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## Technical Implementation Report

Camellia – Rosehill Place Strategy

Report prepared by Narla Environmental

for Department of Planning and Environment c/o COX Architecture

July 2022



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| <b>Report:</b>       | Technical Implementation Report – Camellia – Rosehill Place Strategy |
| <b>Prepared for:</b> | Department of Planning and Environment, C/o Cox Architecture         |
| <b>Prepared by:</b>  | Narla Environmental Pty Ltd  |
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# Glossary

| Acronym/ Term       | Definition   |
|---------------------|--|
| ASL                 | Above Sea Level  |
| BAM                 | Biodiversity Assessment Method   |
| BC Act              | New South Wales Biodiversity Conservation Act 2016   |
| BCAR                | Biodiversity Certification Assessment Report   |
| BDAR                | Biodiversity Development Assessment Report   |
| DA                  | Development Application  |
| DAWE                | Department of Agriculture, Water and the Environment   |
| Development         | The use of land, and the subdivision of land, and the carrying out of a work, and the demolition of a building or work, and the erection of a building, and any other act, matter or thing referred to in section 26 that is controlled by an environmental planning instrument but does not include any development of a class or description prescribed by the regulations for the purposes of this definition (Environmental Planning and Assessment Act 1979). |
| DoEE                | Department of Environment and Energy   |
| DPE                 | Department of Planning and Environment   |
| DPI                 | Department of Primary Industries   |
| DPIE                | Department of Planning, Industry and Environment (now known as DPE)  |
| ECA                 | Ecological Constraints Assessment  |
| EP&A Act            | Environmental Planning & Assessment Act 1979   |
| EPBC Act            | Environment Protection and Biodiversity Conservation Act 1999  |
| FFA                 | Flora and Fauna Assessment Report  |
| FM Act              | Fisheries Management Act 1994  |
| GPOP                | Greater Parramatta and Olympic Peninsula   |
| ha                  | Hectares   |
| km                  | Kilometre  |
| LEP                 | Local Environmental Plan   |
| LGA                 | Local Government Area  |
| Locality            | The area within a 10 km radius of the Precinct. The same meaning when describing a local population of a species or local occurrence of an ecological community.   |
| m                   | metres   |
| mm                  | millimetres  |
| NSW                 | New South Wales  |
| OEH                 | Office of Environment and Heritage (now known as the DPE)  |
| PDCCP               | Parramatta Development Control Plan 2011   |
| PLEP                | Parramatta Local Environmental Plan 2011   |
| SEPP                | State Environmental Planning Policy  |
| Subject Site        | The Camellia – Rosehill Precinct   |
| REF                 | Review of Environmental Factors  |
| Threatened entities | Species, populations and ecological communities specified in Schedules 1 and 2 of the BC Act 2016  |

# Executive Summary

Cox Architecture has engaged Narla Environmental on behalf of the Department of Planning and the Environment (DPE) to deliver technical studies for the Integrated Master Plan, to assess the overall strategy from an ecological perspective and provides advice on any likely ecological impacts (adverse and positive), and identifies future works that may be required to deliver the preferred development scenario with respect to ecology.

Despite the historic industrial land uses associated with the Camelia-Rosehill Precinct, a series of unique and diverse ecological features were identified. These included a variety of state and federally listed threatened ecological communities, numerous historical records of threatened flora and fauna species, and areas of unique key fish and migratory shore bird habitat.

The Master Plan has been analysed in this report from an ecological perspective, to identify any areas that are likely to be impacted, as well as those that will see an overall improvement by the strategy as a whole. This report also outlines recommendations in which the strategy could implement to further improve aspects of biodiversity within the Precinct in the future.

The main impacts to ecology associated with the Master Plan are those associated with the proposed crossings of Parramatta River and Duck River. These works are likely to require the removal of mangrove vegetation and shorebird habitat and will result in a localised impact on the riparian corridor.

The Master Plan and overall strategy however also implements a series of measures that are likely to result in a positive increase to the ecology of the Precinct, including:

- The implementation of a 40m foreshore areas within the Precinct with the reestablishment of required riparian areas;
- The continued protection of the wetland area;
- The creation of new areas of open space; and
- The proposed greening and remediation strategies.

Narla have also identified a number of opportunities to improve biodiversity across the Precinct, including:

- All river crossings should be strategically located as best as possible in already cleared areas or designed to minimise impacts on the foreshore environment;
- Creating a buffer area around the wetland area to minimise indirect impacts associated with surrounding land uses which may cause edge effects;
- If ownership of the wetland transfers to Council or other state agency, then a specific management plan should be prepared to ensure the ongoing survival and enhancement of the wetland area. This should be in line with the objectives of the current Plan of Management for the wetland (Biosphere 2014) and enhanced where needed;
- Mangrove revegetation should happen in areas along the foreshore that are not being utilised for river crossings. Areas that have been historically cleared or have been identified in the remediation plan should be prioritised;
- Locally indigenous street tree plantings should be utilised for the greening strategy along all roads in the Precinct to improve canopy cover connectivity;
- Future development should aim to avoid the removal of endemic and native vegetation and should incorporate locally indigenous species into all landscape plans to improve the general ecology across the Precinct;
- Future development in close proximity to the wetland or riparian corridors should provide a buffer between the development and the sensitive vegetation. This buffer should be managed under a

vegetation management plan, to minimise edge effects and to protect and enhance the sensitive vegetation nearby; and

- Areas of greenspace should be created within the Precinct utilising locally indigenous flora species to provide increase foraging resources for native species.



# 1. Introduction

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## 1.1 Project Description

New South Wales Department of Planning and Environment (DPE), in collaboration with City of Parramatta Council (Council), industry, the community and state agencies, is leading the development of the Camellia-Rosehill Place Strategy and Master Plan for the Camellia –Rosehill Precinct (the Precinct). The Precinct is defined by Parramatta River to the north, Duck River to the east, the M4 Motorway to the south and James Ruse Drive to the west, all of which form physical boundaries to the Precinct.

The Camellia Rosehill Precinct (the Precinct) is presently dominated by industrial activity, with large amounts of land also allocated to Rosehill Gardens Racecourse and stabling yards for Parramatta Light Rail and Sydney Metro. Its industrial legacy means that soils are heavily contaminated across most of the Precinct.

Located in the geographic heart of Sydney, the Precinct has an important strategic role in the Greater Parramatta and Olympic Peninsula (GPOP). Previous investigations have identified that the area should be retained for urban service land with a town centre, but that the costs of infrastructure and remediation should be carefully considered when making future land use decisions.

The Place Strategy and Master Plan has been prepared for the whole Precinct and draws on the substantial body of previous investigations, including ongoing collaboration with industry, the community and state agencies.

The overarching objective of the Place Strategy is to provide an integrated 20-year vision, which recognises the strategic attributes of the Precinct, guides future land use and infrastructure investment decisions and which can be delivered with the support of state and local agencies.

DPE has engaged Narla Environmental to deliver technical studies for the Integrated Master Plan, to assess the overall strategy from an ecological perspective and provides advice on any likely ecological impacts (adverse and positive), and identifies future works that may be required to deliver the preferred development scenario with respect to ecology.

An Enquiry by Design (EbD) process was undertaken to inform the preparation of the Place Strategy. The EbD was an interactive process which explored a number of master plan options for Camellia-Rosehill which could deliver the vision for the Precinct, and resulted in a Master Plan which was the subject of public consultation as part of the Camellia-Rosehill Directions Paper. The Master Plan was further refined following exhibition of the Directions Paper and consideration of the submission received.

The draft place strategy was publicly exhibited on 17 December 2021 until 4 March 2022. The draft master plan was further refined following exhibition of the draft place strategy and consideration of the submissions received. Refer to the Department of Planning and Environment’s finalisation report for further information.

## 1.2 Project Background

The Camellia Rosehill Precinct (~321ha) plays a strategic role in the Greater Parramatta and the Olympic Peninsula (GPOP). Camellia was identified by the NSW Government as a priority growth area in 2014, resulting in Precinct wide Land Use and Infrastructure Strategy in 2015 and subsequently development of a Town Centre Master Plan in 2018. Work on the Town Centre was paused pending outcomes of Greater Sydney’s 2019 Draft Place-based Infrastructure Compact (PIC) Pilot which aimed to ensure infrastructure delivery was matched with growth across the 26 precincts in the GPOP corridor. The PIC recommended that Camellia be retained for urban service and industrial land, however, should the Government seek to progress a town centre (in the form of the

2018 plan or a modified form), before any rezoning a number of issues had to be resolved. It was determined that a coordinated and strategic approach was required, and a place strategy be prepared for the whole Precinct, drawing on previous work and including ongoing collaboration with industry, the community and state agencies.

### 1.3 Existing Ecology within the Precinct

The Precinct is currently dominated by large scale industrial operations, with ecological features being limited to a wetland area in the east, remnant and mangrove vegetation around the periphery and scattered urban/native exotic vegetation (**Figure 1**). The native ecological communities that were identified within the Precinct, despite being historically disturbed by historic land use, are protected under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act [Commonwealth]), the *Biodiversity Conservation Act 2016* (BC Act [State]) and also the *Fisheries Management Act 1994* (FM Act [State]) including:

- Estuarine Swamp Oak Forest (*EPBC Act* – Endangered; *BC Act* – Endangered);
- Estuarine Mangrove Forest (*FM Act* – Protected);
- Estuarine Reedland (*BC Act* – Endangered); and
- Estuarine Saltmarsh (*EPBC Act* – Vulnerable; *BC Act* – Endangered; *FM Act* – Protected).

A variety of threatened species have also been historically recorded within the Precinct, which are also protected under the *EPBC Act* and the *BC Act 2016* (**Figure 2**). Such species include:

- Downy Wattle (*Acacia pubescens*), most recently recorded in 2008 (*EPBC Act* – Vulnerable; *BC Act* – Vulnerable);
- Eastern Osprey (*Pandion cristatus*), most recently recorded in 2008 (*BC Act* – Vulnerable);
- Green and Golden Bell Frog (*Litoria aurea*), most recently recorded in 2005 (*EPBC Act* – Vulnerable; *BC Act* - Endangered);
- Grey-headed Flying-fox (*Pteropus poliocephalus*), most recently recorded in 2013 (*EPBC Act* – Vulnerable; *BC Act* – Vulnerable);
- Masked Owl (*Tyto novaehollandiae*), most recently recorded in 2012 (*BC Act* – Vulnerable);
- Narrow-leaf Wiltonia (*Wiltonia backhousei*), most recently recorded in 2008 (*BC Act* – Vulnerable); and
- Migratory shorebird habitat for Bar-tailed Godwit (*Limosa lapponica*) and Curlew Sandpiper [(*Calidris ferruginea*); *EPBC Act* – Migratory].

### 1.4 Potential Opportunities for Ecology

A number of opportunities and objectives were identified during workshops which have helped frame the Master Plan including:

- Ecological regeneration as a key driver for the future identity and purpose of the Precinct;
- Ecological restoration as opportunity for connection with country;
- Opportunities for future development to also improve ecological outcomes as part of site development;
- Environmental management partnerships with industry;
- Large scale water management and quality improvements across the peninsula;
- The need for better environmental quality to support amenity, identity and change in the Precinct; and
- The need for green cover across the peninsula given deficits and the significant contribution this would make to the region.

## 1.5 Relevant Legislation and Policy

The key environmental legislation and policies that are of relevance are listed in **Table 1**.

**Table 1. Relevant Legislation and Policy Addressed.**

| Legislation/ Policy  | Relevant Ecological Feature on Site   | Triggered | Considerations  |
|--|---|-----------|---|
| <b>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth)</b> | <p>Mangrove and Saltmarsh habitat provides foraging habitat for <i>EPBC</i> listed threatened and migratory species.</p> <p>Three (3) threatened species listed under the EPBC Act have been historically recorded within the Precinct:</p> <ul style="list-style-type: none"> <li>• <i>Acacia pubescens</i> (Downy Wattle; Vulnerable);</li> <li>• <i>Litoria aurea</i> (Green and Golden Bell Frog; Vulnerable); and</li> <li>• <i>Pteropus poliocephalus</i> (Grey-headed Flying Fox; Vulnerable).</li> </ul> <p>The precautionary principle was utilised for sections of Swamp Oak Floodplain Forest and Coastal Saltmarsh as their condition could not be appropriately survey therefore, they have been assumed to meet the <i>EPBC</i> listing criteria for:</p> <ul style="list-style-type: none"> <li>• Endangered Ecological Communities: Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland endangered ecological community; and</li> <li>• Subtropical and Temperate Coastal Saltmarsh vulnerable ecological community.</li> </ul> | Yes       | An assessment of significance of impact from the proposed works on Matters of National Environmental Significance (MNES) against the <i>EPBC Act</i> Assessment of Significant Impact Criteria. This is to be included within the appropriate environmental impact assessment should future proposed works be likely to impact on any EPBC listed threatened species. |
| <b>Biosecurity Act 2015 (Bio Act) (Commonwealth)</b>   | <p>Four (4) priority weed for the Greater Sydney region was identified on the Precinct:</p> <ul style="list-style-type: none"> <li>• <i>Anredera cordifolia</i> (Madeira Vine);</li> <li>• <i>Cortaderia species</i> (Pampas Grass);</li> <li>• <i>Lantana camara</i> (Lantana); and</li> <li>• <i>Olea europaea subsp. cuspidata</i> (African Olive).</li> </ul>   | Yes       | Listed priority weeds must be managed in accordance with the <i>Biosecurity Act 2015</i> .  |
| <b>Environmental Planning and Assessment Act 1979 (EP&amp;A Act) (New South Wales)</b>         | <p>The EP&amp;A Act is the primary land use planning statute in NSW. It governs matters such as planning administration, planning instruments (state environmental planning policies (SEPPs) and local environmental plans (LEPs), development assessments, building certification, infrastructure finance, appeals and enforcement.</p> <p>Objectives of the Act relevant to the Precinct:</p> <ul style="list-style-type: none"> <li>• to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats; and</li> <li>• to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.</li> </ul>  | Yes       | Future developments will be required to provide the appropriate environmental impact assessment depending on which assessment pathway is followed under this act.   |

| Legislation/ Policy  | Relevant Ecological Feature on Site   | Triggered | Considerations  |
|--|---|-----------|---|
| <b>Biodiversity Conservation Act (BC Act) (New South Wales)</b>  | <p>Six (6) threatened species listed under the BC Act have been historically recorded within the Precinct:</p> <ul style="list-style-type: none"> <li>▪ <i>Acacia pubescens</i> (Downy Wattle; Vulnerable);</li> <li>▪ <i>Pandion cristatus</i> (Eastern Osprey; Vulnerable);</li> <li>▪ <i>Litoria aurea</i> (Green and Golden Bell Frog; Endangered);</li> <li>▪ <i>Pteropus poliocephalus</i> (Grey-headed Flying Fox; Vulnerable);</li> <li>▪ <i>Tyto novaehollandiae</i> (Masked Owl; Vulnerable); and</li> <li>▪ <i>Wilsonia backhousei</i> (Narrow-leaved Wilsonia; Vulnerable).</li> </ul> <p>Three (3) endangered ecological communities listed under the BC Act have been historically mapped within the Precinct:</p> <ul style="list-style-type: none"> <li>▪ Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregion;</li> <li>▪ Sydney Freshwater Wetlands in the Sydney Basin Bioregion; and</li> <li>▪ Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions.</li> </ul> | Yes       | A Test of Significance or offsets may be required for any works that impact on threatened entities under the BC Act. Depending on the nature of the development this will be included within a Flora and Fauna Assessment Report (FFA), Biodiversity Development Assessment Report (BDAR) or Review of Environmental Factors (REF). |
| <b>Fisheries Management Act 1994 (FM Act) (New South Wales) and DPI Fisheries Policy and Guidelines for Fish Habitat Conservation Management (2013).</b>         | <p>Mangrove and Saltmarsh habitat was recorded within the Presinct which is listed as marine vegetation under Part 7, Division 4 of the <i>FM Act</i>.<br/>Parramatta River and Duck River is listed as Key Fish Habitat under the <i>FM Act</i>.</p>   | Yes       | A permit will need to be acquired from the Department of Primary Industries for any works that will impact on the marine vegetation or key fish habitat. Consideration should also be given to the policy guidelines.   |
| <b>Water Management Act 2000 (New South Wales) and Natural Resources Access Regulator (NRAR) Guidelines for Controlled Activities on Waterfront Land (2018).</b> | Parramatta River, Duck River, Duck Creek and A'becketts Creeks and their associated riparian corridors are mapped as occurring on the fringes of the Precinct.  | Yes       | Works occurring within waterfront land (40m of each bank) of each watercourse are considered a Controlled Activity under the <i>WM Act</i> . Applicants must obtain a controlled activity approval from the NRAR before commencing the controlled activity.   |
| <b>State Environmental Planning Policy (Biodiversity and Conservation) 2021- Chapter 6: Bushland in Urban Areas</b>  | Sections of the Precinct contain areas zoned for public recreation.   | Yes       | Future developments within or neighbouring on lands zoned for public recreation may be required to prepare a plan of management to protect and preserve bushland.   |

| Legislation/ Policy   | Relevant Ecological Feature on Site  | Triggered | Considerations  |
|---|--|-----------|---|
| <b>State Environmental Planning Policy (Biodiversity and Conservation) 2021- Chapter 10: Sydney Harbour Catchment</b> | The Precinct is located within the Sydney Harbour Catchment Area. Sections of the Precinct are located within the Foreshores and Waterways Areas Boundary and wetland protection area. Parramatta River is zoned W1 Maritime Waters and Duck River and Creek and A'Becketts Creek is zoned W2 Environmental Protection. as mapped by this chapter of the SEPP  | Yes       | Future developments must take into account the objectives and controls of this relevant to these areas.                 |
| <b>State Environmental Planning Policy (Resilience and Hazards) 2021 - Chapter 2: Coastal Management</b>              | The Precinct is mapped as containing areas mapped as ( <b>Figure 3</b> ): <ul style="list-style-type: none"> <li>▪ Coastal Wetlands;</li> <li>▪ Proximity to Coastal Wetlands;</li> <li>▪ Coastal Environment Area; and</li> <li>▪ Coastal Use Area.</li> </ul>  | Yes       | Future works within these areas must be conducted in accordance with the relevant controls of this chapter of the SEPP. |
| <b>Parramatta Local Environmental Plan (LEP) 2011</b>   | The Parramatta LEP guides future planning decisions for through zoning and development controls. In addition to zoning areas of the wetland is mapped as “Biodiversity” and as “Riparian Land and Waterways”. The LEP also maps the foreshore area (foreshore area means the land between the foreshore building line and the mean high water mark of the nearest bay or river) and maps the wetlands and mangroves as heritage. | Yes       | Future developments must take into account the relevant objectives and controls of the LEP.                             |



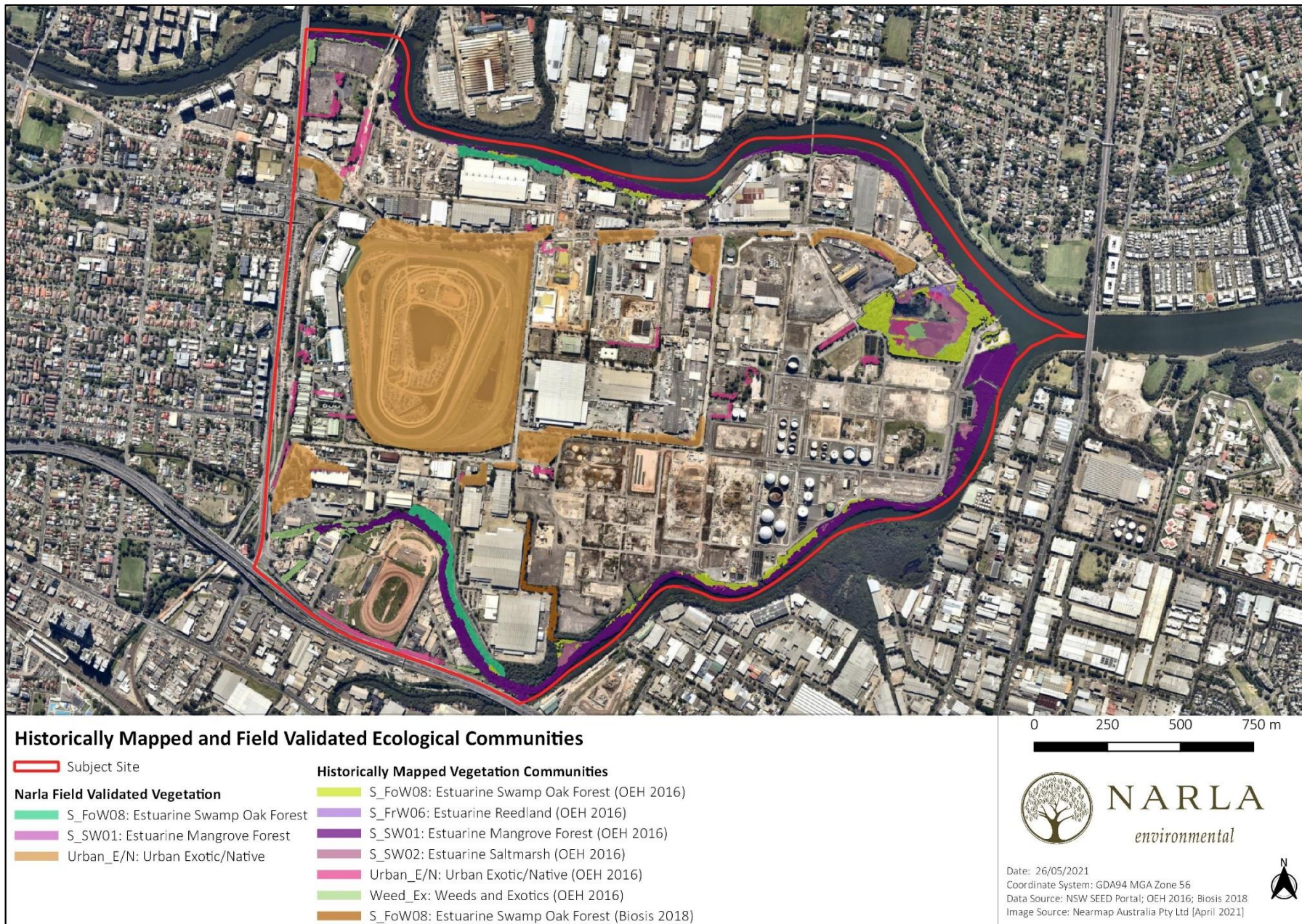


Figure 1. Historically mapped and field validated ecological communities within the Precinct.



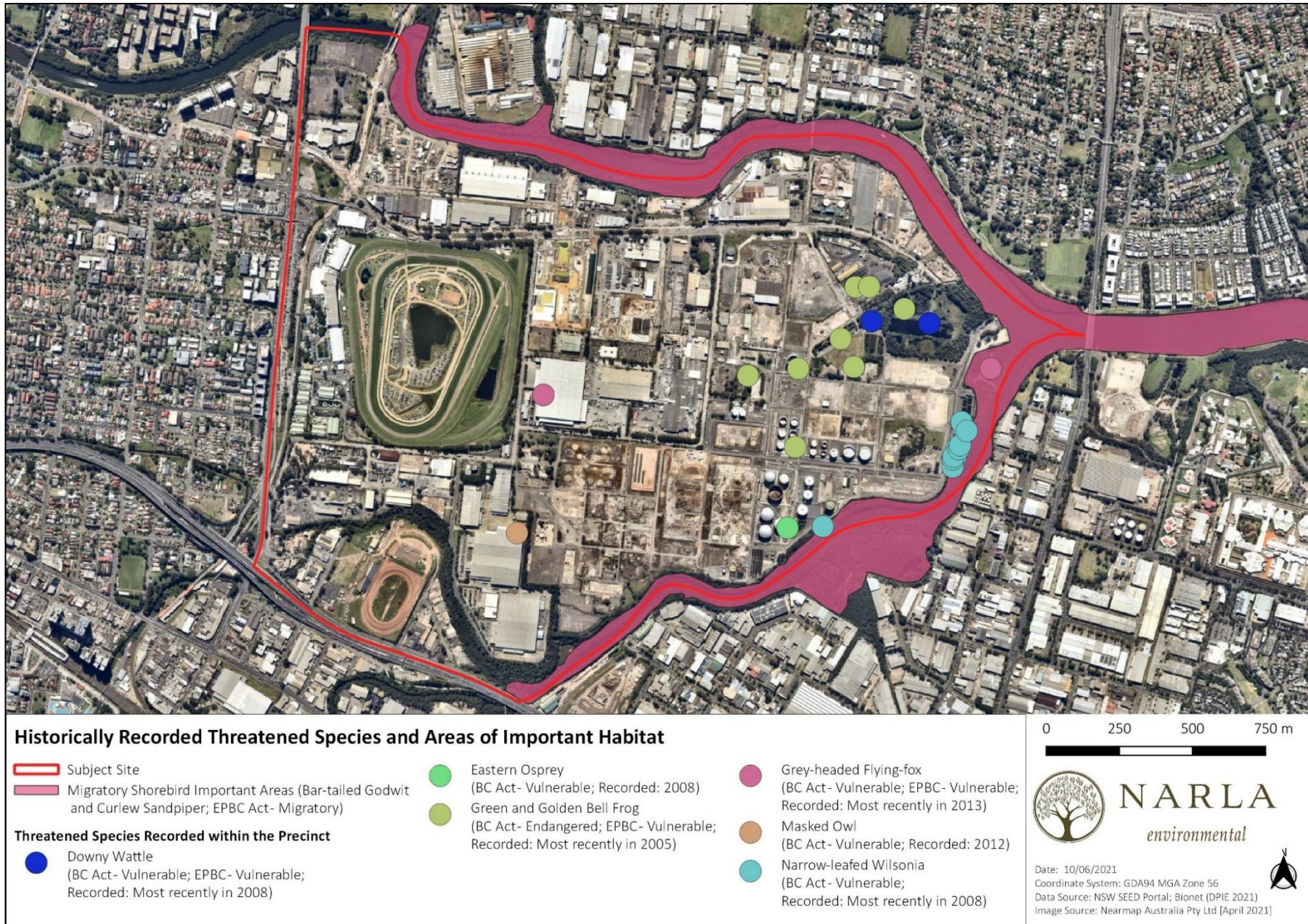
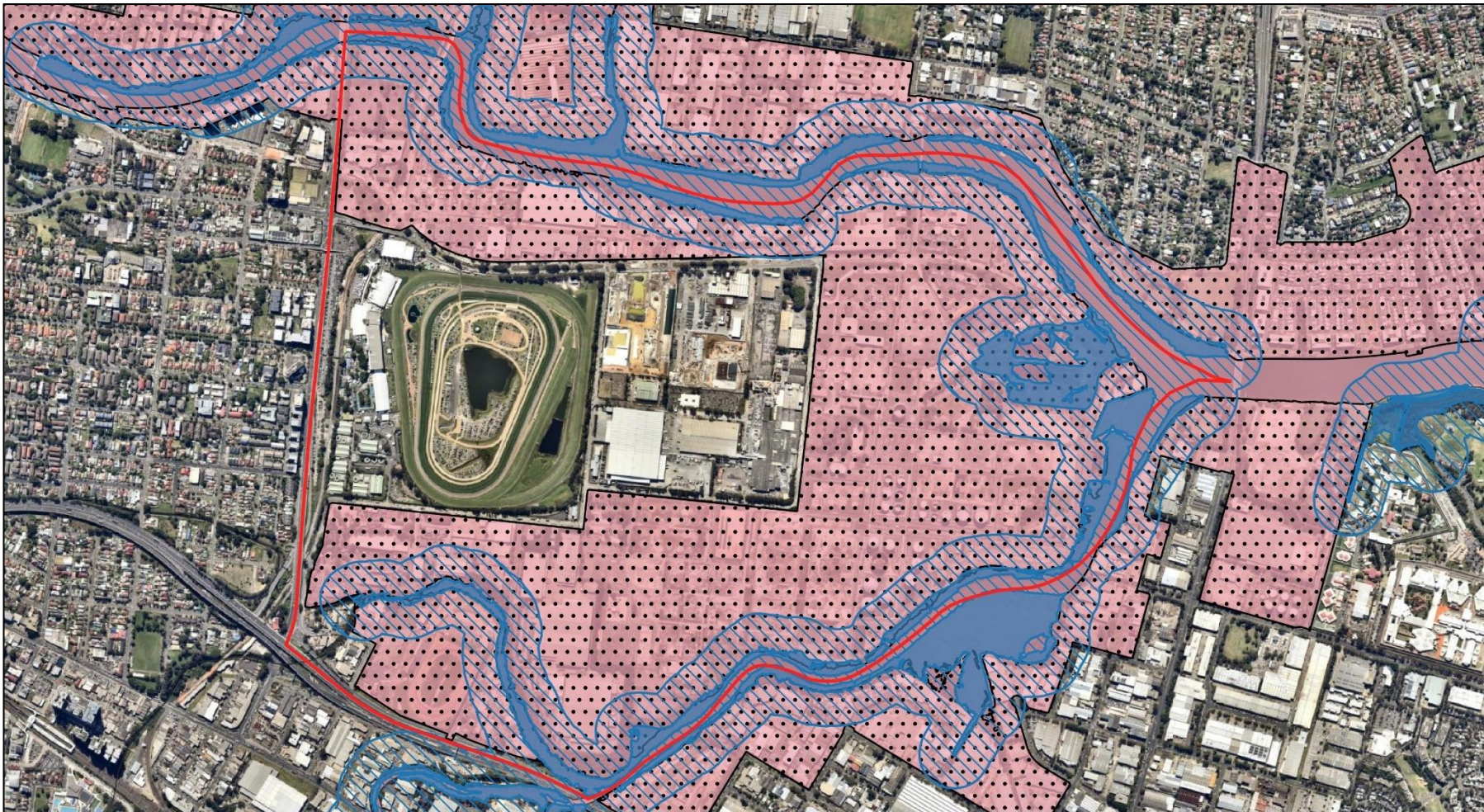


Figure 2. Threatened species historically recorded within the Precinct.





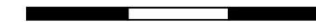
**State Environmental Planning Policy (Resilience and Hazards) 2021 - Chapter 2: Coastal Management**

 Subject Site

**State Environmental Planning Policy (Resilience and Hazards) 2021 - Chapter 2: Coastal Management**

-  Coastal Wetlands
-  Proximity Area for Coastal Wetlands
-  Coastal Environment Area
-  Coastal Use Area

0 250 500 750 m



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environmental

Date: 02/06/2022  
 Coordinate System: GDA94 MGA Zone 56  
 Data Source: NSW SEED Portal; DPIE 2022  
 Image Source: Nearmap Australia Pty Ltd [April 2021]



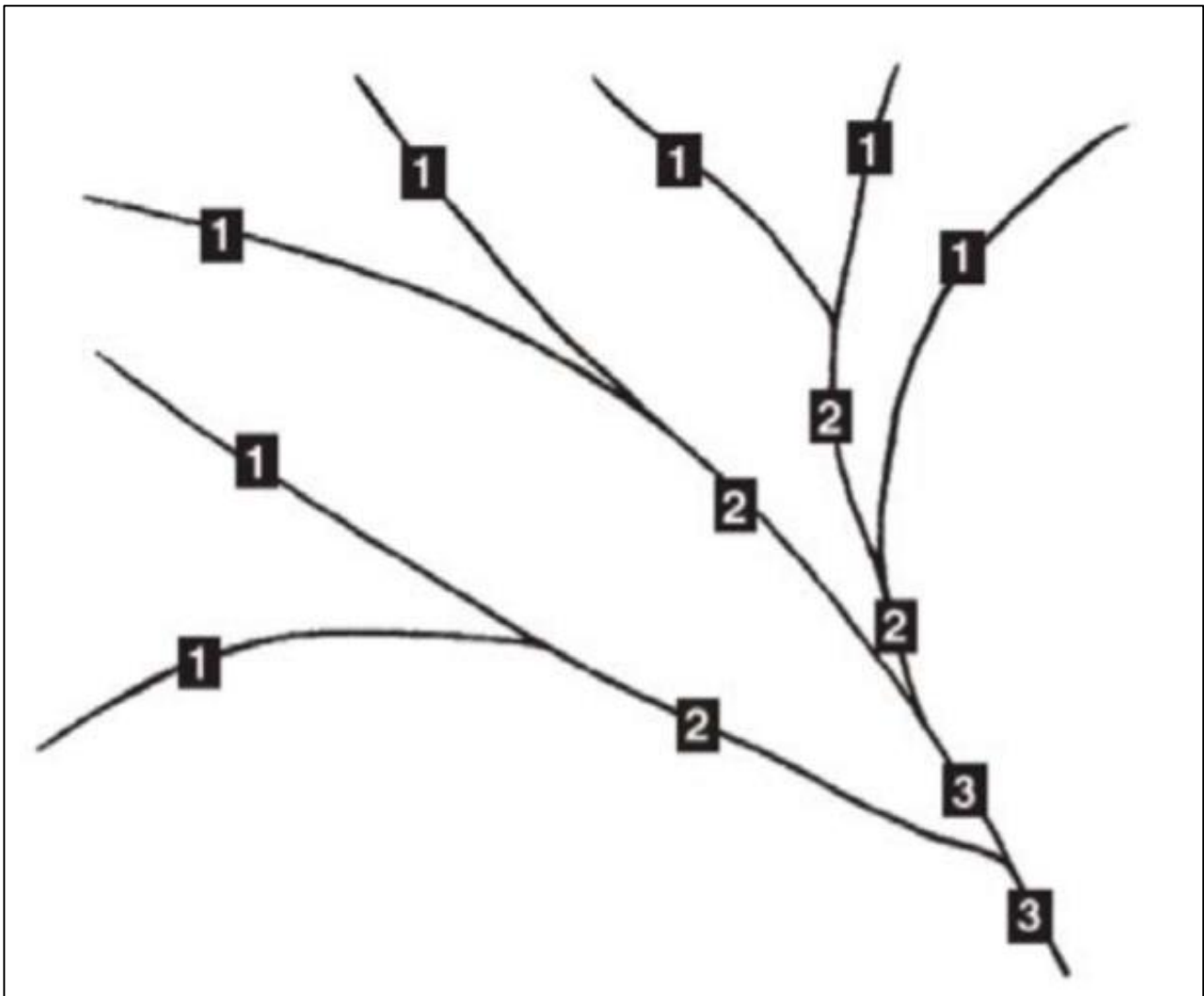
Figure 3. Areas within the Precinct associated with chapter 2 (Coastal Management) of the Resilience and Hazards SEPP 2021.



### 1.5.1 Waterfront Land and Vegetated Riparian Zones under the Water Management Act 2000

Controlled activities carried out in, on, or under waterfront land are regulated by the *Water Management Act 2000* (WM Act). The Natural Resources Access Regulator (NRAR) administers the *WM Act* and is required to assess the impact of any proposed controlled activity to ensure that no more than minimal harm will be done to waterfront land as a consequence of carrying out the controlled activity. Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary.

The Strahler Stream Order system is used to describe the hierarchy of streams from the top to the bottom of a catchment. It is based on the joining of streams of the same order to create the next order of streams as shown in **Figure 4** (DPI 2018). Each stream order has an associated riparian buffer e.g., 1<sup>st</sup> order streams have a 10m riparian buffer, 2<sup>nd</sup> order streams a 20m buffer etc. Impacts to vegetation within these Vegetated Riparian Zones (VRZ) may warrant the need to produce a Vegetation Management Plan.



**Figure 4. Schematic diagram of Strahler System.**

Utilising the Strahler System, the Precinct contains four (4) mapped watercourses and their associated riparian buffers including the 4<sup>th</sup> order Parramatta River in the north, 3<sup>rd</sup> order Duck River to the east and south east, 2<sup>nd</sup> order Duck Creek to the south as well the 1<sup>st</sup> order A'becketts creek in the south western corner (**Figure 5**). There are also four dams within the Rosehill Racecourse, with an additional unmapped waterbody located within the eastern extern of the Precinct.

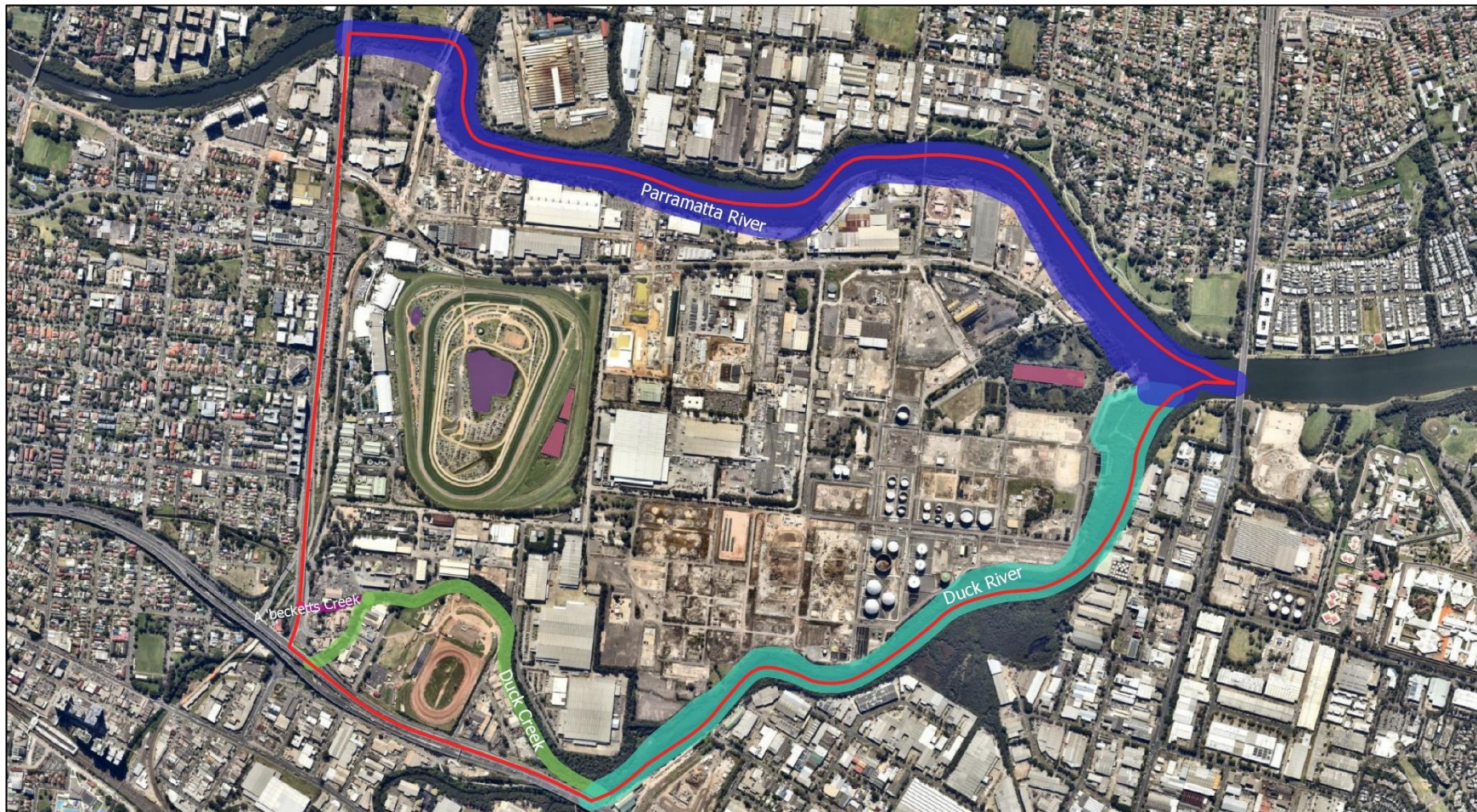
### 1.5.1.1 Riparian Corridor Matrix

The riparian corridor matrix enables applicants to identify certain works and activities that can occur on waterfront land and in riparian corridors (**Table 2**). Applicants should note that the matrix relates to controlled activity approvals under the WM Act only. Applicants are still required to comply with other relevant government legislation, such as threatened species, flood planning levels and fisheries guidelines.

**Table 2. Riparian Corridor Matrix (DPI 2018)**

| Stream Order    | Vegetated Riparian Zone (VRZ) | Riparian Corridor (RC) offsetting for non-RC users | Cycleways and paths | Detention basins          |        | Stormwater outlet structures and essential services | Stream alignment | Road Crossings |         |        |
|-----------------|-------------------------------|--|---------------------|---------------------------|--------|---|------------------|----------------|---------|--------|
|                 |                               |  |                     | Only within 50% outer VRZ | Online |   |                  | Any            | Culvert | Bridge |
| 1 <sup>st</sup> | 10m                           | Yes  | Yes                 | Yes                       | Yes    | Yes   | Yes              | Yes            | No      | No     |
| 2 <sup>nd</sup> | 20m                           | Yes  | Yes                 | Yes                       | Yes    | Yes   | No               | Yes            | No      | No     |
| 3 <sup>rd</sup> | 30m                           | Yes  | Yes                 | Yes                       | No     | Yes   | No               | No             | Yes     | Yes    |
| 4 <sup>th</sup> | 40m                           | Yes  | Yes                 | Yes                       | No     | Yes   | No               | No             | Yes     | Yes    |





**Waterbodies and Approximate Vegetated Riparian Zones**

- The Precinct
- Mapped Waterbodies
- Unmapped Waterbodies

**Strahler Streams and Approximate Vegetated Riparian Zones**

- 1st order stream and associated 10m riparian buffer
- 2nd order stream and associated 20m riparian buffer
- 3rd order stream and associated 30m riparian buffer
- 4th order stream and associated 40m riparian buffer

0 250 500 750 m



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 Coordinate System: GDA94 MGA Zone 56  
 Data Source: NSW SEED Portal; SIX Maps 2022  
 Image Source: Nearmap Australia Pty Ltd [April 2021]



Figure 5. Waterbodies and Approximate VRZ's within the Precinct



## 2. Master Plan

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### 2.1 Vision

Camellia-Rosehill has an important strategic role as an industry and employment hub within the Greater Parramatta and Olympic Peninsula (GPOP) Economic Corridor. By 2041, the precinct will be enhanced with service and circular economy industries and new recreational and entertainment facilities, all enabled by better transport access via light rail, active transport and road connections.

A well-designed town centre next to the light rail stop will be the focus of community activity. A new urban services precinct and retention of heavy industrial land will ensure Camellia-Rosehill fulfills its potential to be an employment powerhouse. New homes and jobs will be close to public transport supported by new quality public spaces including public open spaces, public facilities high quality street infrastructure, and walking and cycling paths.

Key environmental features such as Parramatta River, Duck River and their wetlands will be protected and enhanced. Camellia's rich heritage will be preserved, celebrated and promoted. Country and culture will be valued and respected with the renewal guided by Aboriginal people.

The precinct will be net zero ready and set a new standard for environmental sustainability with embedded renewable energy networks, integrated remediation and water management strategies, and circular economy industries. Recycled water will be connected to all residences, businesses and public spaces and will support the integrated network of green infrastructure.

Camellia will be a showcase of recovery and restoration – a place of economic prosperity but also a place where people love to live, work and enjoy.

### 2.2 The Camellia-Rosehill Master Plan

The Master Plan is shown in **Figure 6** and forms the basis of the Place Strategy.

Key features of the master plan include:

- Provision for approximately 10,000 dwellings within a Town Centre serviced by light rail;
- Provision for approximately 15,400 jobs;
- A new primary school and primary and secondary high school;
- District open space facilities;
- Introduction of a new entertainment precinct and an urban services area;
- Initiatives to Care for Country and continued protection of heritage listed sites;
- Retention of the existing state heritage sewerage pumping station (SPS) 067 within the town centre;
- Measures to mitigate land use conflicts and risks including buffers and setbacks from existing fuel pipelines and between the existing sewerage pumping station and future surrounding residential uses;
- Access to the Parramatta River, Duck River and Duck Creek foreshores and potentially the wetland;
- New transport infrastructure including a local road network, potential bus services, additional connections into and out of the Precinct, and opportunities to integrate with Parramatta Light Rail Stage 2;
- An extensive active transport network;
- A comprehensive remediation strategy; and
- A sustainability strategy and integrated water cycle management strategy.



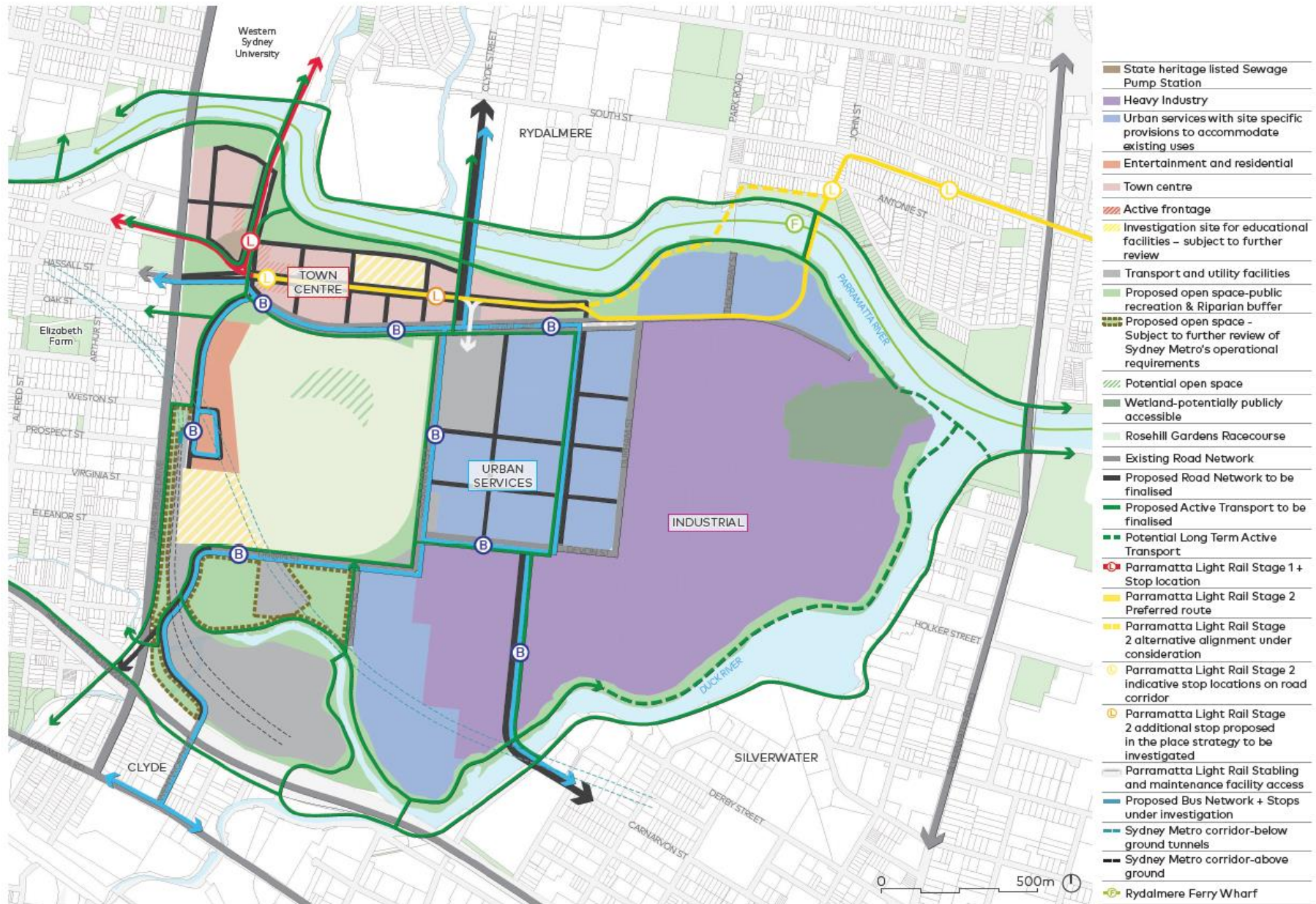


Figure 6. Master plan diagram, showing proposed land uses, movement and access across the Precinct.

## 2.3 Ecological impacts

### 2.3.1 Direct Impacts

The proposed transport crossings (**Figure 6**) over Parramatta River in the north and Duck River in the south of the Precinct are likely to require the removal of mangrove vegetation and shorebird habitat (mudflats) to facilitate. Development. Any impacts to mangrove vegetation will require a permit and approval from the Department of Primary Industries (Fisheries) and the likely preparation of mangrove restoration plan.

The proposed land uses under the Master Plan (**Figure 6**), in particular the proposed establishment of the urban services and primary school, will be located in close proximity to areas of *EPBC Act* and *BC Act* listed Estuarine Swamp Oak Forest (**Figure 7**). Future developments in these sections should be conducted in a manner that does not require the removal of this community. Further removal may result in a significant impact on this community within the locality. These areas of vegetation should be protected as part of the overall place strategy.

### 2.3.2 Prescribed Impacts

Certain projects may have impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. For many of these impacts, the biodiversity values may be difficult to quantify, replace or offset, making avoiding and minimising impacts critical. Prescribed biodiversity on the potential impacts on the habitat of threatened species or ecological communities associated with the Master Plan is discussed in **Table 3**. More detailed assessments and considerations will be required for any potential future DAs.

**Table 3. Prescribed and uncertain impacts associated with the Master Plan.**

| Is there likely to be impacts on any of the following?   | Likelihood of Increased Impact (relative to current land use) | Explanation   |
|--|---|---|
| Habitat of threatened entities including: <ul style="list-style-type: none"> <li>▪ karst, caves, crevices, cliffs, rocks and other geological features of significance, or</li> <li>▪ human-made structures, or</li> <li>▪ non-native vegetation.</li> </ul> | Yes   | There are no karsts, caves, crevices, cliffs, rocks and other features of geological significance within the Precinct.<br><br>The Precinct contains a number of occupied and unoccupied buildings that may be required to be demolished as part of the Master Plan. A number of threatened microbat species may utilise these human-made structures for roosting and/or breeding, including: <ul style="list-style-type: none"> <li>▪ <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle);</li> <li>▪ <i>Micronomus norfolkensis</i> (Eastern Coastal Free-tailed Bat);</li> <li>▪ <i>Miniopterus australis</i> (Little Bent-winged Bat);</li> <li>▪ <i>Miniopterus orianae oceanensis</i> (Large Bent-winged Bat);</li> <li>▪ <i>Saccolaimus flaviventris</i> (Yellow-bellied Sheath-tail-bat); and</li> </ul> |

| Is there likely to be impacts on any of the following?  | Likelihood of Increased Impact (relative to current land use) | Explanation   |
|---|---|---|
|   |   | <ul style="list-style-type: none"> <li>▪ <i>Scoteanax rueppellii</i> (Greater Broad-nosed Bat).</li> </ul> <p>Non-native vegetation in the form of exotic grass areas and landscaped vegetation was present within the Precinct. As this vegetation provides the majority of the foraging habitat within the core of the Precinct, large scale removal may impact potentially occurring threatened species.</p>   |
| On areas connecting threatened species habitat, such as movement corridors.   | No  | Despite the likely removal of select areas of native and exotic vegetation, the proposed introduction of new areas of open space as well as the implementation of a Greening strategy which would provide at least 25% canopy cover across the Precinct (Kinesis 2021) will result in a likely improvement of connectivity across the Precinct.   |
| That affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining). | Yes   | <p>Four ecological communities located within the Precinct are influenced by hydrological processes:</p> <ul style="list-style-type: none"> <li>▪ Estuarine Swamp Oak Forest (EPBC Act – Endangered; BC Act – Endangered);</li> <li>▪ Estuarine Mangrove Forest (FM Act – Protected);</li> <li>▪ Estuarine Reedland (BC Act – Endangered); and</li> <li>▪ Estuarine Saltmarsh (EPBC Act – Vulnerable; BC Act – Endangered; FM Act – Protected).</li> </ul> <p>The Master Plan will likely require the removal of areas of mangrove vegetation and has the potential to increase runoff, contamination and impacts to groundwater systems which may negatively impact on the ecological communities present within the Precinct who depend on them.</p> <p>The remediation strategy proposed for the Precinct (Golder 2021), as well as the greening strategy (Kinesis 2021) are likely to substantially mitigate impacts associated with tree loss and contamination which would result in an overall improvement of the condition of the Precinct.</p> |

| Is there likely to be impacts on any of the following?                      | Likelihood of Increased Impact (relative to current land use) | Explanation   |
|---|---|---|
| On threatened species or fauna that are part of a TEC from vehicle strikes. | Yes   | The existing Precinct has a high level of vehicle traffic and the Master Plan is unlikely to significantly increase this. |






**Protected Vegetation with Potential to be Impacted by Future Works**

 The Precinct

**Narla Field Validated Vegetation**

 S\_FoW08: Estuarine Swamp Oak Forest

**Historically Mapped Vegetation Communities**

 S\_FoW08: Estuarine Swamp Oak Forest (Biosis 2018)

 Wetland and Mangrove Vegetation (SREP 2005)

 S\_FoW08: Estuarine Swamp Oak Forest (OEH 2016)

 S\_FrW06: Estuarine Reedland (OEH 2016)

 S\_SW02: Estuarine Saltmarsh (OEH 2016)

0 250 500 750 m



**NARLA**  
environmental

Date: 02/05/2022  
 Coordinate System: GDA94 MGA Zone 56  
 Data Source: NSW SEED Portal; OEH 2016; Biosis 2018  
 Image Source: Nearmap Australia Pty Ltd [April 2021]



Figure 7. Protected vegetation with potential to be impact by future works using the precautionary principle, under the Master Plan.



### 2.3.3 Indirect Impacts (Negatives and Positives)

Indirect impacts occur when the construction or operation of a development affect native vegetation, threatened ecological communities and threatened species habitat beyond the areas being directly impacted. Indirect impacts may also result from changes to land-use patterns, such as an increase in vehicular access and human activity on native vegetation, threatened ecological communities and threatened species habitat. The potential indirect impacts (positive and negative) associated with the Master Plan are outlined in **Table 4**. All indirect impacts that will result in a negative outcome will be required to be assessed in more depth for any future DA submissions within the Precinct.

**Table 4. Indirect impacts associated with the Master Plan.**

| Potential Indirect Impact                   | Extent   | TEC's and/or Threatened Species and Their Habitat with potential to be Impacted  | Potential Negative Impacts (relative to current land use)  | Potential Positive Impacts (relative to current land use)  |
|---|--|--|--|--|
| (a) Areas of adjacent habitat or vegetation | <p>Vegetation and habitat directly adjacent to any proposed works has the potential to experience ongoing indirect impacts as a result of the Master Plan. The disturbance caused during construction may increase weed infestations within adjacent vegetation, which in turn would decrease its habitat value. In the Master Plan this becomes increasingly more likely in areas of vegetation bordering heavy industrial activities (e.g., Viva Energy), and the areas immediately surrounding the proposed Parramatta and Duck River Crossings.</p> <p>The riparian buffer however, surrounding the Precinct will help reduce inadvertent impacts on the adjacent foreshore habitat and vegetation excluding areas in the immediate vicinity of the proposed crossing.</p> | <p>Estuarine Swamp Oak Forest (EPBC Act – Endangered; BC Act – Endangered)</p> <p>Estuarine Mangrove Forest (FM Act – Protected)</p> <p>Estuarine Reedland (BC Act – Endangered)</p> <p>Estuarine Saltmarsh</p> <p>In addition, there are numerous threatened and migratory species that have been recorded within the Precinct that may be impacted by inadvertent impacts on adjacent habitat.</p> | <p>There is potential for areas of vegetation situated in the vicinity of areas proposed for development to see a reduction in habitat viability. This, however, is not expected to be a significant decrease owing to the already heavily disturbed nature of the Precinct.</p> | <p>The establishment of the riparian buffer around the Precinct will significantly reduce the inadvertent impacts that the foreshore environment is currently experiencing, by providing a buffer area between the vegetation and surrounding land uses.</p> |
| (b) Edge Effects                            | <p>Future construction and on-going operations may lead to an increase in weed infiltration into adjacent habitats due to enhanced edge effects.</p>   | <p>Estuarine Swamp Oak Forest (EPBC Act – Endangered; BC Act – Endangered)</p>   | <p>There is potential for areas of vegetation situated in the vicinity of areas proposed for development to see an increase in</p>   | <p>Edge effects within the Precinct are likely to be reduced as a result of the Master Plan, due to the increased areas of foreshore</p>   |



| Potential Indirect Impact                          | Extent  | TEC's and/or Threatened Species and Their Habitat with potential to be Impacted   | Potential Negative Impacts (relative to current land use)  | Potential Positive Impacts (relative to current land use)   |
|--|---|---|--|---|
|  | <p>The areas with the greatest potential to experience increased edge effects as a result of the Master Plan are the wetland, mangrove vegetation and mudflat habitat along Parramatta River and Duck River, located in the vicinity of the proposed crossings.</p>   | <p>Estuarine Mangrove Forest (FM Act – Protected)</p> <p>Estuarine Reedland (BC Act – Endangered)</p> <p>Estuarine Saltmarsh</p> <p>In addition, numerous threatened and migratory species have been confirmed within the Precinct. These protected species may be impacted by edge effects leading to a reduced viability in habitat.</p>            | <p>edge effects. This, however, is not expected to be a significant decrease owing to the already heavily disturbed nature of the Precinct.</p>  | <p>habitat and other open spaces to be created which will result in greater management of these areas.</p>  |
| (c) Habitat Viability (noise, dust or light spill) | <p>It is not anticipated that there will be an increase in these factors by Master Plan. The heavily industrial nature of the Precinct is already experiencing high levels of noise, dust and light spill into the remaining areas of habitat present within the Precinct. The introduction of the riparian buffer is likely to improve foreshore habitat viability excluding areas in the immediate vicinity of the proposed crossing.</p> | <p>Estuarine Swamp Oak Forest (EPBC Act – Endangered; BC Act – Endangered)</p> <p>Estuarine Mangrove Forest (FM Act – Protected)</p> <p>Estuarine Reedland (BC Act – Endangered)</p> <p>Estuarine Saltmarsh</p> <p>In addition, numerous threatened and migratory species have been confirmed within the Precinct. These protected species may be</p> | <p>There is potential for areas of vegetation situated in the vicinity of areas proposed for development to see a reduction in habitat viability. This, however, is not expected to be a significant decrease owing to the already heavily disturbed nature of the Precinct.</p> | <p>The implementation of a riparian buffer surrounding the Precinct is likely to significantly improve the viability of the foreshore habitat outside of the areas in the vicinity of the proposed crossings. The implementation of the greening strategy and the creation of new vegetation corridors has the potential to reduce the immediate impacts of dust.</p> |

| Potential Indirect Impact                                     | Extent  | TEC's and/or Threatened Species and Their Habitat with potential to be Impacted   | Potential Negative Impacts (relative to current land use)  | Potential Positive Impacts (relative to current land use)   |
|---|---|---|--|---|
|   |   | impacted by noise, dust or light spill leading to a reduced viability in habitat.   |  |   |
| (d) Transport of weeds and pathogens                          | <p>Future construction and continued land use may lead to an increase in weed infiltration into adjacent habitat due to enhanced edge effects.</p> <p>The most likely area to experience increased edge effects as a result of the Master Plan is the mangrove vegetation and mudflat habitat along Parramatta River and Duck River, located in the vicinity of the proposed crossings.</p> | <p>Estuarine Swamp Oak Forest (EPBC Act – Endangered; BC Act – Endangered)</p> <p>Estuarine Mangrove Forest (FM Act – Protected)</p> <p>Estuarine Reedland (BC Act – Endangered)</p> <p>Estuarine Saltmarsh</p> <p>In addition, numerous threatened and migratory species have been confirmed within the Precinct. These protected species may be impacted by the transport of weeds and pathogens leading to a reduced viability in habitat.</p> | <p>There is potential for areas of vegetation situated in the vicinity of areas proposed for development to see an increase in the presence of weeds and pathogens. This, however, is not expected to be a significant decrease owing to the already heavily disturbed nature of the Precinct.</p> | NA  |
| (e) Risk of starvation, exposure and loss of shade or shelter | <p>The removal of areas of vegetation to accommodate certain land uses has the potential to increase exposure for threatened fauna within the Precinct. However, the creation of a riparian buffer and revegetation through the proposed</p>  | <p>Numerous threatened and migratory species have been confirmed within the Precinct. These protected species may be impacted by the increased risk of starvation, exposure and loss of</p>   | <p>Due to the areas of vegetation still present around the periphery of the Precinct, it is unlikely that this impact will be significant as such habitats will continue to provide</p>  | <p>The implementation of the proposed greening strategy as well as the creation of the riparian buffer will result in a significant</p> |

| Potential Indirect Impact                 | Extent  | TEC's and/or Threatened Species and Their Habitat with potential to be Impacted | Potential Negative Impacts (relative to current land use)  | Potential Positive Impacts (relative to current land use)  |
|---|---|---|--|--|
|   | greening strategy is likely to significantly mitigate this risk.  | shade or shelter leading to a reduced viability in habitat.                     | food resources and shelter for fauna species.  | increase in available habitat across the Precinct.   |
| (f) Breeding habitats                     | Historical records do indicate a population of Green and Golden Bell Frogs within the Precinct as recently as 2008. Furthermore, important migratory shorebird habitat is mapped as occurring along Parramatta River and Duck River.  | Green and Golden Bell Frogs<br>Migratory Shorebirds                             | Due to the already highly disturbed nature of the Precinct, it is unlikely that areas outside of the wetland are being utilised as breeding habitat. However, if the population of Green and Golden Bell Frogs present continue to experience indirect impacts from heavy industries in the surrounding areas it could result in the reduction or loss of breeding habitat. There is also the potential for areas of migratory shorebird habitat to be impacted in the areas immediately surrounding the proposed pedestrian and road crossings. | The continued protection and restoration of the wetland area, will result in the conservation of the most suitable area of potential Green and Golden Bell Frog breeding habitat. The implementation of the 40m riparian buffer surrounding the Precinct, will reduce indirect impacts to important foreshore habitat. |
| (g) Trampling of threatened flora species | Two (2) threatened flora species (Downy Wattle and Narrow-leaf Wilsonia) have been historically identified within the Precinct.<br><br>The most likely area to experience an increased risk of trampling in the Master Plan, is the mangrove vegetation and mudflat habitat along Parramatta River and Duck River, located in the vicinity of the | Downy Wattle<br>Narrow-leaf Wilsonia  | The utilisation of the foreshore has the potential to impact areas of potential habitat for these species.   | The area for foreshore utilisation currently proposed in the Master Plan does not currently intersect areas where these species have been historically recorded. If long-term active transport is proposed targeted surveys should be conducted to confirm there   |

| Potential Indirect Impact                         | Extent  | TEC's and/or Threatened Species and Their Habitat with potential to be Impacted  | Potential Negative Impacts (relative to current land use)  | Potential Positive Impacts (relative to current land use) |
|---|---|--|--|---|
|   | proposed crossings and foreshore utilisation for pedestrians.   |  |  | locations and ensure they are appropriately protected.    |
| (h) Nitrogen fixation and increased soil salinity | It is unlikely that the inhibition of nitrogen fixation will affect vegetation adjacent to the Precinct based on the Master Plan.                           | N/A  | Negligible   | Negligible  |
| (i) Fertiliser drift                              | This issue is not likely to affect the vegetation within or surrounding the Precinct based on the Master Plan.  | N/A  | Negligible   | Negligible  |
| (j) Rubbish dumping                               | Due to the potential increase in population numbers proposed under the Master Plan, there is a likelihood that occurrences of rubbish dumping may increase. | Numerous threatened and migratory species have been confirmed within the Precinct. These protected species may be impacted by the increased rubbish dumping leading to a reduced viability in habitat. | Due to the already heavily disturbed nature of the Precinct, it is unlikely that the Master Plan would result in an extensive enough increase in rubbish dumping such that any threatened or protected species were likely to be significantly impacted. | NA  |
| (k) Wood collection                               | This issue is not likely to affect the vegetation within or surrounding the Precinct based on the Master Plan.  | N/A  | Negligible   | Negligible  |

| Potential Indirect Impact             | Extent  | TEC's and/or Threatened Species and Their Habitat with potential to be Impacted  | Potential Negative Impacts (relative to current land use)   | Potential Positive Impacts (relative to current land use) |
|---------------------------------------|---|--|---|---|
| (l) Bush rock removal and disturbance | No areas of bush rock is proposed to be removed based on the Master Plan.   | N/A  | Negligible  | Negligible  |
| (m) Predatory species                 | There is the possibility that other indirect impacts, such as rubbish dumping, which may be increased under the Master Plan may encourage predatory species into the area.  | Numerous threatened and migratory species have been confirmed within the Precinct. Such species may be impacted by an increase in predatory species populations. | The introduction of the riparian buffer, as well as the greening strategy has the potential to increase the occurrences of predatory pest species due to the increase in potential habitat and cover. However, it is unlikely to be a significant increase due to the nature of the site. | NA  |
| (n) Pest species                      | There is the possibility that other indirect impacts, such as rubbish dumping may be increased under the Master Plan, may result in an increase in pest animal populations. | Numerous threatened and migratory species have been confirmed within the Precinct. Such species may be impacted by an increase in pest animal populations.       | The introduction of the riparian buffer, as well as the greening strategy has the potential to increase the occurrences of predatory pest species due to the increase in potential habitat and cover. However, it is unlikely to be a significant increase due to the nature of the site. | NA  |
| (o) Risk of fire                      | It is unlikely that the Master Plan will result in an increased risk of fire.   | N/A  | Negligible  | Negligible  |

| Potential Indirect Impact   | Extent   | TEC's and/or Threatened Species and Their Habitat with potential to be Impacted   | Potential Negative Impacts (relative to current land use)   | Potential Positive Impacts (relative to current land use)  |
|---|--|---|---|--|
| (p) Specialist breeding and foraging habitat, e.g., beach nesting for shorebirds. | Shorebird habitat is currently present in the mangrove mudflats around the periphery of the Precinct. The Parramatta River and Duck River crossings, as well the proposed utilisation of the foreshore for pedestrians has the potential to disturb this habitat. Introduction of the riparian buffer is likely to improve foreshore habitat viability excluding areas in the immediate vicinity of the proposed crossing. | Migratory shorebirds  | The Parramatta and Duck River Crossings have the potential to negatively impact foreshore habitat for migratory shorebirds.   | Excluding areas for the proposed crossings. The implementation of the riparian buffer will improve the viability of specialist shorebird habitat available around the periphery of the Precinct, by reducing potential negative indirect impacts associated with surrounding land uses.. |
| (q) Vehicle movement.   | Future use of the land does have the potential to impact upon threatened species located within the adjacent habitat as a result of intensified vehicle movement.  | Numerous threatened and migratory species have been confirmed within the Precinct. Such species may be impacted by the intensification of vehicle movement. | Due to the current nature of the Precinct and high levels of constant vehicle movement, it is not anticipated that intensification of vehicle movement would significantly impact threatened species. | NA   |



## 2.4 Ecological Opportunities and Benefits

### 2.4.1 Wetland

The wetland area is protected under the State Environmental Planning Policy (Resilience and Hazards) 2021 as a coastal wetland as well as other planning instruments and the Viva Plan of Management. The most apparent ecological positive associated with the Master Plan is the continued preservation of the wetland area inline with these policies. This wetland consists of numerous threatened communities, records of threatened species and provides suitable habitat for a suite of protected and threatened species. It is recommended that rehabilitation occurs within this area through the removal of priority weeds, with infill plantings using locally indigenous wetland species. The wetland area is also proposed to be rezoned as E2, from its current IN3. This will see greater protection for the wetland area, with restrictions placed on the types of works that can be done in the vicinity.

### 2.4.2 Foreshore

The foreshore utilisation proposed in the Master Plan for active transport, provides an opportunity for the current foreshore environment to be enhanced while providing a recreational area for the public. With strategic locally indigenous landscaping, as well as the maintenance and planned remediation of the certain areas of foreshore vegetation, this has the potential to increase the viability and connectivity of the habitat surrounding the Precinct.

It is recommended that the foreshores active transport, be constructed in a similar fashion to the pedestrian cycleway and walking tracks on the opposite side of Parramatta River. This example has utilised the outer 50% of the riparian corridor, to avoid impacts to mangroves and mudflats (**Photo Plate 1**), and recreational areas have been used as a buffer between the industrial business and foreshore environment. Any impacts to mangroves would need to be assessed at the development stage, with a fisheries permit produced and restoration plan likely to be needed.

### 2.4.3 Remediation and Greening Strategies

The proposed remediation strategy (Golders 2021) will aid in the management of the impacts of contamination across the Precinct, which will severely benefit the Precincts groundwater and the ecological communities that rely on them. The greening strategy (Kinesis 2021) as well as the finer grain street network of the master plan will see a increase in canopy cover across the Precinct, stating that it should account for at least 25% cover. This will provide valuable canopy connectivity across the Precinct and will increase the availability of foraging and nesting resources for the Precincts native birds and mammal species. It is acknowledged that owing to the contamination currently present across the Precinct, planting locations are likely to be restricted. Areas where remediation has been proposed as a possibility should be prioritised and filled out with vegetation as much as possible. It is recommended that the species utilised to increase canopy cover should be locally indigenous species with the aim to recreate the plant community that likely occurred in the location prior to development. Where possible local provenance seed should be used.



Photo Plate 1. Raised pedestrian cycleway and walking track on foreshore opposite the Precinct.

#### 2.4.4 Public Recreation and Open Space

The Precinct in its current state is lacking areas of public open space and public recreation. The Master Plan introduces new areas of open space and public recreation both close to the foreshore, as well as in the centre of the Precinct and along its western boundary. These open spaces provide opportunities for habitat enhancement through landscaping using locally indigenous species, which will provide additional habitat for native species.

Within these open space areas there is also the opportunity to enhance the habitat features of the Precinct further through the installation of nest boxes, which will provide habitat to avian, marsupial and microbat species. Hollows are an important feature of the ecology of any site, and one that is currently lacking within the Precinct. This could also provide an opportunity for education within the public recreation areas of Australia's native fauna.

## 2.5 Future Works

### 2.5.1 Threatened Species Targeted Surveys

Any proposed future works, particularly those relating to future active transport along the foreshore, in the vicinity of historically recorded threatened species should conduct the appropriate targeted surveys in line with state and federal government guidelines and survey periods. This is of particular importance for:

- *Litoria aurea* (Green and Golden Bell Frog);
- *Wilsonia backhousei* (Narrow-leaved Wilsonia); and
- *Acacia pubescens* (Downy Wattle).

These species are locally significant with suitable habitat currently still present within the Precinct. If these species are identified, they should be avoided where possible with management plans put in place to ensure their continued survival.

### 2.5.2 Green and Golden Bell Frog Habitat

While the most suitable habitat for Green and Golden Bell Frogs resides within the Wetland and Foreshore areas of the Precinct, the species is known to forage and shelter within grassland and exotic vegetation that borders these areas. Efforts should be made to retain these bordering areas as much as possible to avoid a reduction in overall habitat. Owing to the potential of vehicle strikes also, frog fencing should be explored around areas of grassland that border roads to minimise the potential of road mortalities.

#### 2.5.1 Foreshore and Wetland Edging

Foreshore riparian corridors and wetlands should have clear edges to contain adjoining land uses and minimise indirect impacts to the sensitive vegetation. The ideal outcome would be for any future works in the vicinity of these areas to need to incorporate a minimum set back, where the distance is between is managed by a Vegetation Management Plan. This would minimise edge effects, whilst also protecting and enhancing areas of sensitive vegetation across the Precinct.

#### 2.5.2 Mangrove Revegetation

Due to the proposed crossings of the Parramatta and Duck Rivers, it is likely that mangrove vegetation will be impacted to facilitate this construction. As removal of mangrove vegetation is likely to require removal to facilitate the Parramatta River and Duck River crossings, mitigation measures need to be considered to ensure significant impacts do not occur to the fragile ecosystem. Sections of the Parramatta River foreshore that were recorded as being historically cleared and absent of significant vegetation, these areas are prime places to conduct mangrove revegetation, which could be used to offset potential impacts associated with the crossings (**Figure 9**). In addition to these areas, 181 James Ruse Drive and 1 Grand Avenue, could be ideal locations for mangrove revegetation, once remediation works have been conducted. Mangrove revegetation can be conducted through either natural recruitment, planting with seeds or transplanting.



### 2.5.3 Wetland

#### 2.5.3.1 Expansion and buffer areas

The possibility of expanding the wetland area into the area surplus to Viva Energy Land should be considered. By expanding this wetland area, it would provide a substantial increase in the naturally occurring biodiversity features within the Precinct, whilst also providing a buffer zone, protecting the core of the wetland from the impacts of edge effects associated with the surrounding areas heavy industrial operations. Potential expansion areas are shown in **Figure 9**. These expansion areas are purely indicative of areas where could be achieved. It is acknowledged however that these areas cover existing businesses and might not be practical for the area.

Enabling public access to the wetland itself is likely to result in an increase in both direct and indirect impacts such as increased waste into the area, potential introduction of pathogens such as *Phytophthora cinnamomi*, accidental trampling of vegetation and habitat and increased run off into the wetland through the creation of footpaths and tracks. Buffer areas can be created to provide an educational space for the public, without impacting on the wetland itself.

#### 2.5.3.2 Wetland Specific Vegetation Management Plan

Viva Energy currently have a Plan of Management for Green and Golden Bell Frogs 2019, which details habitat creation and restoration actions currently being undertaken within the wetland site. It is recommended that if this land was taken over by Council or other state agency, then a site-specific Plan of Management should be prepared in keeping with the plan of management currently enacted by Viva energy to ensure the long-term survival of this important ecological area. A specific Vegetation Management Plan should be conducted detailing how this area will be protected and enhanced in perpetuity. The management plan should as a minimum include guidelines for weed removal, erosion control, revegetation works and habitat enhancement.

### 2.5.4 Streetscaping

In areas where biodiversity features are lacking, such as the Precinct, streetscaping can be a unique tool to provide canopy connectivity across a large area, where complete revegetation is not a viable option. It is highly recommended that the Master Plan utilises this technique using locally indigenous native species as they provide the greatest resources for native species and are naturally adapted to local conditions requiring less maintenance. The greening strategy proposed by Kinesis (2021) and the Landscape Implementation Report (Oculus 2022) aims at increasing green space and canopy coverages across the entire Precinct. It is recommended that greening and landscaping works should focus on areas that also provide habitat connectivity across the Precinct (**Figure 9**). It is acknowledged that the Precinct is highly constrained in area terms of contamination, therefore streetscaping should be emphasised in areas considered low-risk in terms of contamination (Golders 2021).

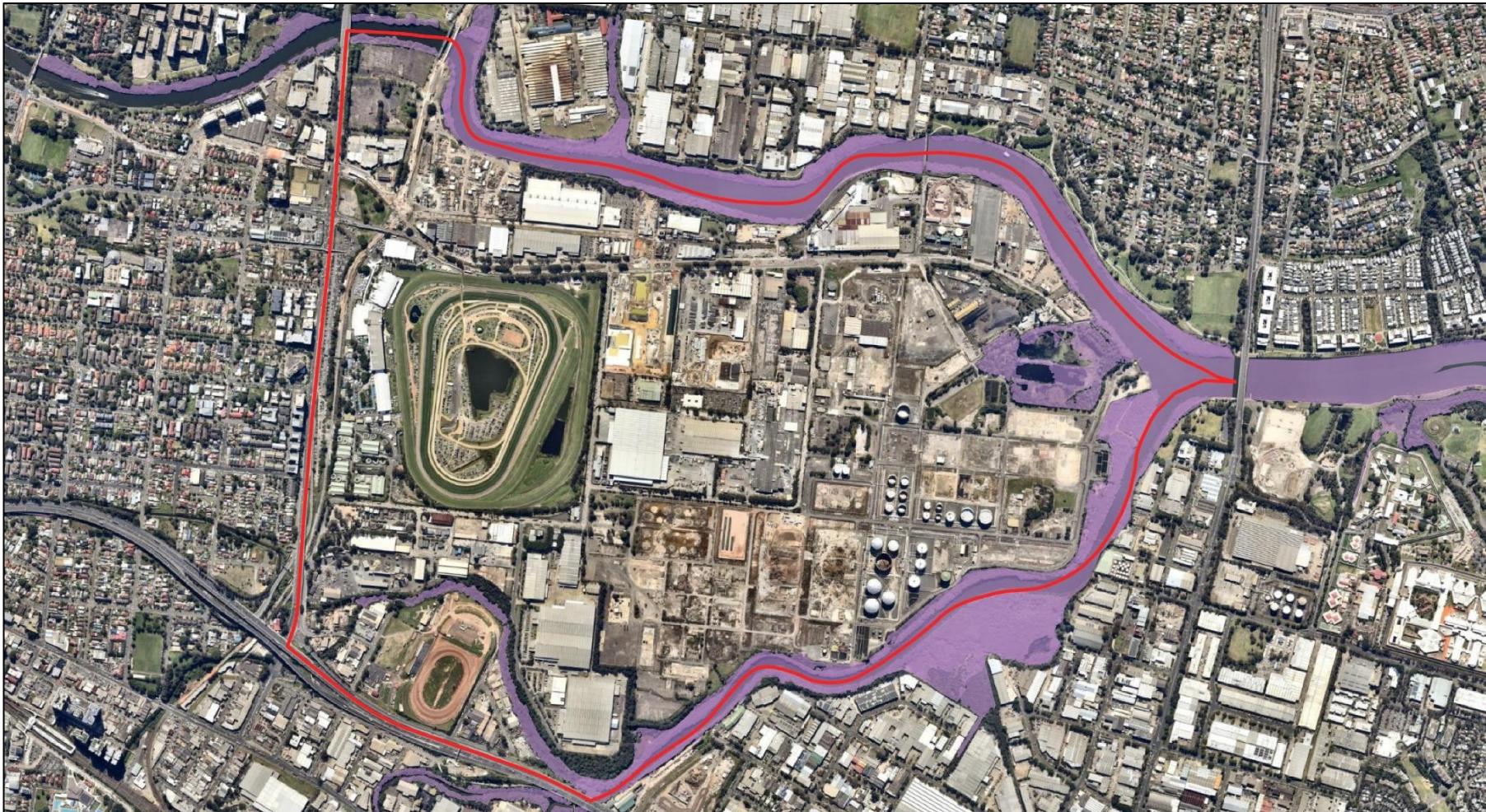
### 2.5.5 Potential Open Space Areas and Ecological Restoration

The land use map (**Figure 6**) associated with the Master Plan, lists two areas of potential further open and recreational space, within and surrounding the current Rosehill Racecourse. The area around the periphery of the racecourse should be prioritised as it provides the greatest potential to enhance ecological values within the Precinct and they have been identified as being low risk in terms of contamination (Golders 2021). If this area could be utilised it would also provide a large corridor through the centre of the Precinct which is currently lacking. This area already contains several native and urban species, and would be a cost-efficient location of habitat enhancement.

### 2.5.6 Future Development

The proposed foreshore remediation works and reestablishment of riparian corridors will also go a long way to improve valuable ecological values within the Precinct. All other future development within the Precinct should also aim to improve ecological values. This can most easily be achieved by the avoidance of removing native vegetation to facilitate works and through the incorporation of locally indigenous flora species into any associated landscape plans.

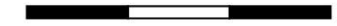




**Biodiversity Values Map**

- Subject Site
- Areas of Biodiversity Values (DPE 2022)

0 250 500 750 m



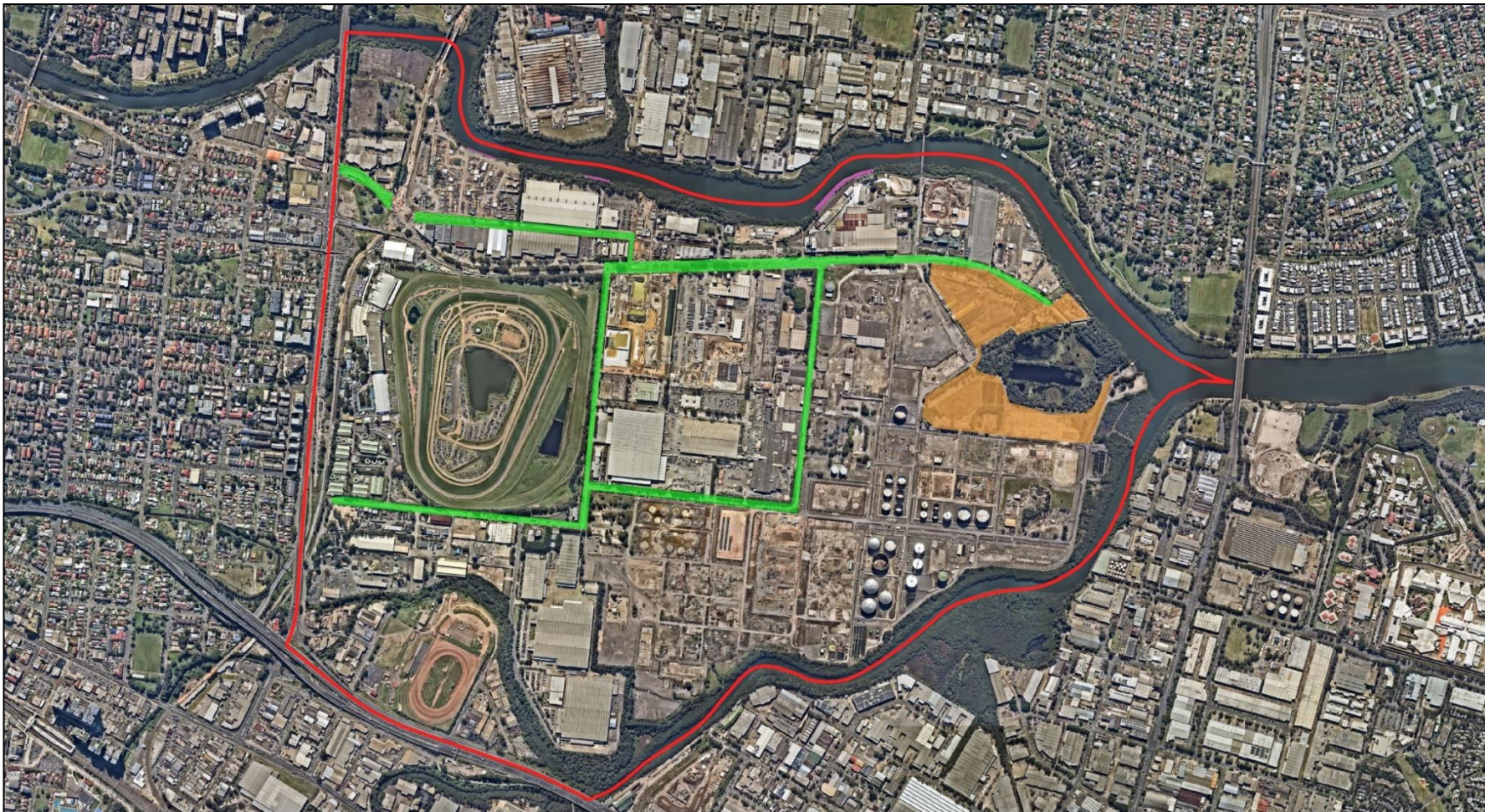
**NARLA**  
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Date: 02/05/2022  
 Coordinate System: GDA94 MGA Zone 56  
 Data Source: NSW SEED Portal; DPE 2022  
 Image Source: Nearmap Australia Pty Ltd [April 2021]



Figure 8. Areas of Biodiversity Values within the Precinct.

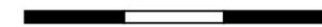




**Potential Future Works to Improve Biodiversity**

- ▬ Subject Site
- Potential Future Works**
- ▬ Mangrove Revegetation Areas
- ▬ Potential Wetland Expansion/Buffer Areas
- ▬ Potential Streetscaping Areas

0 250 500 750 m



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Date: 30/06/2021  
 Coordinate System: GDA94 MGA Zone 56  
 Data Source: NSW SEED Portal; SIX Maps 2021  
 Image Source: Nearmap Australia Pty Ltd [April 2021]



Figure 9. Potential areas for future ecological enhancement. Wetland expansion and Buffer areas are provided for consideration, however is acknowledged they would impact existing businesses and may not be practical..



## 2.6 Future Assessments and Approvals

Appropriate ecological impact assessment will be required for future DAs, especially where they are likely to involve the removal or indirect impacts to native vegetation. The specific ecological impact assessment will depend on whether the assessment are conducted during the planning phase (Biodiversity Certification) or later during the DA stage, depending on the assessment pathway under the *EP&A Act 1979*, undertaken by each future proposal.

### 2.6.1 Biodiversity Certification under Part 8 of the Biodiversity Conservation Act 2016

Biodiversity certification offers a streamlined biodiversity assessment process for areas of land that are proposed for development under part 8 of the BC Act. The process identifies areas that can be developed after they are certified and measures to offset the impacts of development. Where land is certified, development may proceed without the usual requirement for site-by-site assessment. It is particularly suitable when strategic land use planning at a landscape scale is proposed or underway (DPE 2021).

The Biodiversity Certifications process is broken down into the following six steps:

- Step 1: Plan and design the project before applying.
  - Planning and design involves identifying the assessment area to which the Biodiversity Certification will apply. This should be conducted in accordance with the local government agencies (Parramatta Council) as well as DPE. Areas proposed for biodiversity certification should be located to avoid and minimise impacts on native vegetation and threatened species. Areas containing Swamp Oak Floodplain Forest, Mangroves and wetland vegetation should not be certified.
- Step 2: Apply the Biodiversity Assessment Method (BAM) and prepare a Biodiversity Certification Assessment Report
  - A BAM accredited assessor will assess the biodiversity values within the proposed Biodiversity Certification Area. The accredited assessor will then assess the impacts of proposed development within the area proposed for certification and identify the biodiversity credits needed to offset the impacts. The BCAR will reflect the credit requirement generated by the BAM. The BCAR must identify the credits proposed to be retired to offset the impact.
- Step 3: Formal consultation with Council
  - This step only applies if an applicant is not a planning authority.
- Step 4: Submit the application to DPE and notify the public
  - After consultation with council, the applicant must invite the public to make submissions on the application. to the application after it has gone on public exhibition.
  - The applicant must provide a report to DPE that includes the applicant's response to any submissions from the public.
- Step 5: The Minister for the Environment considers and determines the application
  - When the application has been received and the council consultation and public notification processes have been completed, DPE reviews the application materials against the legislative requirements of the *BC Act 2017* and *Biodiversity Conservation Regulation (BC Reg) 2017*, and the technical requirements of the BAM. This includes a detailed review of the BCAR.
  - DPE then makes a recommendation to the Minister for the Environment on whether to confer biodiversity certification. The Minister must consult the Minister for Planning before determining the application. The Minister for the Environment has the final responsibility for the decision to confer biodiversity certification
- Step 6: Ongoing review and compliance checks
  - DPE, on behalf of the Minister, will undertake periodic reviews of conferred biodiversity certifications. It will also undertake compliance activities to ensure that parties to biodiversity certifications comply with the conservation measures required by the certification.

## 2.6.2 Development Applications Assessed Under Part 4 of the Environmental Planning and Assessment Act 1979

The requirements of the *BC Act 2016* and *BC Reg 2017* are mandatory for all future developments (DA) assessed pursuant to Part 4 of the *EP&A Act* submitted in the City of Parramatta Local Government Area, where there are potential impacts to native vegetation as well as flora and fauna.

The BC Act and its regulations stipulate clearing ‘area threshold’ values (**Table 5**) that determine whether a development is required to be assessed in accordance with the ‘Biodiversity Offset Scheme’ (BOS). Minimum entry thresholds for vegetation clearing depend on the minimum lot size (shown in the Lot Size Maps made under the LEP) or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP).

**Table 5. Biodiversity Offset Scheme Entry Thresholds.**

| Minimum lot size associated with the property | Threshold for clearing, above which the BAM and offsets scheme apply |
|---|--|
| Less than 1 ha                                | 0.25 ha or more  |
| 1 ha to less than 40 ha                       | 0.50 ha or more  |
| 40 ha to less than 1000 ha                    | 1 ha or more   |
| 1000 ha or more                               | 2 ha or more   |

Additionally, any future works conducted in mapped areas of ‘Biodiversity Value’ (**Figure 8**) that are prepared in accordance with Part 4 of the *EP&A Act* will in addition, under the BC Act, automatically require the preparation of a Biodiversity Development Assessment Report (BDAR) and entry into the BOS. If future developments remain underneath this threshold and avoid areas mapped as containing ‘Biodiversity Values’ then all that would be required is the production of a Flora and Fauna Assessment. It should be noted that the Biodiversity Values Map (**Figure 8**) is subject to ongoing review and change, prior to any development being conducted the mapping is to be reviewed to see if it applies to any proposed works.

## 2.6.3 Proposals Assessed Under Part 5 of the Environmental Planning and Assessment Act 1979

The requirements of the *BC Act 2016* and *BC Reg 2017* are mandatory for all activities assessed pursuant to Part 5 of the *EP&A Act*.

The test of significance (under s.7.3) determines whether the proposed activity is likely to significantly affect threatened species or ecological communities, or their habitats. If the activity is likely to have a significant impact, or will be carried out in a declared Area of Outstanding Biodiversity Value (AOBV), then a species impact statement (SIS) must be prepared, or a BDAR can be prepared if the proponent has opted into the BOS.

The environmental impact of activities that will not have a significant impact on threatened species will continue to be assessed under s.5.5 of the *EP&A Act 1979*. This is shown through the production of Review of Environmental Factors (REF).



### 3. Conclusion

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The Master Plan implementation through future development processes will result in a number of potential impacts on the ecology of the Precinct. In particular, impacts to the mangrove vegetation and shorebird habitat for the creation of the Parramatta River and Duck River crossings. Additional impacts associated include the potential removal of sections of Threatened Ecological Communities to accommodate certain future land uses.

The Master Plan does also achieve positive ecological outcomes through the continued protection of the wetland and riparian corridor and the enhancement of habitat features through the introduction of open spaces across the Precinct as well as the proposed remediation works and greening strategy.

Narla have also identified a number of opportunities to improve biodiversity further across the Precinct including:

- All river crossings should be strategically located as best as possible in already cleared areas or designed to minimise impacts on the foreshore environment;
- Creating a buffer area around the wetland area to minimise indirect impacts associated with surrounding land uses which may cause edge effects;
- If ownership of the wetland transfers to Council then a specific management plan should be prepared to ensure the ongoing survival and enhancement of the wetland area. This should be in line with the objectives of the current Plan of Management for the wetland (Biosphere 2014) and enhanced where needed;
- Mangrove revegetation should happen in areas along the foreshore that are not being utilised for river crossings. Areas that have been historically cleared or have been identified in the remediation plan should be prioritised;
- Locally indigenous street tree plantings should be utilised for the greening strategy along all roads in the Precinct to improve canopy cover connectivity;
- Future development should aim to avoid the removal of vegetation and should incorporate locally indigenous species into all landscape plans to improve the general ecology across the Precinct;
- Future development in the vicinity of wetlands and riparian corridors should incorporate a mandatory setback to managed under a vegetation management plan, to minimise edge effects and to protect and enhance the sensitive vegetation nearby; and
- Areas of greenspace should be created within the Precinct utilising locally indigenous flora species to provide increase foraging resources for native species.

If the recommendations suggested in this report are able to be implemented, then the Precinct would be able to achieve a significant positive outcome in terms of ecology.

## 4. References

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Biosis (2018) Viva Energy Clyde Western Area Remediation Project Appendix I Technical Report: Biodiversity Development Assessment Report.

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