high, moderate and low) in hectares for all areas of mapped bushland within CoR

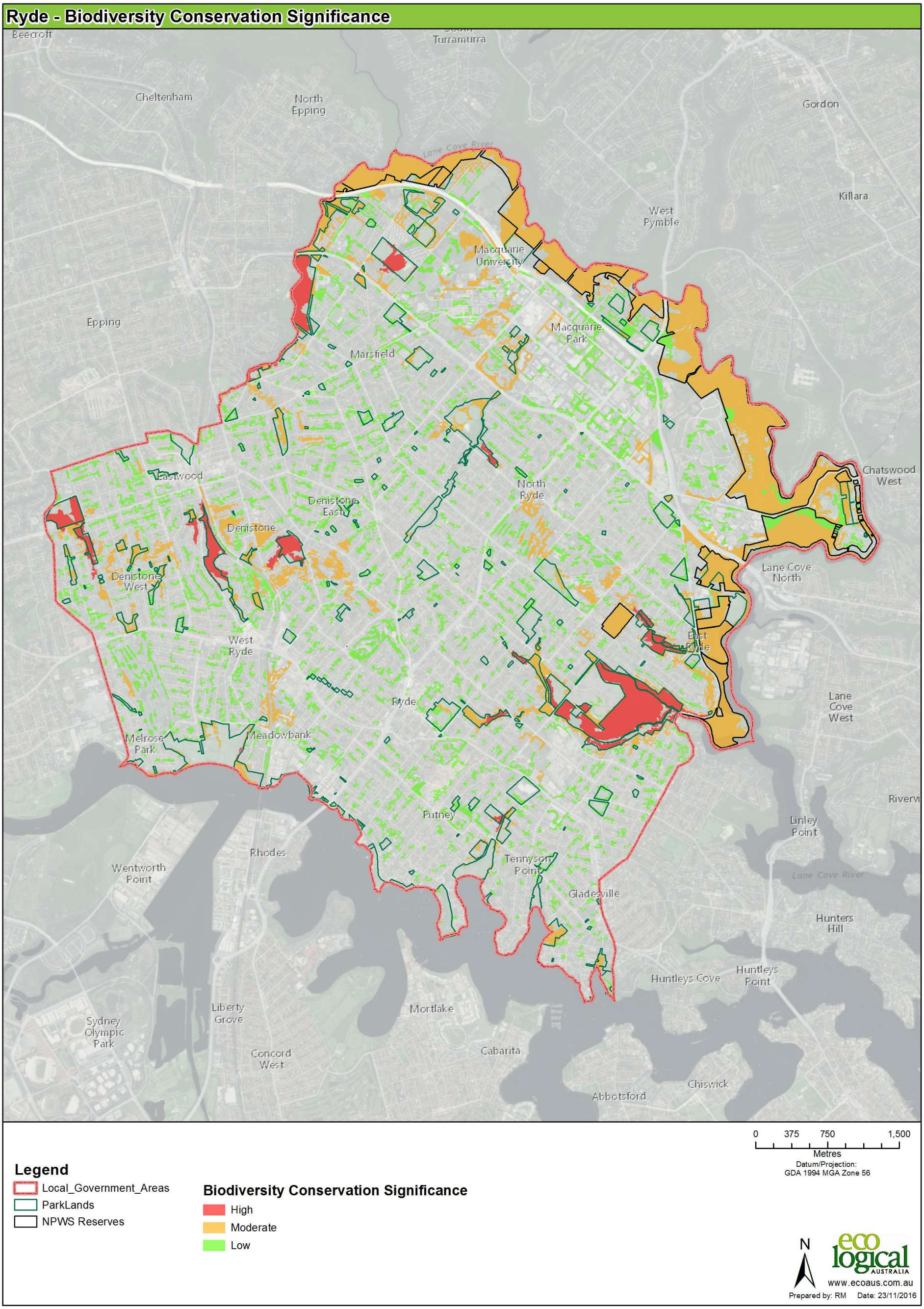

Figure 4: Biodiversity conservation significance

7.4 Threats to Biodiversity

The potential threats criteria include surrounding land use, potential edge disturbance and the influence of climate change through potential sea level rise using available associated data. The following available information was used in the process:

- Council of Ryde LEP Zoning
- Drainage network
- Contour data

The criteria assessed and scored for each bushland patch using the above datasets via a desktop GIS process using geo-processing, data filtering and reporting operations.

The assessment criteria and available score for each threat criterion are defined in **Table 5**.

Table 5: Threats to biodiversity – assessment criteria and score.

Major Values	Criteria	Supporting Information Measure	Score
Threats	Surrounding Land Use – T1	LEP Zoning	Adjacent to developed land = 50
	Weed Invasion Pathways (Hydrological Regimes / Residential Edge effects) – T2	GIS Analysis	Hydrological effects = 30 or Residential edge effects = 15
	Sea level rise – T3	Elevation data	Within 3m ASL = 20

The resultant score for each bushland patch is calculated and the value ranking of threat potential is based on the following total scores:

- High: 71 - 100
- Moderate 31 - 70
- Low: 0 - 30

The resultant distribution (in hectares) of potential threat values across all areas of mapped bushland within the Council area, including Lane Cove National Park, is shown below in **Figure 5** and **Figure 6**.

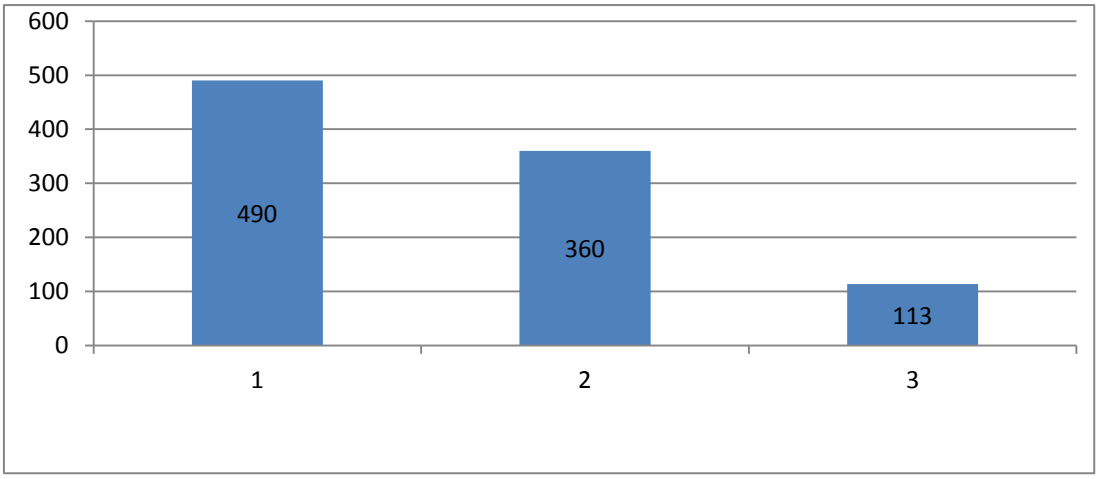

Figure 5: The distribution of threat scores (high, moderate and low) for all areas of mapped bushland within CoR

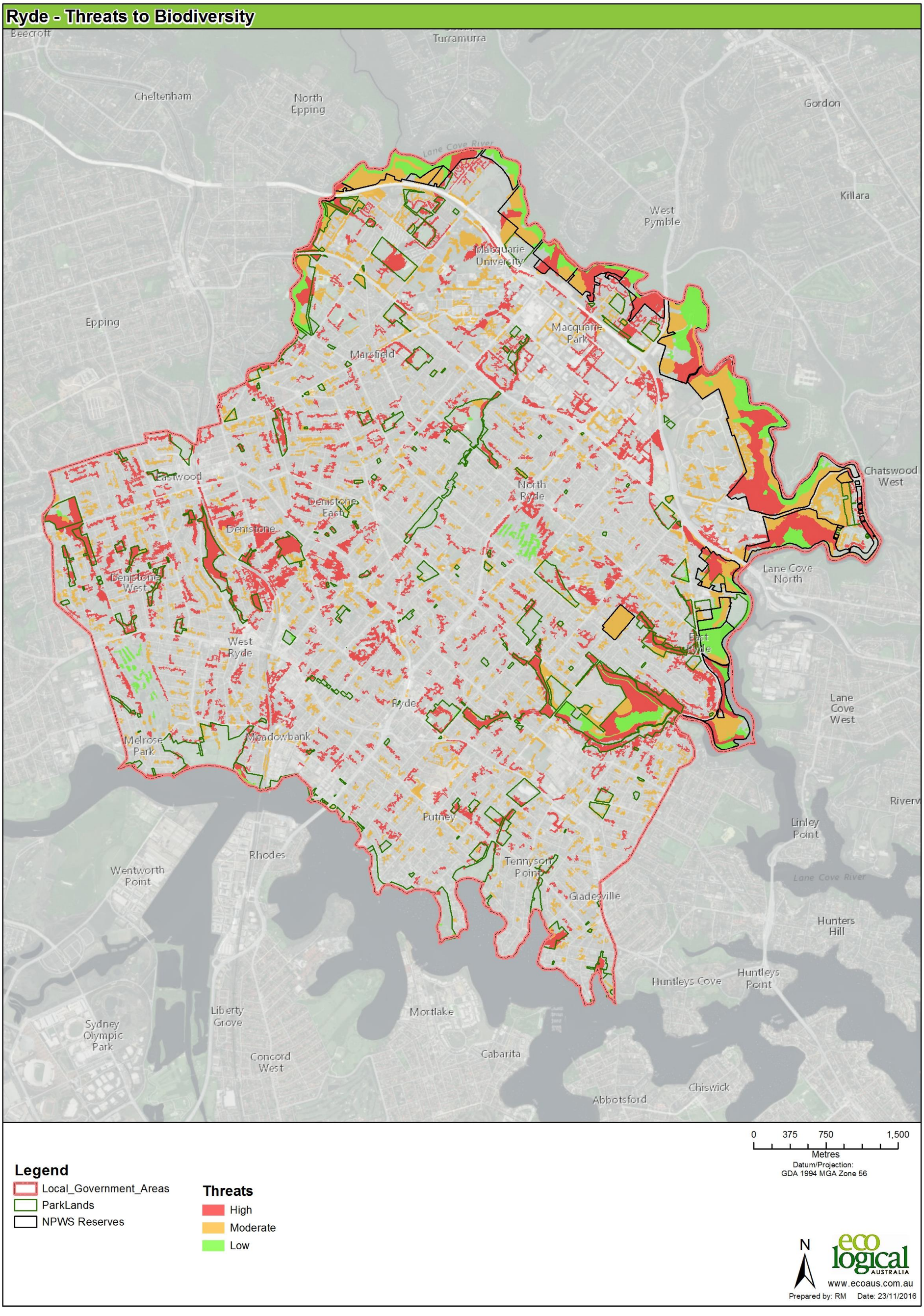

Figure 6: Threats to Biodiversity

7.5 Management Priority

A prioritisation matrix was developed, combining the conservation significance value and the potential threat value for each bushland area. The relationship between the conservation significance value and identified potential threat to biodiversity is shown in the prioritisation matrix below (**Table 6**).

Table 6: Prioritisation matrix

		Conservation Significance Value		
		High	**Moderate**	**Low**
Potential Threat Value	**High**	VH	H	M
	Moderate	H	M	L
	Low	M	L	VL

Areas of Very High (VH) prioritisation have the greatest urgency for management and action, whereas areas identified as Very Low (VL) prioritisation have the least priority for management.

The resultant distribution of management priority across all areas of mapped bushland within the Council area, including Lane Cove National Park, is shown in **Figure 7** and **Figure 8**.

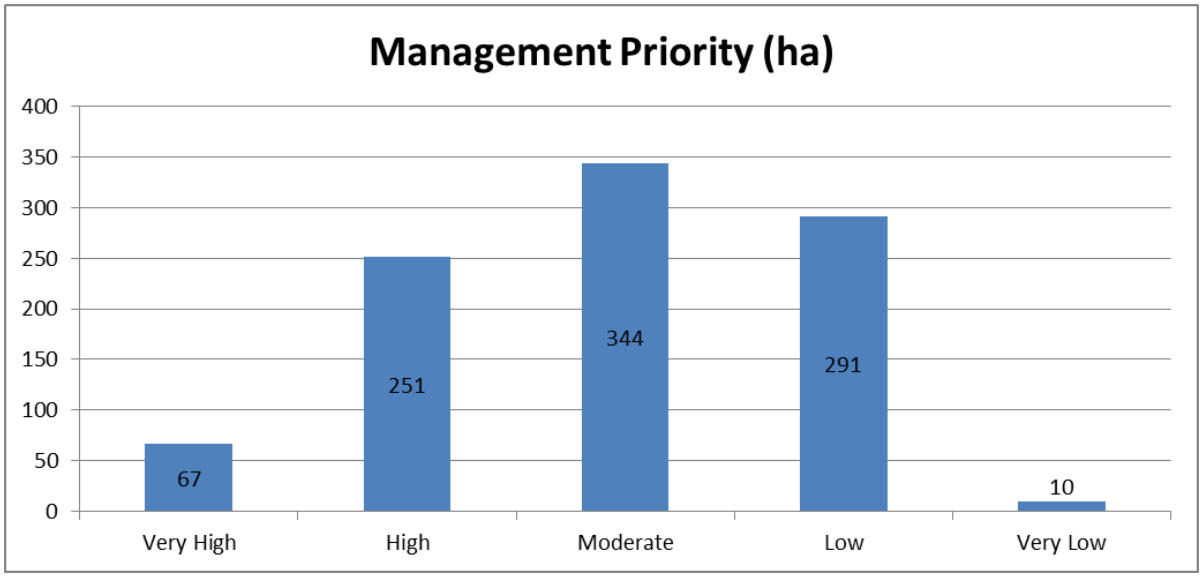

Figure 7: Distribution of bushland (in hectares) across the five management priorities

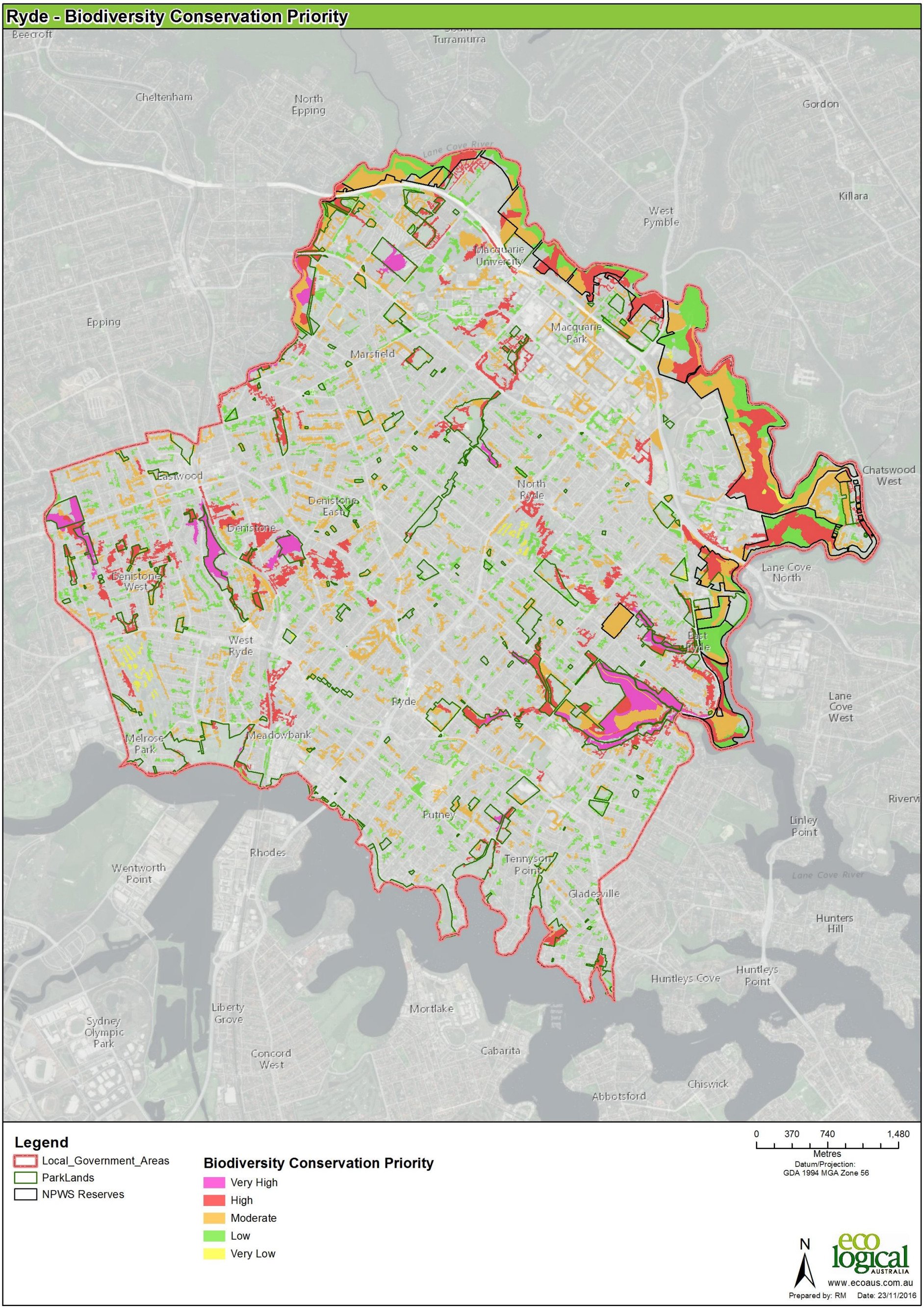

Figure 8: Biodiversity conservation priority

8 Biodiversity Targets

Strategic biodiversity targets are necessary to assess the performance of the Biodiversity Plan. Targets for City of Ryde (CoR) have been identified based on the relationship of the vision and themes for the plan, along with consultation with City of Ryde staff and the Bushland and Environment Advisory Committee (BEAC). Commonwealth, State and catchment based targets have also been reviewed and included where relevant.

These targets have also been aligned with the Ryde Community Strategic Plan (CoR 2013) which identified the following goals:

- clean and reduce pollution in waterways
- establish bushland in areas with a long-term benefit
- enhance natural corridors and waterways
- raise public and business environmental awareness

Table 7: Biodiversity plan targets by theme

Theme	Targets
Native Vegetation: protecting and managing Ryde's Native Vegetation	**Target 1.1:** Endeavour to protect 100% of native vegetation in Council Reserves **Target 1.2:** Improve 70% of vegetation within high priority bushland areas that are considered to have a high opportunity for conservation. **Target 1.3:** Retain the maximum amount of native vegetation across development and infrastructure zones **Target 1.4**: Roll-out biodiversity education for residents and Council staff **Target 1.5:** Maintain and improve the condition of vegetation in Council reserves
Urban Waterways: restoring waterways and surrounding environments.	**Target 2.1**: Measureable improvement in water quality across CoR waterways as per the CoR Community Strategy **Target 2.2**: Protect all significant wetlands and Coastal Saltmarsh **Target 2.3:** Restore the ecological function of high priority waterways and wetlands
Corridors and Connectivity: linking the landscape	**Target 3.1**: Measureable increase in connectivity within reserves **Target 3.2**: Increase in numbers and density of urban trees across CoR **Target 3.3**: Measureable increase in habitat coverage within and adjacent to identified regional corridors
Public Spaces: Managing our reserves to promote biodiversity and community interaction	**Target 4.1**: All actions identified in Plans of Management for reserves Implemented **Target 4.2**: All recreational activities in reserves to be compliant with biodiversity protection **Target 4.3** Increased community involvement in biodiversity education programs –

Theme	Targets
	aligned with the Ryde Community Strategic Plan strategy to raise awareness in our community on the future challenges to our natural environment and the actions required to mitigate them.
Urban Habitat: Protecting and managing biodiversity in the urban landscape	**Target 5.1**: Maintain and improve native species richness of flora and fauna in Council reserves – aligned with the Ryde Community Strategic Plan *to lead by example and demonstrate environmental sensitivity in all that we do* **Target 5.2**: 20% decrease in populations of pest fauna species in reserves - aligned with the Ryde Community Strategic Plan *to work collaboratively with neighbouring councils to develop measures to protect our natural environment and biodiversity.* **Target 5.3**: Ensure weed density is managed in high priority bushland areas to ensure protection of significant areas. **Target 5.4:** Establish and implement monitoring of habitat and condition values within high conservation priority areas. **Target 5.5**: Increase participation numbers in community bushcare groups including corporate volunteers - aligned with the Ryde Community Strategic Plan *to actively collaborate with our community and businesses to care for and enhance our environment* **Target 5.6:** Increase biodiversity habitat & protection on private land - aligned with the Ryde Community Strategic Plan *to actively collaborate with our community and businesses to care for and enhance our environment.*

8.1 Priority Areas

Areas of vegetation across the LGA have been prioritised in accordance to biodiversity conservation significance and potential threat to biodiversity. The priority areas have been identified through the conservation significance assessment process carried out as part of this Plan.

The biodiversity conservation significance values identify areas that are considered significant in achieving conservation goals across the LGA as well as providing effective biodiversity linkages within and outside of the LGA to promote and maintain regional biodiversity habitat connectivity (**Figure 2** & **Figure 4**). These areas should be managed for these values where possible.

Potential threats to biodiversity were also identified and ranked to determine which areas of biodiversity are at risk and require management emphasis (**Figure 6**).

Using resultant biodiversity conservation significance values and threat values for Reserves within the CoR, a management priority was derived for each Reserve using the priority matrix (**Table 5**).

Reserves of Very High (VH) prioritisation have the greatest urgency for management and action, whereas areas identified as Very Low (VL) prioritisation have the least priority for management (**Figure 8**).

Reserves resulting in a “Very High” and “High” priority ranking are listed below. A number of additional Reserves were also added into the “Very High” and “High” priority ranking due to Council operational

requirements as well as recognition of their community significance. **Appendix C** lists the conservation priorities, conservation significance and threat ranking for all reserves in Ryde that contain mapped native vegetation.

- Aitchandar Park
- Bremner Park
- Brush Farm Park
- Bundara Reserve
- Burrows Park
- Darvall Park
- Denistone Park
- Field Of Mars Reserve
- Forrester Park
- Forsyth Park
- Greenwood Park
- Kittys Creek Reserve
- Lambert Park
- Marsfield Park
- Pembroke Park
- Portius Park
- Pryor Park
- Tyagarah Park
- Barton Reserve
- Bell Park
- Booth Reserve
- Dunbar Park
- Els Hall Park
- Fielder Park
- Glades Bay Park
- Ivanhoe Reserve
- Koonadan Reserve
- Looking Glass Bay Park
- Lucknow Park
- Mallee Reserve
- Martin Reserve
- Maze Park
- Meadowbank Park
- Melrose Park
- Memorial Park
- Miriam Park
- Morrison Bay Park
- Outlook Park
- Pidding Park
- Putney Park
- Santa Rosa Park
- Somerset Park
- Symon's Reserve
- Tasman Park
- Tyrell Park
- Wallumatta Nature Reserve
- Wilga Park
- Yarramar Reserve
- Boobajool Reserve
- Christie Park
- Kobada Park
- Lynn Park*
- Minga Reserve*
- Stewart Park*

* Reserves added due to Council operational requirements and community significance

9 Biodiversity Actions

The following actions aim to maintain and improve biodiversity values across the City of Ryde based on the identified targets for each biodiversity theme. It is anticipated that primary responsibilities for the implementation of these actions will rest with the City of Ryde with the support of the relevant government agencies and the community of the City of Ryde.

The implementation timeframe for this strategy is five years. After five years, the Plan should be subject to a comprehensive review.

State agencies are currently developing targeted approaches for managing Threatened Ecological Communities (TECs) within NSW. In the interim, a number of management actions have been identified for TECs. Those actions that are relevant for the TECs that occur in Ryde have been incorporated into the following biodiversity action tables.

The following tables identify actions relevant to each of the identified biodiversity targets based on the existing body of biodiversity knowledge from relevant Plans, strategies and studies that have previously been prepared for the City of Ryde, as well as the conservation significance and prioritisation assessment carried out as part of this Plan. These actions are closely aligned with goals for a city of environmental sensitivity as identified in the Ryde 2025 Community Strategic Plan (CoR 2013).

Each group of actions relating to targets are assigned a priority for completion and a relevant responsibility for carrying out the actions. Priorities have been separated into:

- **H – High:** Actions investigated to commence within first year of the plan for completion within 5 years.
- **M – Medium:** Actions investigated to commence within first three years of the plan for completion within 7 years.
- **L – Low:** Actions investigated to commence within five years of the plan.

In addition to Councils budget from development contribution plans and rates, monetary grants and funding from various sources such as the NSW Environmental Trust and Catchment Management Authorities may be sought to carry out a number of the actions identified in this Plan. This includes actions which have a more regional biodiversity benefit such as connectivity and corridor enhancement or enhancement of vegetation or species habitat listed as threatened at either a State or Federal level (either through on ground action or knowledge advancement). Broad budget estimates have been included in the actions below, separated into capital expenditure and operational (ongoing) costs. These budgets are separated into:

- **H – High:** > $50 000
- **M – Medium:** <$50 000 and >$10 000
- **L – Low:** < $10 000

9.1 Biodiversity Theme 1: Native Vegetation: protecting and managing Ryde's Native Vegetation

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
Target 1.1: Endeavour to protect 100% of native vegetation in Council reserves.	1. For Council reserves containing TEC's as identified in Table 3: • Ensure that TEC's are being actively restored through bush regeneration and where required, that revegetation is undertaken using locally sourced stock from agreed planting list. • Identify threats on vegetation communities (eg. Drainage lines, tracks, rubbish dumping, infrastructure works in parks) and seek to incorporate into future Reserve plans of management. • Control and regulate access with fencing / delineation and signage particularly BGHF and STIF remnants subject to high levels of disturbance • Ensure that fire management of TEC's complies with the Bush Fire Environmental Assessment Code for NSW (0) 2. Conduct targeted field surveys of mapped STIF and BGHF TECs to validate and clarify condition. In particular, determine whether BGHF is present within Ryde LGA or if these areas are more accurately classified as STIF. 3. Provide a map of known occurrences of TEC's to Rural Fire Service and seek the inclusion of mitigative measures on Bush Fire Risk Management Plan(s), risk register and/or operation map(s).	H	Environment Strategic City Operations via Service Level Agreement	H M L	M NA
Target 1.2: Improve 70% of vegetation within high priority bushland areas that are considered to have a high opportunity for conservation.	4. Look for opportunities to expand and create Council managed bushland areas, particularly for areas with a high opportunity for conservation. 5. Areas identified as high conservation bushland that have passive use or no other planning implications (RE1 and RE2 public and private recreation) to be considered for rezoning review to E2).	M	Environment Strategic City	M L	L NA
Target 1.3: Retain the maximum amount of native	6. Prepare TEC identification and impact assessment guidelines for Council staff including development planners.	M	Environment	L	NA

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
vegetation across development and infrastructure zones	7. Council to consider TECs when reviewing and developing controls and policies and, where possible or relevant, investigate biodiversity certification. 8. Review current conditions of consent to include biodiversity consideration in development within or adjacent to Bushland as defined in SEPP 19 (Bushland in Urban Areas), particularly for identified TECs		Strategic City and Assessment	L	L
Target 1.4: Roll-out biodiversity education for residents and Council staff.	9. Develop and maintain a standardised environmental data collection process (templates) and information repository (natural assets database) for use by Council staff, consultants and volunteers 10. Where synergies exist seek to tie in with research by local schools, universities and community to determine ecological processes within bushland reserves, including fire ecology, soil seedbank, fragmentation, response to disturbance and recovery of TEC's. Aligned with the Ryde Community Strategic Plan goal *to actively collaborate with our community and businesses to care for and enhance our environment*. 11. Review Councils revegetation planting scheme for TEC's to ensure the correct species are being used for rehabilitation work in line with Council priorities. 12. Establish a regular update and review of flora and fauna survey mapping approximately every 5 years.	M	Environment	L L L H	L L NA L
Target 1.5: Maintain and improve the condition of vegetation in Council reserves	13. Review bush regeneration program (contracts) to ensure the highest priority areas are being actively managed in conjunction with procurement processes. 14. Identify new sites of high conservation value / priority that would benefit from establishment of a new bushcare group where interest has been identified by the community. 15. Develop a Noxious Weed Strategy (incorporating both private and public lands) which ensures the consideration of impacts on TECs when enforcing noxious weed or pest species control in TECs. The strategy should include Regulatory, Educational and On-ground related actions and activities as well as be consistent with current bushcare programs and activities. 16. Implement appropriate fire management practices (see **Appendix A** of this plan) for	H	Environment Environment Environment Environment Operations via Service	L M L L	NA L L L

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
	bushland reserves and consider ecological burns for maintaining maximum plants species richness and regeneration where feasible. 17. Investigate opportunities to establish BioBank or other incentives to help manage land for biodiversity and serve as a funding source. 18. Add the current and updated conservation significance assessment, threat assessment, conservation priority; regional and local connectivity layers to Councils GIS repository		Level Agreement, Land Information	L	NA

9.2 Biodiversity Theme 2: Urban Waterways: restoring waterways and surrounding environments

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
Target 2.1 Measureable improvement in water quality across CoR waterways	1. Continue the Natural Waterways Water Quality Monitoring Program targeting the following 5 main creek systems within the LGA: a. Terrys Creek b. Shrimptons Creek c. Porters Creek d. Buffalo Creek e. Archers Creek 2. Undertake regular water quality monitoring to identify pollution sources – involve schools, or universities to monitor sites. 3. Identify and prioritise specific threats on waterways and undertake appropriate on-ground site management strategies to address them within very high and high priority areas 4. Education of community “sweep instead of hose”. Re-inforce that everything on the streets enters our waterways. Aligned with the Ryde Community Strategic Plan goal *to promote and offer education on the benefits and savings that can be achieved by*	H	Environment Environmental Health and Building Strategic City	M L H L L	L L L L L

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
	supporting sustainable lifestyles and to clean and reduce pollution in our waterways. 5. Ensure Council policy includes WSUD features in DA's with consideration for frog friendly WSUD design guidelines.		Assessment Asset Systems	L	L
Target 2.2: Protect significant wetlands and Coastal Saltmarsh	6. Validate and update mapping of Coastal Saltmarsh EEC and develop a management plan to control/remove any relevant threatening processes. The following threats have been identified: • sedimentation resulting from catchment run off. • weed invasion including *Juncus acutus* at Kissing Point Park (Biosphere 2008). • freshwater inputs from stormwater at Settlers Park changing species composition by encouraging growth of *Phragmites australis* and Alligator Weed *Alternanthera philoxeroides* (Biosphere 2008). • *Salpichroa origanifolia* (which spreads via rhizomes and is very difficult to remove) invading saltmarsh at Field of Mars (Biosphere 2006/7). Management options include: a. fencing / delineation, b. mangrove removal (will require the prior approval from NSW Department of Primary Industries) c. re-positioning of stormwater outlets and d. weed removal.	H	Environment	H	L
Target 2.3: Restore the ecological function of high priority waterways and wetlands	7. Identify Key Fish Habitat as mapped by NSW Department of Primary Industries, to seek to restore and protect estuarine habitats (mangroves and saltmarsh) within the Ryde LGA (http://www.dpi.nsw.gov.au/research/areas/aquatic-ecosystems/estuarine-habitats-maps/IINSW_EstMac_map39a.pdf).	H	Environment	L	L

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
	8. Restoration works to enhance aquatic habitat (eg. Frog breeding sites, and native fish habitats) on high conservation value waterways / corridors.			M	L
	9. Target management of threats in high conservation value waterways / corridors (eg. Barton Reserve – *Isolepis prolifer,* Biosphere 2007).			L	L
	10. Educate internal stakeholders on the importance of estuarine wetlands			L	L

9.3 Biodiversity Theme 3: Corridors and Connectivity: linking the landscape

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
Target 3.1: Measureable increase in connectivity within reserves	1. Continue targeted restoration (weeding, planting, removal of threats) within reserves that fall within identified corridors (**Appendix D**) to enhance connectivity and habitat values	H	Environment	M	M

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
Target 3.2: Increase in numbers and density of urban trees across CoR	2. Outside of reserves, Council to implement the Urban Forest Plan and Street Tree Masterplan – in particular: a. retain senescent trees as habitat where safe to do so b. plan for tree removal and replanting through staged succession planting c. plant along habitat corridors identified in Figure EX.01 of the Street Tree Masterplan showing proposed habitat corridors and roads with high and low planting initiators (Street Tree Master Plan 2013); as well as within identified corridors from this Plan d. increase the number of street trees on nature strips along quiet roads using species well-adapted to soil conditions, which are low maintenance and have high fauna habitat values (eg. Melaleuca species provide a dense shrub layers and flowering for native birds; Eucalypt, Angophora and Banksia species provide both foraging and shelter habitat for a range of fauna species) 3. Work with providers of local native species and offer 2 free native trees per resident per year for collection from Council for planting in home gardens.	M	Environment Operations	M M	L M
Target 3.3: Measureable increase in habitat coverage within and adjacent to identified regional corridors	4. Identify opportunities for Council planning controls to provide greater provision for restoration of corridors (eg. Rezoning to E2) 5. Collaborate and look for opportunities with other large landholders including NPWS (Lane Cove National Park), Macquarie University, Ryde / Parramatta Golf Course and North Ryde Golf Course to undertake plantings and restoration work to enhance connectivity. 6. Link with other corridor projects in adjacent LGA's eg. Hunters Hill LGA Habitat Network Project and the Rivers to Rivers Corridor project (Environmental Trust and SMCMA in partnership with Hunters Hill LGA) to enhance corridors connecting the Parramatta River and Land Cover River foreshore parks with key habitats in the Field of Mars and Lane Cove National Park.	H	Strategic City Environment	L L M	L L L

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
	7. Provide initiatives for residents to provide habitat in their yards. 8. Consider habitat coverage and connection value in reviewing planning controls for properties adjacent to bushland. 9. Ensure all applications for development in riparian areas are in accordance with Councils WSUD technical manual and DPI - Water Guidelines.		Strategic City Environment	L L L	L L L

9.4 Biodiversity Theme 4: Public Spaces: Managing our reserves to promote biodiversity and community interaction

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
Target 4.1 All actions identified in Plans of Management for reserves Implemented	1. Plans of Management should continue to target weeds, bushfire, feral animals, planting and regeneration, particularly within the identified ecological corridors and high priority conservation areas 2. All Management Plans are taken into account when setting annual operational works plans and budgets 3. High priority actions are to be allocated funds for implementation 4. Consider developing Plans of Management for the priority reserves.	H	Environment Strategic City	H L L	M L NA
Target 4.2: All recreational activities in reserves to be compliant with biodiversity protection	5. Consider rehabilitation of unmanaged trails as required and encourage community to use formalised walking trails in Denistone Park: 6. Contain horse riding at Marsfield Park to the lawn area 7. Incorporate recreational and visitor activity considerations as part of existing and new plans of management for bushland, parks and reserves.	H	Environment	M L L	L L L

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
Target 4.3 Increased community involvement in biodiversity education programs – aligned with the Ryde Community Strategic Plan strategy *to raise awareness in our community on the future challenges to our natural environment and the actions required to mitigate them.*	8. Develop threatened species and endangered ecological community interpretive educational materials and conduct educational programs in key bushland reserves eg. Field of Mars and other high priority reserves using Councils Guided Walks Program 9. Identify potential suitable funding sources to provide training in wildlife habitat requirements for parks / reserve staff and volunteers eg. Controlling the spread of weed seed, retention of dead wood and stags. 10. Develop a Community biodiversity education strategy incorporating impacts of feeding native and feral animals, attracting wildlife to residential gardens, impacts of and alternatives to dumping garden waste, importance of responsible pet ownership, etc 11. Ensure biodiversity achievements and activities are promoted in Councils community newsletters and Annual report 12. Install regulatory signage at bushland reserve entrances to educate visitors about the biodiversity impacts of: a. rubbish dumping b. collection of firewood c. removal of fallen branches d. dog faeces 13. Identify and prioritise sites suitable for corporate planting events / activities 14. Promote and encourage local businesses to participate / sponsor planting events and activities as per Councils Bushcare Community Partnership Program 15. Enhance opportunities for corporate planting events ensuring the sites are sympathetic to prioritisation of natural areas. 16. Develop information factsheets on priority endangered and feral species for distribution to the community and websites	M	Environment	L M L L L L L L L L	L L L L L L L L L L

9.5 Biodiversity Theme 5: Urban Habitat: Protecting and managing biodiversity in the urban landscape

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
Target 5.1: Maintain and improve native species richness of flora and fauna in Council reserves – aligned with the Ryde Community Strategic Plan *to lead by example and demonstrate environmental sensitivity in all that we do.*	1. Retention of dead timber in reserves as habitat for fauna and to create a more complex understory structure and shelter sites from predators. Could establish artificial shelters for terrestrial mammals just like nest boxes replace tree hollows for possums and parrots. 2. Development consent could include the use of nest boxes to replace cleared habitat. Nest boxes are to be species specific and not encourage undesirable species. 3. Retention of weedy vegetation being utilised as habitat by native birds and animals.	M	Strategic City Environment Assessment	L L L	L L I
Target 5.2: 20% decrease in populations of pest fauna species in reserves - aligned with the Ryde Community Strategic Plan *to work collaboratively with neighbouring councils to develop measures to protect our natural environment and biodiversity.*	4. Develop and undertake regular feral animal control programs in conjunction with surrounding local government areas, in particular for feral fox and rabbit, particularly in areas with high threat ratings. 5. Consider implementation of cat control should the problem become more prevalent. 6. Investigate opportunities and options to manage the impacts of companion animals (dogs and cats) in core bushland areas. Undertake an audit of the Very High Conservation Priority parks and reserves where companion animal issues have been identified. 7. Restoration of bushland should aim to replace exotic weed species with a diverse and complex midstorey and understorey of native plant species to discourage aggressive bird species such as noisy miners that prefer a park like environment or canopy with no mid-storey. 8. Encourage community, contractors and volunteers to report feral animals (foxes, cats, rabbits) observed in bushland 9. Educate people about desexing pets as per the responsible pet ownership pamphlet	H	Environment Rangers Parking Services	L L L L L L	L L L L L L

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
Target 5.3: Ensure weed density is managed in high priority bushland areas to ensure protection of significant areas.	10. Review bush regeneration program to ensure high and very high priority sites are being actively managed. 11. Maintain monitoring and reporting of bush regeneration and bushcare sites. 12. Utilise condition bushland mapping to monitor progress of sites.	H	Environment Operations via SLA	L L L	L L L
Target 5.4 Establish and implement monitoring of habitat and condition values within high conservation priority areas	13. Educate parks / reserves maintenance and project staff to increase awareness of legislative responsibilities for protection and management of threatened species, populations and ecological communities for staff. Aligned with the Ryde Community Strategic Plan *to lead by example and demonstrate environmental sensitivity in all that we do.*	M	Environment Operations	M	L
Target 5.5: Increase participation numbers in community bushcare groups including corporate volunteers - aligned with the Ryde Community Strategic Plan *to actively collaborate with our community and businesses to care for and enhance our environment.*	14. Investigate planning and incentives programs to promote and encourage protection and management of EEC's and high conservation significant bushland on private land including funding sources. 15. Advertise bushcare groups and host information sessions, particularly in areas identified as very high and high priority that do not currently have a bushcare group 16. Explore the use of mechanisms such as Voluntary Conservation Agreements to promote the protection of significant habitat (such as EECs) on private land. 17. Coordinate detailed review and assessment (tenure/zoning/ownership/threats) of mapped EEC remnants outside of Council ownership, and target community education on EEC's towards these residents. 18. Encourage and promote best-practice management of EECs on private land through preparation and distribution of fact sheets for each EEC's to be distributed to identified landholders. 19. Liaise and support major landholders to protect and manage high conservation bushland through preparation of site specific Plans of Managements (eg. Private landholders, schools, golf courses, Macquarie University). 20. Develop a brochure to educate residents on the benefits to wildlife of using native	H	Environment	L L L L L L M	L L L L L L L

Targets	Actions	Priority	Responsibility	Budget Estimate	
				Capital	Operational
	species in residential gardens				
Target 5.6: Increase biodiversity habitat & protection on private land - aligned with the Ryde Community Strategic Plan *to actively collaborate with our community and businesses to care for and enhance our environment.*	21. Work with Planning department to develop tools for developers to provide suitable habitat on development sites 22. Develop planning instruments that ensure developments are sympathetic to biodiversity and neighbouring bushland 23. Develop tools for assessment officers to determine impacts on bushland/biodiversity/natural area during the preliminary assessment of a development application. 24. Engage with applicants in pre-DA lodgement discussions to include biodiversity considerations. 25. Revise and update Bushfire Prone Land Map	H	Strategic City Assessment Environment	L L L L L	L L L L L

10 Monitoring and Reporting

In order to monitor the long term progress of the biodiversity actions identified in this plan, the following monitoring and reporting is recommended:

- Establish a regular update and review of vegetation mapping and fauna survey every 5 years. Good baseline data already exists to build on from previous flora and fauna studies (eg. Biosphere 2006-2008, Insight Ecology 2010, 2011, Anne Clements and Associates 2016). Standardised data collection templates should be developed and the data for each reserve is to be collated by a nominated Council officer to ensure consistency over time.
- Consider using survey guidelines and standards developed by OEH for threatened species and field surveys:
    - http://www.environment.nsw.gov.au/surveys/GuidelinesForCarryingOutASurvey.htm
    - http://www.environment.nsw.gov.au/threatenedspecies/surveyassessmentgdlns.htm
- Some of this data can be collected through collaboration with primary, secondary and tertiary educational institutions and community groups, to encourage community involvement and biodiversity education, for example, bird observations, weeds and water quality monitoring.
    - http://www.environment.nsw.gov.au/surveys/SurveyParticipation.htm
    - http://www.environment.nsw.gov.au/surveys/CommunityBiodiversitySurveyManual.htm
- Ensure all data captured through flora and fauna assessments and surveys is incorporated into the Atlas of NSW Wildlife http://www.environment.nsw.gov.au/wildlifeatlas/about.htm
- A review of this plan is to be undertaken every 5 years and is to be documented in a separate report that includes:
    - The results of the flora and fauna survey and mapping including the extent of vegetation communities and presence/absence of fauna (birds, mammals, reptiles, frogs).
    - Re-run the conservation significance assessment using updated data to document changes in conservation significance, threat and management priority over the five year period
    - The actions in this plan shall be reproduced along with comment from the responsible person/s on the status of each action and any issues towards achievement.
    - Actions that have been executed should be dated with data provided to indicate the success or otherwise of this action.
    - The targets of this plan are to be listed along with comments on status and progress as well as any barriers preventing these targets from being met.
    - Monitor changes in legislation, policy and information relevant to biodiversity plan including a discussion of how this changes the priority of particular actions.

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Appendix A Bushfire Management of Ryde's Native Vegetation

Fire is a natural part of Australian ecosystems and many plant communities depend on fire for natural regeneration and maintaining species diversity. Optimal fire management in urban bushland is difficult to achieve due to the risk of fire escaping into adjacent urban areas. However, ecological burns and in senescent vegetation is an important disturbance for stimulating the soil seed bank. Biosphere Consultants (2007 and 2008) recommend ecological burns of Western Sydney Gully Forest in Glades Bay Park and Boobajool Reserve, Kitty's Creek, Somerset Park and Pryor Park). They sight pile burns in Ivanhoe Park showing good regeneration (Biosphere 2007). Pile burns have been undertaken at Darvall Park in 2003. Bush regeneration contractors at Marsfield Park noted that an ecological burn could assist with excessive termites.

Detailed bushfire planning for asset protection and sustainable ecosystems should be achieved through development of Management Plans for reserves within the LGA. The *Bush Fire Environmental Assessment Code for NSW* (NSW Rural Fire Service 2006b) specifies fire thresholds for specific vegetation communities, and this document should be consulted for all fire management related works on Council owned reserves. These thresholds are also listed in the more site specific Hunters Hill, Ryde, Lane Cove, Willoughby Bush Fire Risk Management Plan (2010) although via vegetation formation rather than specific communities.

Table 8: Bush Fire Environmental Assessment Code for NSW Recommendations

TSC Act Endangered Ecological Community	**BFEAC NSW Recommendations**	
	Minimum fire interval for Strategic Fire Advantage Zones (years)	**Minimum fire interval for Land Management Zones (years)**
Blue Gum High Forest in the Sydney Basin Bioregion	25	30 – low intensity fire only
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	7	10
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	7	10

TSC Act Endangered Ecological Community	BFEAC NSW Recommendations	
	Minimum fire interval for Strategic Fire Advantage Zones (years)	**Minimum fire interval for Land Management Zones (years)**
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	No burning permitted – a bush fire hazard reduction certificate cannot be issued in saline wetlands, except where works involve only the manual removal of noxious or environmental weeds (as defined within clause 4.9 of BFEAC) Land to which State Environmental Planning Policy No 14—Coastal Wetlands applies is "excluded lands" and a bush fire hazard reduction certificate cannot be issued.	
Sydney Turpentine-Ironbark Forest	10 (grassy subformation) 25 (shrubby subformation)	15 (grassy subformation) 30 (shrubby subformation) Both with low intensity fire only

Appendix B Rare and Threatened Flora within Ryde LGA

Threatened Species

Species Name	Conservation Status	Occurrence within City of Ryde Reserves
Callistemon linearifolius	Vulnerable TSC Act	None – all occurrences within National Park
Darwinia biflora	Vulnerable TSC Act Vulnerable EPBC Act	Laurel Park and non-reserve land
Epacris purpurescens var *purpurescens* –.	Vulnerable TSC Act	Recorded in several locations in the Sydney Ridgetop Woodland in Field of Mars Reserve
Eucalyptus nicholii	Vulnerable TSC Act Vulnerable EPBC Act	Non-reserve land
Grammitis stenophylla	Endangered, TSC Act	One record from non-reserve land near Somerset Park
Leptospermum deanei	Vulnerable TSC Act Vulnerable EPBC Act	Non-reserve between Westminster Park and Field of Mars
Melaleuca deanii	Vulnerable TSC Act Vulnerable EPBC Act	Non-reserve land near Cecil park Was observed near the track in the area below the M2 Motorway overpass at Lucknow Park and in Somerset Park (Biosphere 2007)
Persoonia hirsuta	Endangered, TSC Act Endangered, EPBC Act	One record from North Ryde Golf Course.
Pimelea curviflora ssp *curviflora*	Vulnerable TSC Act Vulnerable EPBC Act	Common within the very limited area of Coastal Shale – Sandstone Forest within Field of Mars Reserve (Kubiak 2005).
Prostanthera marifolia	Presumed extinct TSC Act Critically Endangered EPBC Act	Laurel Park and non-reserve land just outside Lane Cove National Park
Syzygium paniculatum	Endangered, TSC Act	One record from Macquarie University

Species Name	Conservation Status	Occurrence within City of Ryde Reserves
	Vulnerable EPBC Act	
Tetratheca glandulosa	Vulnerable TSC Act	Within Lane Cove National Park
Wilsonia backhousei	Vulnerable, TSC Act	Kissing Point Park and Bell Park Was found on one of the sandstone benches bordering the river at Looking Glass Bay, near the boundary with Banjo Patterson Park (Biosphere 2008). Kubiak (2005) noted a population at Melrose Park.

Source: NPWS Wildlife Atlas Data or otherwise referenced.

Rare species and their occurrence with in CoR reserves (Kubiak 2005)

Species Name	Location
Acacia binervata	Glades Bay Park, Pembroke Park
Acacia brownii	Field of Mars
Acacia stricta	Barton Reserve,Bundara Reserve, Field of Mars, Marsfield Park, Stewart Park
Acrotriche divaricata	Pembroke Park
Alectryon subcinereus	Lambert Park
Angophora floribunda	Darvall Park
Asplenium australasicum	Burrows Park
Astroloma pinifolium	Koboda Park
Astroloma humifusum	Portius Park
Austromyrtus tenuifolia	Field of Mars
Baeckea imbricata	Koboda Park
Calystegia marginata	Denistone Park, Lambert Park
Cassine australis	Brush Farm Reserve, Lambert Park
Cassinia denticulata	Marsfield Park
Citriobatus pauciflorus	Brush Farm Reserve
Convolvulus erubescens	Burrows Park, Lambert Park
Cryptocarya glaucescens,	Brush Farm Reserve
Cyperus tetraphyllus,	Brush Farm Reserve, Lambert Park
Daviesia ulicifolia ssp *ulicifolia*	Tasman Park
E. paniculata	Darvall Park
Eucalyptus acmenoides	Darvall Park
Eucalyptus acmenoides	White Mahogany
Eucalyptus punctata	Denistone Park, Stewart Park
Eucalyptus tereticornis	Bremner Park
Eupomatia laurina	Brush Farm Reserve

Species Name	Location
Gompholobium pinnatum	Field of Mars
Hakea gibbosa	Koboda Park
Hakea teretifolia	Koboda Park
Hymenophyllum cupressiforme	Lucknow Park
Lasiopetalum parviflorum	Pembroke Park
Lissanthe strigosa	Marsfield Park, Pembroke Park
Livistonia australis	Glades Bay Park
Maytenis sylvestris	Denistone Park
Melicope micrococca	Brush Farm Reserve
Muehlenbeckia gracillima	Denistone Park
Passiflora herbertiana ssp *herbertiana*	Denistone Park
Plantago debilis	Bundara Reserve, Darvall Park, Lambert Park
Plectranthus parviflorus	ELS Hall Park
Psilotum nudum	Pembroke Park
Pultenaea linophylla	Tasman Park
Pultenaea paleacea	Field of Mars
Pultenaea retusa	Field of Mars
Pultenaea scabra var *biloba*	Marsfield Park, Field of Mars
Pultenaea villosa	Field of Mars
Rhytidosporum procumbens	Lucknow Park
Rubus parvifolius	Brush Farm Reserve, Darvall Park, Lucknow Park
Rubus rosifolius,	Brush Farm Reserve, Lambert Park
Schizomeria ovata,	Brush Farm Reserve
Stylidium lineare	ELS Hall Park
Styphelia longifolia	Koboda Park
Styphelia tubiflora	Somerset Park
Thelymitra pauciflora	Koboda Park
Trachymene incisa ssp incisa	ELS Hall Park, Field of Mars, Pidding Park, Wallamutta Nature Reserve

Appendix C Conservation Priority of Reserves

Reserve	Conservation Priority	Conservation Significance Value	Threat Value
Aitchandar Park	Very High	High	High
Bremner Park	Very High	High	High
Brush Farm Park	Very High	High	High
Burrows Park	Very High	High	High
Darvall Park	Very High	High	High
Denistone Park	Very High	High	High
Field Of Mars Reserve	Very High	High	High
Forrester Park	Very High	High	High
Forsyth Park	Very High	High	High
Greenwood Park	Very High	High	High
Kittys Creek Reserve	Very High	High	High
Lambert Park	Very High	High	High
Marsfield Park	Very High	High	High
Meadowbank Park	Very High	High	High
Pembroke Park	Very High	High	High
Portius Park	Very High	High	High
Pryor Park	Very High	High	High
Tyagarah Park	Very High	High	High
Barton Reserve	High	High	High
Bell Park	High	Moderate	High
Boobajool Reserve	High	Moderate	Moderate
Booth Reserve	High	Moderate	High
Bundara Reserve	High	Moderate	Moderate
Christie Park	High	Moderate	Moderate
Dunbar Park	High	Moderate	High
ELS Hall Park	High	Moderate	High
Fielder Park	High	Moderate	High
Glades Bay Park	High	Moderate	High
Ivanhoe Reserve	High	Moderate	High
Kobada Park	High	Moderate	Moderate
Koonadan Reserve	High	Moderate	High
Looking Glass Bay Park	High	Moderate	High
Lucknow Park	High	Moderate	High
Mallee Reserve	High	Moderate	High
Martin Reserve	High	Moderate	High
Maze Park	High	Moderate	High
Melrose Park	High	Moderate	High
Memorial Park	High	High	High

Reserve	Conservation Priority	Conservation Significance Value	Threat Value
Miriam Park	High	Moderate	High
Morrison Bay Park	High	Moderate	High
North Ryde Common	High	Moderate	High
Outlook Park	High	Moderate	High
Pidding Park	High	High	Moderate
Putney Park	High	Moderate	High
Santa Rosa Park	High	Moderate	High
Somerset Park	High	Moderate	High
Symon's Reserve	High	Moderate	High
Tasman Park	High	Moderate	High
Tyrell Park	High	Moderate	High
Wilga Park	High	Moderate	High
Yarramar Reserve	High	Moderate	High
Lynn Park	High	Moderate	High
Minga Reserve	High	Moderate	High
Stewart Park	High	Moderate	Moderate
Wallumatta Nature Reserve	High	Moderate	Moderate
Alston Park	Moderate	Moderate	Moderate
Anderson_Pk_Ryde_Wharf_Reserve	Moderate	Moderate	Moderate
Ann Thorn Park	Moderate	Low	High
Banool Reserve	Moderate	Moderate	Moderate
Beattie Park	Moderate	Low	High
Bill Mitchell Park	Moderate	Low	High
Bimbi Reserve	Moderate	Low	High
Blenheim Park	Moderate	Low	High
Booral Reserve	Moderate	Low	High
Braemar Park	Moderate	Low	High
Brereton Park	Moderate	Low	High
Carara Reserve	Moderate	Low	High
Cecil Park	Moderate	Low	High
Charity Creek Cascades	Moderate	Low	High
Cleves Park	Moderate	Low	High
Community Park	Moderate	Low	High
Cudal Reserve	Moderate	Low	High
Donovan Park	Moderate	Low	High
Driver Park	Moderate	Low	High
Dunholm Reserve	Moderate	Low	High
Eastwood Park	Moderate	Low	High
Elouera Reserve	Moderate	Moderate	Moderate
Flinders Park	Moderate	Low	High
Gannan Park	Moderate	Low	High

Reserve	Conservation Priority	Conservation Significance Value	Threat Value
Girraween Reserve	Moderate	Low	High
Glen Reserve	Moderate	Low	High
Granny Smith Memorial Park	Moderate	Low	High
Gwandalan Reserve	Moderate	Moderate	Moderate
Helene Park	Moderate	Moderate	High
Hubert Hunt Reserve	Moderate	Moderate	Moderate
Jacaranda Reserve	Moderate	Low	High
Jennifer Park	Moderate	Low	High
Jones Street Reserve	Moderate	Low	High
Jordan Park	Moderate	Low	High
Korpie Reserve	Moderate	Moderate	High
Kotara Park	Moderate	Low	High
Linton Park	Moderate	Low	High
Lions Park	Moderate	Low	High
Lonsdale Park	Moderate	Low	High
Lynelle Park	Moderate	Low	High
Magdala Park	Moderate	Moderate	Moderate
Mccauley PARK	Moderate	Low	High
Midgee Reserve	Moderate	Low	High
Myall Reserve	Moderate	Low	High
North Ryde Park	Moderate	Low	High
Nundah Reserve	Moderate	Moderate	High
Olympic Park	Moderate	Low	High
Parry Park	Moderate	Low	High
Patience Park	Moderate	Low	High
Peel Park	Moderate	Low	High
Pioneer Park	Moderate	Low	High
Princess Park	Moderate	Low	High
Rafferty Reserve	Moderate	Moderate	Moderate
Settlers Park	Moderate	Moderate	High
Tuckwell Park	Moderate	Low	High
Valerie Park	Moderate	Low	High
Waterloo Park	Moderate	Moderate	High
Watts Park	Moderate	Low	High
Wendy Park	Moderate	Low	High
West Denistone Park	Moderate	Moderate	High
Westminster Park	Moderate	Low	High
Westminster Rd - Unnamed Park	Moderate	Low	High
Woolway Reserve	Moderate	Low	High
Yinnell Reserve	Moderate	Moderate	High
Banjo Paterson Park	Moderate	Moderate	Moderate

Reserve	Conservation Priority	Conservation Significance Value	Threat Value
Jim Walsh Park	Moderate	Moderate	High
Kissing Point Park	Moderate	Moderate	Moderate
Yurrah Reserve	Moderate	Moderate	Moderate
Acacia Park	Low	Low	Moderate
Atkinson Reserve	Low	Low	Moderate
Australia Ii Park	Low	Low	Moderate
Boyla Reserve	Low	Low	Moderate
Byron Park	Low	Low	Moderate
Catherine Park	Low	Low	Moderate
Darri Reserve	Low	Low	Moderate
Fontenoy Park	Low	Low	Moderate
Hardy Park	Low	Low	Moderate
Henri Dunant Reserve	Low	Low	Moderate
Hibble Park	Low	Moderate	High
Irene Park	Low	Low	Moderate
John Miller Park	Low	Low	Moderate
Jupp Reserve	Low	Moderate	High
Kings Park	Low	Low	Moderate
Unnamed Park	Low	Low	Moderate
Laurel Park	Low	Moderate	High
Liberty Park	Low	Low	Moderate
Mary Ellen Park	Low	Moderate	High
Monash Park	Low	Low	Moderate
Moore Park	Low	Low	Moderate
Nerang Park	Low	Low	Moderate
Nimbin Reserve	Low	Low	Moderate
Pindari Park	Low	Low	Moderate
Quandong Reserve	Low	Moderate	High
Quebec Reserve	Low	Low	Moderate
Rotary Park	Low	Low	Moderate
Rutherford Park	Low	Moderate	High
Salter Park	Low	Low	Moderate
Sindel Reserve	Low	Low	Moderate
Trafalgar Reserve	Low	Low	Moderate
Warrawong Reserve	Low	Moderate	High
Yamble Reserve	Low	Low	Moderate
Ryde Park	Low	Moderate	High
Anzac Park	Very Low	Low	Low
Kenneth Park	Very Low	Moderate	High

Appendix D Threatened Fauna within Ryde LGA

Species Name	Common Name	Conservation Status	Occurrence within City of Ryde Reserves
Pseudophryne australis	Red-crowned Toadlet	Vulnerable TSC Act	Seven records since 1990 all in non-reserve land and national park. Last record 2012. May be present in LGA.
Litoria aurea	Green and Golden Bell Frog	Endangered TSC Act Vulnerable EPBC Act	1993 from non-reserved land near Pioneer Park. 2 records from Macquarie University in 1995 and 1999 Unlikely to occur in Ryde LGA.
Ephippiorhynchus asiaticus	Black-necked Stork	Endangered TSC Act	One record in 2004 from non-reserve land. Unlikely to occur in LGA.
Botaurus poiciloptilus	Australasian Bittern	Endangered TSC Act and EPBC Act	One record in 2011 from national park.
Ixobrychus flavicollis	Black Bittern	Vulnerable TSC Act	1997 in Field of Mars 2008 from national park
Hieraaetus morphnoides	Little Eagle	Vulnerable TSC Act	1991 from non-reserve land
Pandion cristatus	Eastern Osprey	Vulnerable TSC Act	1988 from North Ryde Golf Course
Calidris ferruginea	Curlew Sandpiper	Endangered TSC Act Migratory species EPBC Act	1983 from non-reserve land
Limosa limosa	Black-tailed Godwit	Vulnerable TSC Act Migratory species EPBC Act	1982 from non-reserve land
Glossopsitta pusilla	Little Lorikeet	Vulnerable TSC Act	2010 from non-reserve land
Ninox strenua	Powerful Owl	Vulnerable TSC Act	12 records within non-reserve land and the following reserves – Yinnel, Barton, Field of Mars and Atkinson.

Species Name	Common Name	Conservation Status	Occurrence within City of Ryde Reserves
			Records close to the following reserves – Marsfield, Symon's, West Denistone Park and Olympic Park. Most recent record from 2013.
Daphoenositta chrysoptera	Varied Sittella	Vulnerable TSC Act	1997 from Field of Mars
Petaurus australis	Yellow-bellied Glider	Vulnerable TSC Act	1999 from Kobada Park
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable TSC Act and EPBC Act	Numerous recent records from non-reserve land and the following reserves – Burrows, Field of Mars, Portius Park, Boobajool, Magdala Park and Lucknow.
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable TSC Act	5 records between 2004 – 08 from national park. 2008 from Martin Reserve.

Source: Bionet (NPWS Wildlife Atlas Data), post 1990 data.

Appendix E Reserves within Identified Corridors

The following Reserves containing native vegetation within the City of Ryde fall within the identified corridors (**Figure 2**).

Corridor Type	Catchment / Name	Park Name
Regional Connectivity	Buffalo Creek Corridor	Burrows Park
		Field Of Mars Reserve
		Hardy Park
		Laurel Park
Regional Connectivity	Dundas Valley Corridor	Bell Park
		Bimbi Reserve
		Brush Farm Park
		Cooper Reserve
		Darvall Park
		Denistone Park
		Hibble Park
		Lambert Park
		Lonsdale Park
		Lynn Park
		Rutherford Park
		Symon's Reserve
		Warrawong Reserve
		West Denistone Park
Regional Connectivity	Kitty’s Creek Corridor	Boobajool Reserve
		Brereton Park
		Kittys Creek Reserve
		Martin Reserve
		North Ryde Common
		Portius Park
		Pryor Park
		Wallumatta Nature Reserve
Regional Connectivity	Lane Cove River Corridor	Alston Park
		Banool Reserve
		Barton Reserve
		Christie Park
		Field Of Mars Reserve

Corridor Type	Catchment / Name	Park Name
		Fielder Park
		Kobada Park
		Magdala Park
		Marsfield Park
		Mulhall Park
		Pidding Park
		Pioneer Park
		Rafferty Reserve
		River Ave - Unnamed Reserve
		Stewart Park
		Talavera Reserve
		Trafalgar Reserve
		Waterloo Park
Local Connectivity	Meadowbank Corridor	Janet Park
		Jennifer Park
		Mary Ellen Park
		Maze Park
		Memorial Park
		Patience Park
		Woolway Reserve
Regional Connectivity	Parramatta River Corridor	Aitchandar Park
		Anderson Park
		Anderson Park Ryde Wharf Reserve
		Banjo Paterson Park
		Barton Reserve
		Bidgee Park
		Bremner Park
		Gannan Park
		Helene Park
		Kissing Point Park
		Koonadan Reserve
		Korpie Reserve
		Mallee Reserve
		Mccauley Park
		Meditation Park
		Melrose Park

Corridor Type	Catchment / Name	Park Name
		Memorial Park
		Minga Reserve
		Morrison Bay Park
		Olympic Park
		Pidding Park
		Putney Park
		Settlers Park
		Tyagarah Park
Local Connectivity	Shrimptons Creek Corridor	Booth Reserve
		Catherine Park
		Elouera Reserve
		ELS Hall Park
		Flinders Park
		Greenwood Park
		Quandong Reserve
		Santa Rosa Park
		Tindarra Reserve
		Wilga Park
Regional Connectivity	Terrys Creek Corridor	Forrester Park
		Forsyth Park
		Gwendale Park
		Jim Walsh Park
		Jupp Reserve
		Lucknow Park
		Pembroke Park
		Somerset Park
		Yarramar Reserve
Local Connectivity	Strangers Creek Corridor	Field of Mars Reserve
		Tyrell Park
		North Ryde Common
Local Connectivity	Pages Creek Corridor	Myall Reserve
		Blenheim Park
		Bundara Reserve

Appendix F Reserves containing Threatened Ecological Communities

Forty Reserves, listed below and noted in **Table 3**, include the presence of approximately 46 ha of Threatened Ecological Communities (TECs); however, not all have resulted in a “Very High” and “High” priority ranking.

- Aitchandar Park*
- Banool Reserve
- Barton Reserve*
- Bell Park*
- Booth Reserve*
- Braemar Park
- Brush Farm Park*
- Bundara Reserve*
- Burrows Park*
- Darvall Park*
- Denistone Park*
- Dunbar Park*
- ELS Hall Park*
- Field Of Mars Reserve*
- Forrester Park*
- Forsyth Park*
- Glades Bay Park*
- Greenwood Park*
- Hubert Hunt Reserve
- Jim Walsh Park
- Kenneth Park
- Koonadan Reserve*
- Korpie Reserve
- Lambert Park*
- Looking Glass Bay Park*
- Lynn Park
- Marsfield Park*
- Melrose Park*
- Minga Reserve
- Miriam Park
- Outlook Park*
- Pioneer Park
- Portius Park*
- Pryor Park*
- Settlers Park
- Stewart Park
- Symon's Reserve*
- Tyrell Park
- Wallumatta Nature Reserve
- Yarramar Reserve*
- Ryde Park

*”Very High” or “High” priority ranking