Natural Area
CONSULTING MANAGEMENT SERVICES

Friends of Perry Lakes

Ecological Plan

Perry Lakes Reserve

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Acknowledgement of Country

Ngala kaaditj Noongar moort keyen kaadak nidja boodja.
Natural Area acknowledges the Traditional Owners of the lands on which we operate, and recognises their continuing connection to lands, waters and communities.

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Environmental management system registered to ISO 14001:2015
Quality management system registered to ISO 9001:2015
Occupational health and safety management system registered to ISO 45001:2018

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D1	April 2024	New Document	KE	LI/JW	Superseded
D2	July 2024	Inclusion of client comments	KE	JW/BC	Superseded
V1	August 2024	Inclusion of client comments	KE	BC	Released

Executive Summary

Natural Area Consulting Management Services (Natural Area) was contracted by the Friends of Perry Lakes to develop an ecological plan for Perry Lakes Reserve, Floreat. The Town of Cambridge recently completed a project to divert main drain water to Perry Lakes to enable water levels to be manipulated, with the intention to maintain water in the lakes year-round to support the range of fauna who inhabit the lake and surrounding areas. This ecological plan outlines the existing environmental values and provides recommendations for management according to best practice principles.

Natural Area has drawn upon 20 years of experience planning and implementing environmental and revegetation management plans across Western Australia, using on this on-ground collective experience to deliver an ecological plan that:

- is practical and adaptable to implement based on best and current industry practice,
- is scientifically accurate and ecologically appropriate, while capturing horticultural and agricultural knowledge to effectively establish functioning ecosystems
- provides the most significant positive environmental impact, while understanding the value of investment.

The outlined prescription in this document addresses the primary goals of the ecological plan, which were to:

- increase habitat connectivity, both within the site and to surrounding bushland areas, through vegetation establishment within degraded and completely degraded areas
- outline options to increase habitat values for the benefit and conservation of local native fauna
- provide recommendations relating to proposed infrastructure, to minimise impacts to native fauna and their habitat while providing amenity for users of the reserve.

Contents

1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was commissioned by the Friends of Perry Lakes Inc. (FoPL) to prepare an ecological plan for Perry Lakes Reserve.

The Town of Cambridge (the Town) has developed and is implementing the Perry Lakes Management Plan 2021-2031 which has a number of aims, one of which is to 'restore the wetlands and surrounds to create a biodiverse and self-sustaining wetland ecosystem and to provide a variety of fauna habitats'. The Town has recently completed a project to divert main drain water to Perry Lakes. This was conducted to enable water levels within the two wetlands to be manipulated as needed, with the intention of ensuring the area continues to support the range of fauna who inhabit the lake and surrounding areas.

The FoPL has been working in collaboration with a number of stakeholders, including the Town, state government departments, universities and other community groups including Birdlife WA.

1.1 Site Description

Perry Lakes Reserve is located approximately seven kilometres west of Perth CBD within the Town of Cambridge. The site encompasses two lakes covering approximately 12.6 ha and surrounding parkland (Figure 1). The reserve offers a range of passive recreational facilities including shaded picnic areas, paths, playgrounds, exercise facilities, barbeques, and public toilets. Alderbury Reserve sits to the north of Perry Lakes Reserve; it consists of a dog exercise area, skate park and recreational playing fields, used for cricket and hockey (Town of Cambridge (TOC), 2021b). Perry Lakes is part of Bush Forever Site 312 which encompasses Perry Lakes, Alderbury Reserve, and Bold Park (Department of Planning Lands and Heritage (DPLH), 2019).

1.2 Objectives

The main objectives of this plan are to:

- increase connectivity of habitat by establishing vegetation within degraded and completely degraded areas to surrounding bushlands
- outline options to increase habitat values for the benefit and conservation of local native fauna
- provide recommendations relating to proposed infrastructure to minimise their impacts to fauna and their habitat while providing amenity for users of the reserve.

This ecological plan will include:

- ecological assessments including:
    - desktop assessments of previous environmental surveys
    - reconnaissance flora survey
    - basic fauna survey
    - weed mapping
- stakeholder engagement from subject matter experts and key stakeholders including the FoPL and the Town
- habitat enhancement
    - revegetation plan

        - provide an indicative species list
        - provide planting densities for each revegetation zone
        - outline optimal locations for fringing vegetation and ecological linkages
    - weed management plan
        - weed prioritisation
        - proposed weed treatment techniques
    - outline ongoing monitoring program
        - water quality and water level monitoring
        - habitat enhancement monitoring
        - revegetation monitoring
- consider proposed infrastructure and recommendations to minimise impacts to environmental assets.

Floreat, Town of Cambridge

Figure 1:

Site Location
Perry Lakes Reserve

Legend

Site Boundary

Client:	Friends of Perry Lakes
Date:	12/06/2024
Created by:	S. Treloar
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4721

0 50 100 m

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2.0 Site Characteristics

The desktop survey included reviewing online databases to gather contextual knowledge and determine preliminary site characteristics including:

- likely native and non-native flora and fauna species present
- current extent of native vegetation
- general floristic community types.

The following databases and previous environmental surveys were accessed to obtain relevant information:

- Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water (DCCEEW)), 2024) (Appendix 1)
- FloraBase (WA Herbarium, 1998-)
- Perry Lakes Management Plan 2021-2032 (TOC, 2021a)
- Perry Lakes Master Plan 2021-2031 (TOC, 2021b)
- Perry Lakes Monitoring - Flora and Fauna Baseline Assessment (GHD, 2019)
- Perry Lakes Monitoring Report 2022/23 – Water Quality, Sediment and Macroinvertebrate Analysis (SLR, 2023)
- Aquatic Macroinvertebrate monitoring 2020 Perry Lakes, Perth, Western Australia (Invertebrate Solutions Pty Ltd, 2020)
- Perry Lakes Water Level Maintenance Project Feasibility Assessment (Rockwater, 2020).

Conservation code definitions for the State and Commonwealth are provided in Appendix 2.

2.1 Heritage

There are both indigenous and non-indigenous heritage values within the Perry Lakes Reserve boundary (Figure 2):

- The area defined as Perry Lakes has been identified by the Aboriginal Cultural Heritage Inquiry System as Heritage Place 3735, a former camp and hunting place (DPLH, 2024a).
- Perry Lakes is also registered with the State Heritage Council (No. 09008) and recognised for its historic value associated with prominent settlers Walter Padbury, Henry Trigg and Joseph Perry, who were significant figures in the early development of Western Australia (DPLH, 2024c).

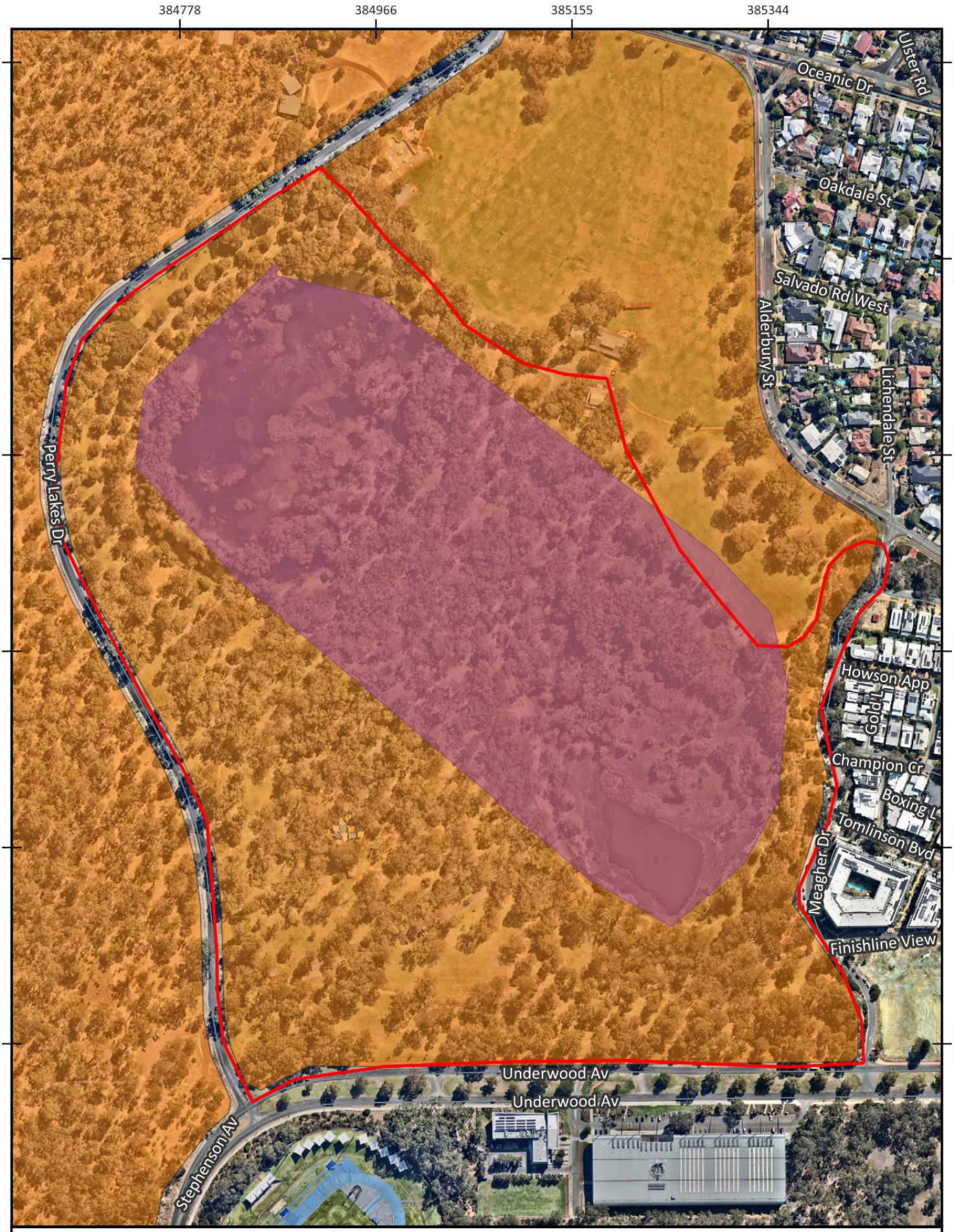

Figure 2:

Heritage Sites
Perry Lakes Reserve

Floreat, Town of Cambridge

Legend

- Site Boundary
- Aboriginal Culural Heritage
- State Heritage

Client:	Friends of Perry Lakes
Date:	26/07/2024
Created by:	J. Wei
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4721

0 50 100 m

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2.2 Current Infrastructure

Perry Lakes is currently a highly used recreational area that includes facilities such as a scout hall, sports pavilion, skate park, basketball court, various fitness equipment, toilet facilities, playground equipment, barbeques, picnic tables, bins and the Alderbury Sports ground which contains both hockey and cricket fields. Majority of the park land has reticulation installed and is regularly watered. Current infrastructure is depicted in Figure 3.

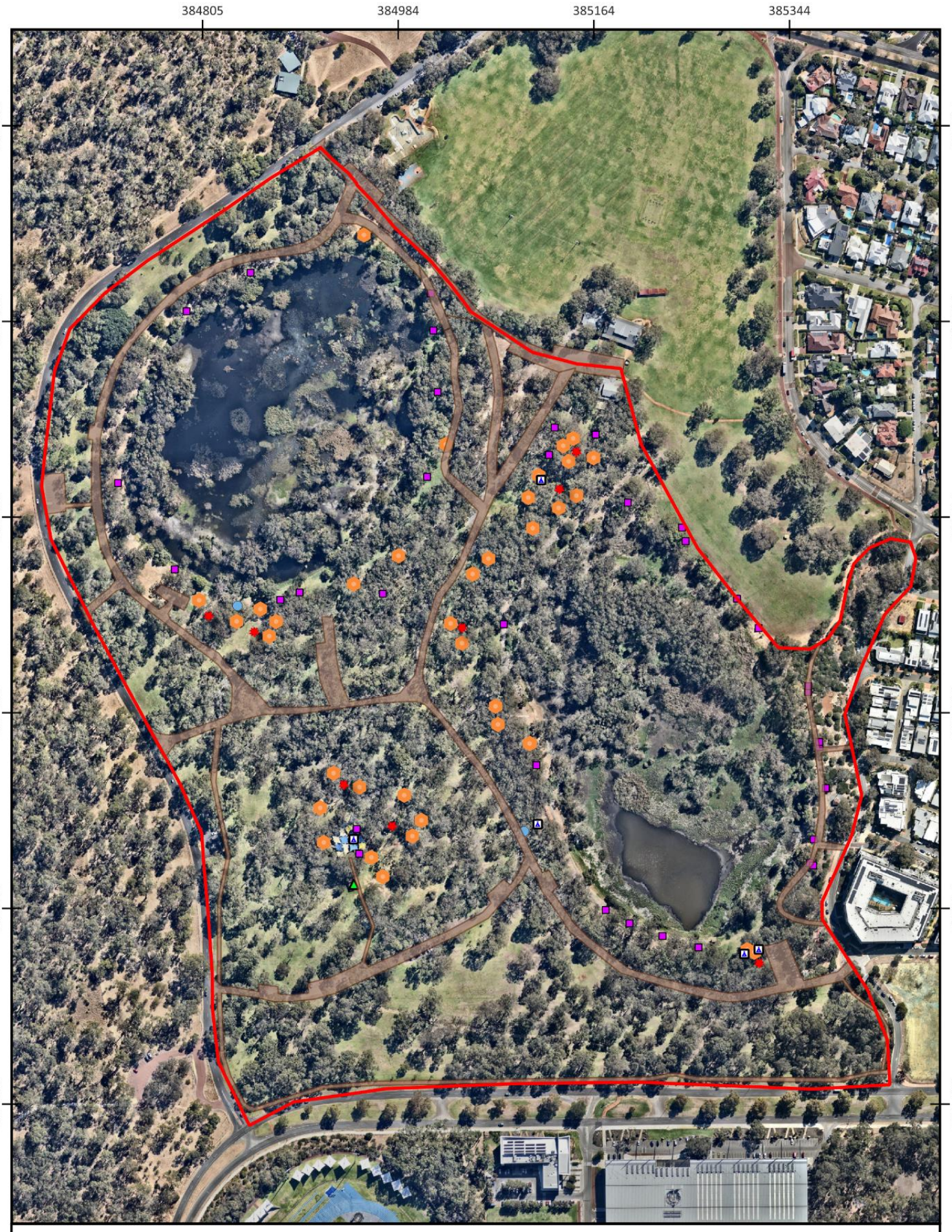

Figure 3:

Existing Infrastructure
Perry Lakes Reserve

Floreat, Town of Cambridge

Legend

Park Furniture
- BBQ
- Seat
- Shelter
- Table

- Toliet
- Water
- Existing Paths/Tracks
- Site Boundary

Client:	Friends of Perry Lakes
Date:	26/07/2024
Created by:	J. Wei
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4496

0 50 100 m

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2.3 Climate

The climate experienced in the area is Mediterranean, with dry hot summers and cool wet winters. According to the Bureau of Meteorology (BoM, 2024) Swanbourne (Station ID 009215), rainfall has been steadily decreasing over the past three years with the average rainfall per annum decreasing from 951.8 mm in 2021 to 618.6 mm in 2023, decreasing by 333.2 mm or 35 % (Figure 4). Maximum temperatures range from 19.5 °C in winter to 34.0 °C in summer, with a maximum recorded temperature of 44.3 °C. Minimum temperatures range from 7.6 °C in winter to 21 °C in summer, with a minimum recorded temperature of 2.4 °C (Figure 4).

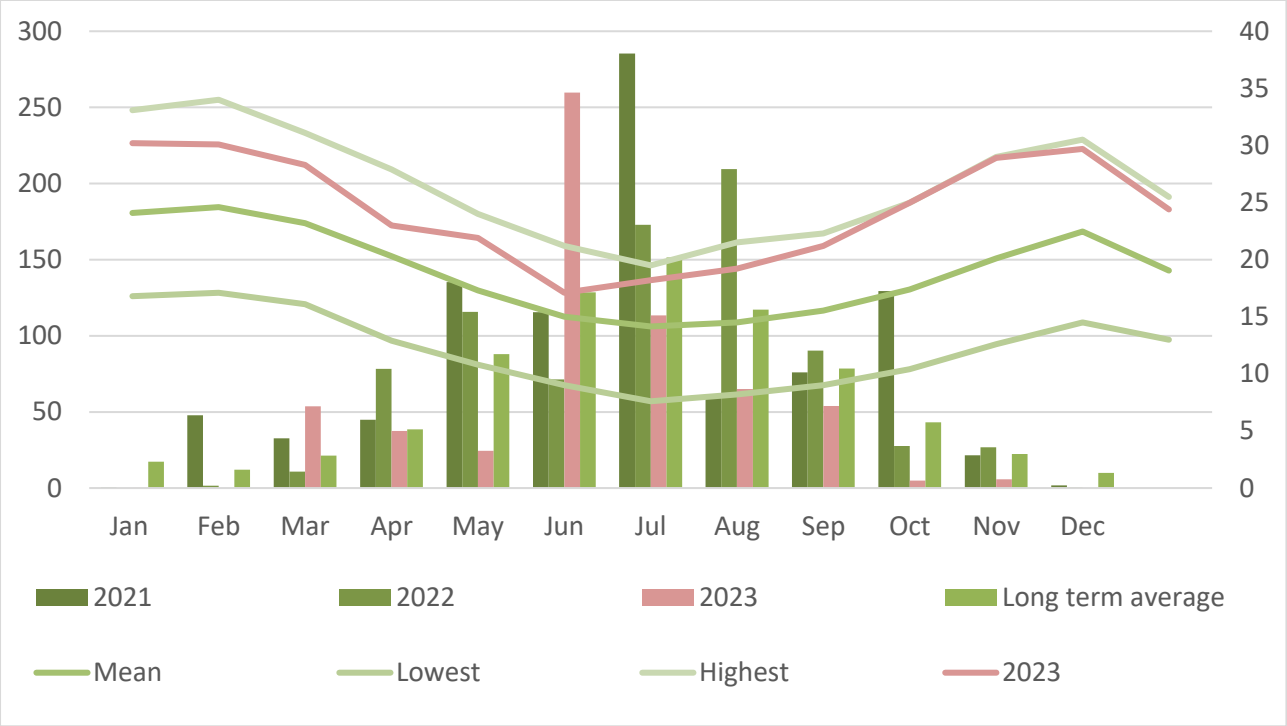

Figure 4: Annual rainfall (mm) from 2021 to 2023 and long-term average and average highest, lowest and mean temperature (°C) between 1994 and 2024 Swanbourne (Station Id 009215) (BoM, 2024).

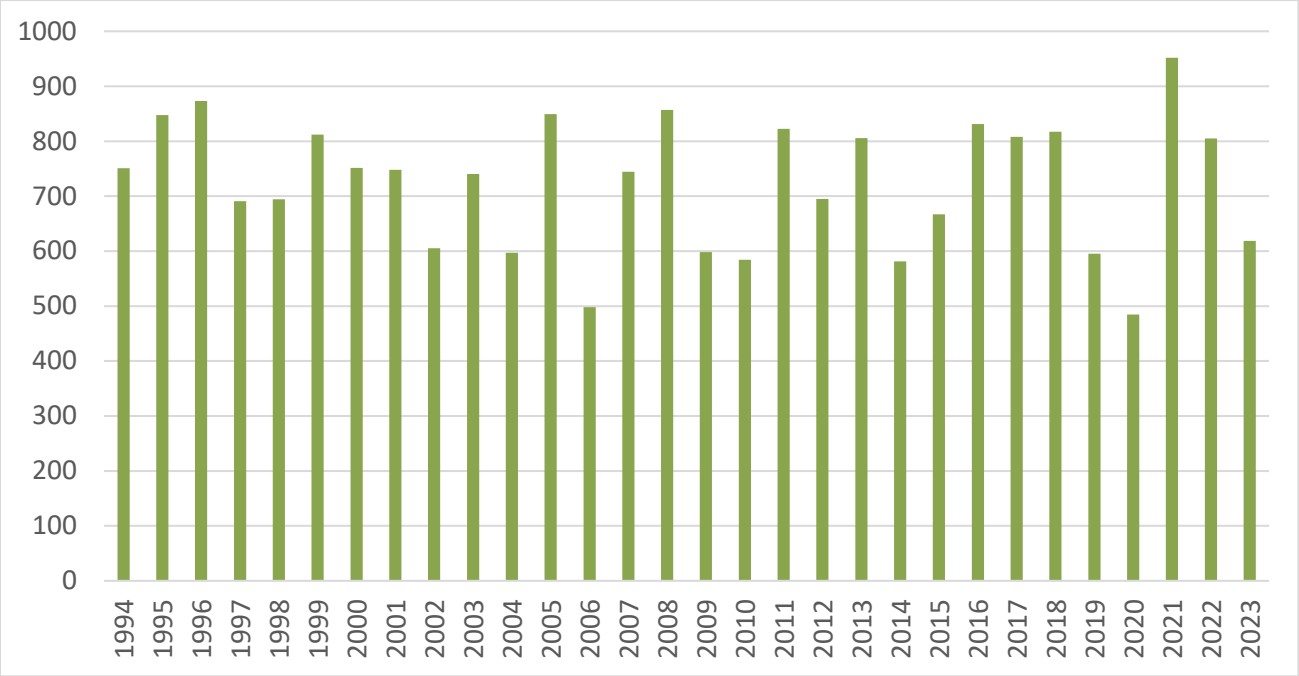

Figure 5: Long term average rainfall from 1994 and 2023 from Swanbourne WA (Station Id 009215) (BoM, 2024).

2.4 Topography and Soil

Perry Lakes Reserve forms part of the Spearwood System (211Sp_S7) which consists of pale and olive yellow, medium to course-grained, sub-angular to sub-rounded quartz trace of feldspar, moderately sorted of residual origin. The lacustrine area has high susceptibility of acidification, with the subsurface consisting of peaty clay -dark grey and black, soft variable organic content and quartz sand(211Sp_Cps) (Department of Primary Industries and Regional Development (DPIRD), 2022). The site ranges from 2 m Australian Height Datum (AHD) within the lakes and rises to 10 m AHD in the south (Figure 6) (DPIRD, 2019).

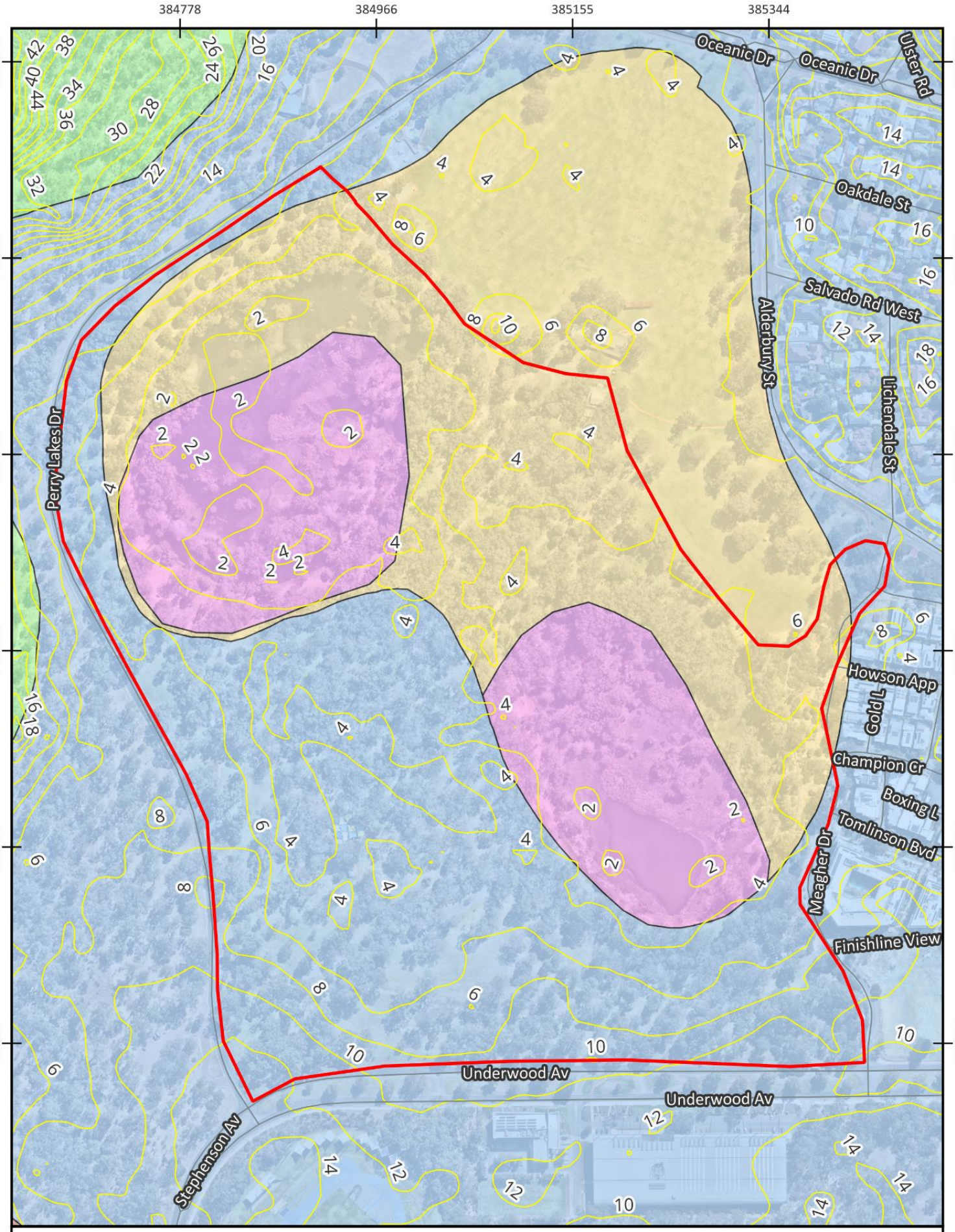

Figure 6:

Soil and Topology
Perry Lakes Reserve

Floreat, Town of Cambridge

Legend

Site Boundary
2m Contours

Soil Type
211Sp__Cps
211Sp__LS1
211Sp__S7
211SpW_LAKE

Client:	Friends of Perry Lakes
Date:	26/07/2024
Created by:	J. Wei
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4721

0 50 100 m

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2.5 Hydrology

Perry Lakes Reserve encompasses two large shallow, semi-permanent wetlands (East Lake and West Lake). The lake system is located on the southern boundary of the Gnangara Mound. Historically, water levels have seasonally fluctuated over a range of 2.0 to 5.0 m AHD (SLR, 2023). Permanent water has existed in East Lake since 1962 when dredging was conducted during the construction of the Perry Lake Stadium (Rich, 2004). The impact of drying climate has resulted in seasonal drying of West Lake, with permanent water in East Lake maintained between 2.87 and 2.9 m AHD (TOC, 2021a). East Lake's water levels have been supplemented through pumping bore water into the lake between November and April, however supplementation has ceased since the Herdsman Main Drain (HMD) diversion. West Lake is generally dry for half of the year from mid-November to May/June and has been heavily impacted by weeds, primarily Poaceae species (TOC, 2021a).

In February 2023 the Town completed the Perry Lakes Water Replenishment Program. This program has been designed to replenish and maintain permanent water levels within the system by redirecting freshwater overflow from nearby Herdsman Lake into Perry Lakes West Lake (SLR, 2023). The recent diversion of the stormwater from the Herdsman Main Drain has increased the water input into West Lake by up to 4.8 ML/day with an average of 2.9 ML/day since May 2023. The aim is to maintain an AHD of 3.8 m across both lakes throughout majority of the year. Water levels are expected to drop during low flow from the HMD in summer and autumn (TOC, 2021a); however, this will be dependent on water levels from the HMD and other diversions that may be implemented in the future. Water levels in May 2024 fell to 2.77 m AHD at east lake and 3.2 m AHD indicating that water levels are still fluctuating as per the natural seasonal variation. Water levels should be monitored regularly to determine what levels are expected to be based on water input and to determine the change in water regime over time.

A flow-through pipe has been installed connecting the two lakes to ensure water levels of East Lake are increasing in line with West Lake. At times of low water flow (summer and autumn), water levels may be lower than the pipe, thereby reducing inputs into East Lake. The flow-through pipe between the East Lake and West Lake will enable transfer of any nutrients and pests coming in from the HMD.

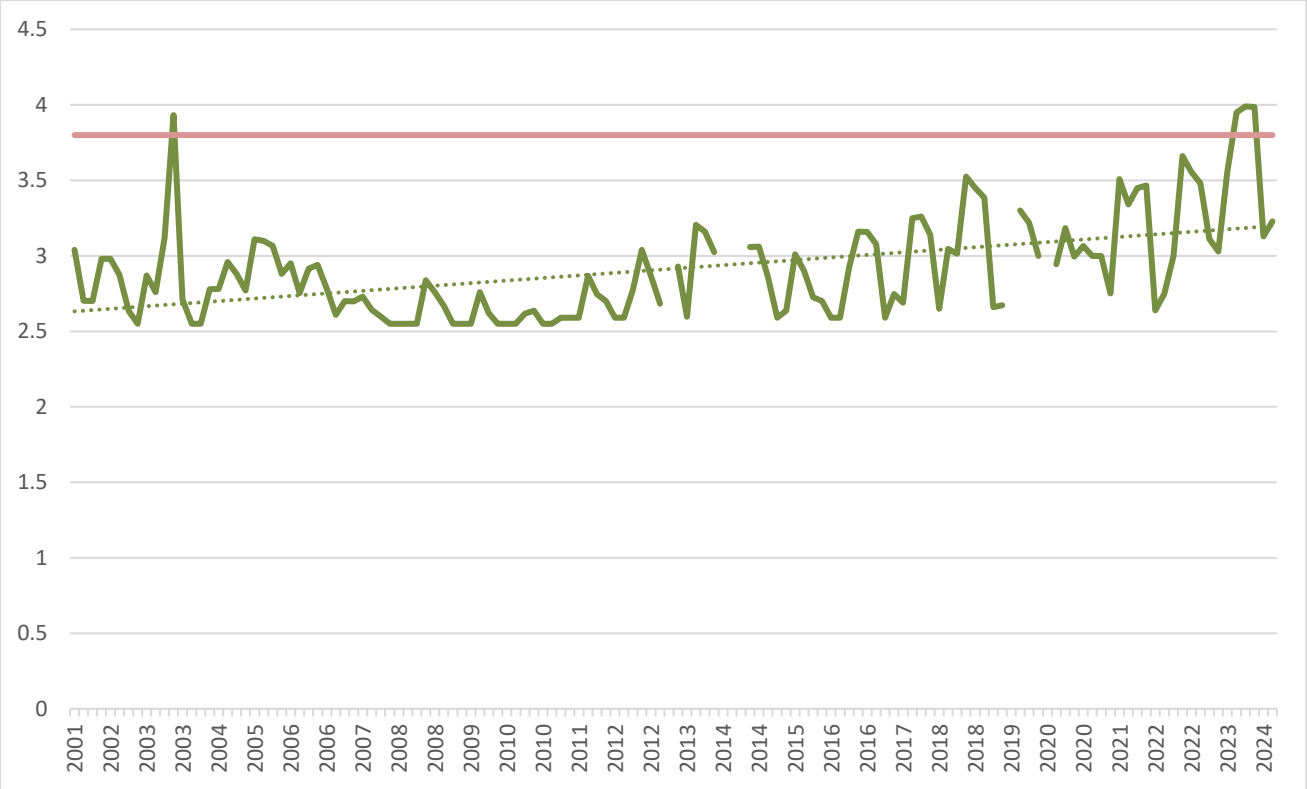

Figure 7: Water Levels from West Lake Staff Guage (6162503) (DWER, 2024).

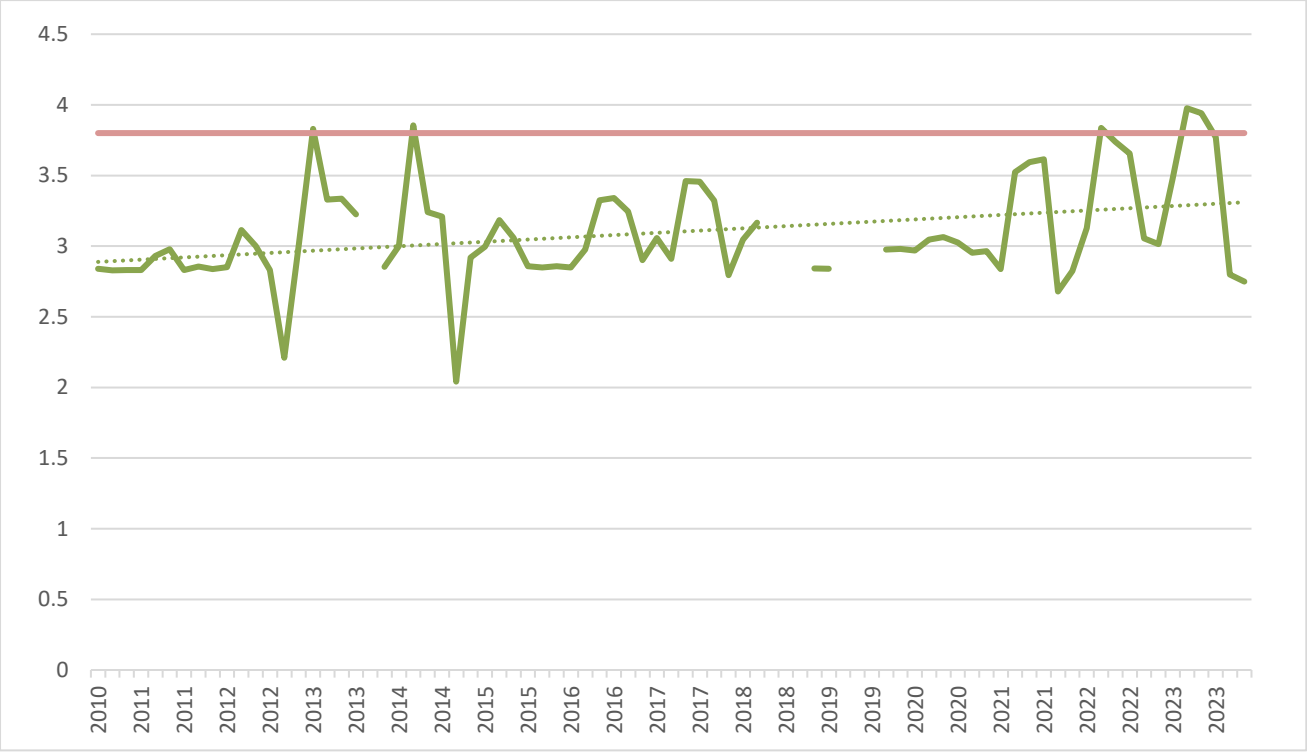

Figure 8: Water Levels from East Lake Staff Guage (6162626) (DWER, 2024).

30 January 2022 5 February 2024

Figure 9: Comparison of Perry Lakes pre and post Herdsman Main Drain (HMD) diversion.

2.6 Water Quality

Water quality monitoring is undertaken biannually and is typically undertaken in May or June following the first heavy rains and again in spring (TOC, personnel communication, May 22, 2024). Surface water quality is to be compared to the Australian and New Zealand Guidelines for fresh and marine water quality 2000 (ANZECC) 95 % trigger levels for toxicants in fresh water (TOC, 2021a) with recommendations of management actions to be given by the contractor undertaking water quality monitoring if trigger values are exceeded. Historical records of Phosphorus in the lakes show that the Phosphorus trigger level has exceeded 67 % of the time at West Lake and 50 % of the time at East Lake (TOC, 2023). Trigger level and most recent results are outlined in Table 1 with results in red indicating trigger levels being exceeded.

Table 1: 95 % Trigger levels (ANZECC and ARMCANZ, 2000) and Perry Lakes water quality results pre and post HMD Diversion (TOC, 2023)

Parameter	95 % Trigger Level (ANZECC)	June 2022				December 2022				June 2023				December 2023			
		East Lake		West Lake		East Lake		West Lake		East Lake		West Lake		East Lake		West Lake	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Phosphorus Total (mg/L)	0.06	0.17	0.042	0.11	0.008	0.092	0.053	0.15	0.092	0.091	0.046	0.058	0.063	0.065	0.034	0.085	0.035
Nitrogen Total (mg/L)	1.5	1.5	0.84	0.74	0.92	1.9	1.9	1.4	1.6	1	1.2	1.4	0.68	1.5	1.4	0.81	1.69
% Dissolved oxygen (%S)	Desirable range 90-120	23.3	69.4	9.5	5.5	31.5	22.3	56.7	61.7	38.2	21.5	80.3	51.9	40.6	40.9	31.2	58.9
pH	7-8.5	6.75	7.62	7.08	7.07	7.71	7.73	7.41	7.59	7.4	7.2	7.74	7.44	7.7	7.8	7.96	7.87
Turbidity (NTU)	0.1	1.6	1.4	11	220	13	2	10	3.5	1.6	3.2	5.2	4.5	6.7	2.1	5.3	1.3

Water quality samples should be taken to regularly to determine when the water quality is declining and to determine mitigation actions to eutrophication and the potential introduction of blue-green algae by keeping water temperatures low and managing accumulating nutrient levels within the lakes. The main inputs of nutrients to Perry Lakes include storm water runoff, groundwater flow through, inputs from bore water and direct run off from the immediate surroundings, including nutrients from domestic gardens such as fertilisers, compost, manures, animal faeces, leaf litter and other organic materials (TOC, 2021a).

It is critical that water quality monitoring is conducted regularly with the changing water regime to quickly determine a decline in water quality to avoid issues such as algal blooms. With the diversion of water from the HMD, it may prevent the drying of the lakes; however, it is expected that phosphorus levels within the lakes will increase as it will be unable to bind to the lakebed sediment during dry periods and convert from organic to inorganic nutrients (TOC, 2021a).

2.7 Flora

GHD conducted a baseline flora assessment in June 2019 (GHD, 2019); this was followed up in March 2024 by Natural Area with a basic flora survey. The flora and vegetation survey was conducted in accordance with *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority (EPA), 2016). Samples were collected, or photographs taken of unfamiliar flora species to enable later identification. Natural Area undertook the survey in March 2024, with key data recorded using Mappt software on a handheld tablet. Survey activities included:

- traversing the entirety of the site and recording all species present, including native and non-native (weed) species
- marking locations of any conservation significant flora, declared pests (DP) and/or Weeds of National Significance (WoNS) identified
- recording vegetation type including dominant upper, middle and lower storey species and condition using the scale attributed to Keighery (Government of Western Australia, 2000)
- the use of GPS to map significant species and boundaries of differing vegetation types and condition
- recording evidence of disturbance, such as fire.

2.7.1 Flora Survey Results

A total of 127 flora taxa representing 36 families and 93 genera have been recorded over the two surveys conducted by GHD (2019) and Natural Area. A combined species list of the GHD survey and Natural area survey is provided in Appendix 3 and a summary is provided in Table 2. No significant flora were identified during either survey. The flora diversity recorded was not representative of the natural floristic diversity of the local area. An increase of 27 native flora species was observed between the 2019 and 2024 flora surveys due to revegetation activities. Two recorded weed species, Bridal Creeper (*Asparagus asparagoides*) and Cotton Bush (*Gomphocarpus fruticosus*) are listed as a declared pest under the Biosecurity and Management Act 2007 (BAM Act). Although Bridal Creeper was not identified in 2024, it was not presenting at the time of the survey so may still be present on site.

Table 2: Summary of flora survey data (GHD, 2019)

	GHD 2019	Natural Area 2024
Flora taxa	66	115

	GHD 2019	Natural Area 2024
Family	29	36
Genera	47	81
Dubious Species	1	1
Introduced species	37	53

2.7.2 Vegetation Types

A total of eight vegetation types were identified by GHD (2019) across the two lakes and the area immediately surround the wetlands. The vegetation types are described in Table 3 and mapped in Appendix 4 (GHD, 2019). Vegetation types mapped by GHD are consistent with results collected by Natural Area in 2024 with only closed to open sedgeland and scattered trees over sedgeland/grass land being submerged.

Table 3: Vegetation types identified by GHD (2019) across East Lake and West Lake and surrounding areas at Perry Lakes Reserve.

Vegetation Type	Vegetation Type Description
Melaleuca Isolated Clump of Trees	Clumps of predominantly *Melaleuca* species, including *Melaleuca rhaphiophylla*, *M. incana*, **M. nesophila* and *M. cuticularis* occurring on the lakes banks and partially submerged along the edges. The cleared understorey is dominated by weed species **Cynodon dactylon*, **Oxalis pes-caprae* and **Hydrocotyle bonariensis.*
Open Parkland	The area surrounding the lakes is parkland cleared and consists of scattered trees dominated by locally native species *Eucalyptus rudis*, *E. gomphocephala*, *Agonis flexuosa* as well as introduced Eucalyptus, *Pinus* sp. and Melaleucas.
Closed to Open Sedgeland (submerged)	Closed to open sedgeland of *Schoenoplectus tabernaemontani* which forms dense stands up to 1.6 m. Other associated wetland species include *Cyperus polystachyos*, *Typha* sp., *Machaerina articulata*, *Bolboschoenus caldwellii* and *Juncus pallidus*. The sedgeland communities dominate the fringing open-water areas. **Cynodon dactylon* is encroaching into the wetland between the sedgelands and the lake margins.
Eucalyptus/Agonis Closed Forest	Closed forest of *Eucalyptus rudis*, *Agonis flexuosa* and *Casuarina obesa* over a predominantly bare understorey, with some patches of dead grass, **Hydrocotyle bonariensis*, scattered *Juncus pallidus* and **Cyperus congestus.*
Mixed Forest	Mixed Forest of native and introduced *Eucalyptus* (dominated by *E. rudis*) and *Melaleuca* species over scattered *Juncus pallidus* over an understorey dominated by introduced grasses (**Cynodon dactylon*, **Cenchrus clandestinus*, **Lagurus ovatus*). This vegetation type occurs on higher ground within the lakes margins.
Scattered Trees over Sedgeland/Grassland (Submerged)	Scattered mixed trees (predominantly *Eucalyptus rudis*) over open to scattered sedges of *Schoenoplectus tabernaemontani*, *Juncus pallidus*, *Typha* sp., **Cyperus congestus* over grassland of **Cynodon dactylon* and **Cenchrus clandestinus* over open herbland of **Oxalis per-caprae* and **Hydrocotyle bonariensis*.

Vegetation Type	Vegetation Type Description
Eucalyptus Woodland (submerged)	Woodland of mixed native and introduced *Eucalyptus* species (predominantly *E. rudis*) and *Melaleuca rhaphiophylla* over scattered sedges of **Cyperus congestus* and *Schoenoplectus tabernaemontani* over scattered aquatic plants. This woodland community occurs within the seasonally inundated margins between the water and the drier parkland areas.
Eucalyptus Open Forest	Open forest dominated by *Eucalyptus rudis*, *Agonis flexuosa* and *Melaleuca rhaphiophylla* over an understorey dominated by weedy grasses and herbs including **Cynodon dactylon*, **Cenchrus clandestinus*, **Hydrocotyle bonariensis*, and **Oxalis pes-caprae*. This vegetation type occurs on higher ground within the lakes margins in waterlogged soils and partially inundated areas.

2.7.3 Vegetation Condition

Vegetation condition was mapped by GHD (2019) across the two lakes and the area immediately surrounding the wetlands (Appendix 5 (GHD, 2019)). Previously majority of the lakes were mapped as degraded to completely degraded condition due to the presence and extent of weed species and lack of native understorey species (GHD, 2019).

Vegetation condition was reassessed by Natural Area in 2024 with areas to the northeast of West Lake increasing in vegetation condition from completely degraded to degraded through recent revegetation activities. Degraded areas within West Lake have further been reclassified as not assessed due to being inundated and classified as open water (Figure 10).

2.7.4 Threatened Ecological Communities

A review of the PMST report identified five threatened ecological communities (TECs) listed under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) within 10 km of the survey area:

- Banksia Woodlands of the Swan Coastal Plain ecological community (Endangered)
- Tuart (Eucalyptus gomphocephala) Woodlands and Forest of the Swan Coastal Plain ecological community (Critically Endangered).
- Empodisma peatland of southwestern Australia (Endangered)
- Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion (Critically Endangered)
- Subtropical and temperate coastal saltmarsh (Vulnerable).

Banksia Woodlands of the Swan Coastal Plain ecological community and Tuart Woodlands and Forest of the Swan Coastal Plain Ecological community are contained within Bold Park which is located adjacent to Perry Lakes Reserve. Based on the reconnaissance flora survey Tuart Woodlands of the Swan Coast Plain Ecological community is likely to be present within the site; however, has not been formally assessed.

Figure 10:

Vegetation Condition
Perry Lakes Reserve

Floreat, Town of Cambridge

Legend

- Degraded
- Completely Degraded
- Site Boundary

Client:	Friends of Perry Lakes
Date:	21/06/2024
Created by:	J. Wei
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4721

0 50 100 m

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2.8 Fauna

The basic fauna survey was completed in accordance with the *Technical Guidance, Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020). Natural Area traversed the site in March 2024 and undertook this survey in conjunction with other survey activities. A basic survey is defined as a low-intensity survey, which gathers broad fauna and habitat information including opportunistic fauna observations (EPA, 2020). The fauna survey included recording opportunistic sightings of fauna species while traversing the survey area, along with recording evidence of their presence in the form of:

- scats
- tracks
- diggings
- burrows, dens and warrens
- runnels (vegetative tunnels)
- calls.

2.8.1 Fauna Survey Results

The GHD basic fauna survey identified 43 fauna species within the survey area including 37 bird, 2 mammal, 3 amphibian and 1 reptile species. Of the species recorded, 6 were introduced. Natural Area recorded a further 4 bird species. A combined species list including fauna species recorded within the Towns *Perry Lakes Management Plan 2021-2031* (TOC, 2021a), a Bat Survey conducted by the FoPL (FoPL, 2024) and Bird Life data (Birdata) (Birdlife, 2024) is outlined in Table 4 below. The combined fauna surveys have identified 109 fauna species within the survey area including 87 bird, 10 mammal, 6 amphibian and 6 reptile species.

A summary of key species identified within the survey area, their habitat requirements and potential habitat enhancements are outlined in Section 5.

Table 4: Combined fauna species list from the GHD (2019) survey, Natural Area 2024 survey, Birdlife Data (Birdata,2024) and Town of Cambridge (TOC, 2021a)

Family	Species	Common Name	Prescence Y/N			
			2019	2021	2024	Birdata
Amphibian						
Limnodynastidae	*Heleiporus eyrie*	Moaning Frog	N	Y	N	N/A
Limnodynastidae	*Limnodynastes dorsalis*	Western Banjo Frog	Y	Y	N	N/A
Myobatrachidae	*Crinia insignifera*	Squelching froglet	Y	Y	N	N/A
Myobatrachidae	*Myobatrachus gouldi*	Turtle Frog	N	Y	N	N/A
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog	Y	Y	N	N/A
Pelodryadidae	*Litoria moorei*	Motorbike Frog	N	Y	N	N/A
Bird						
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	Y	Y	N	Y
Acanthizidae	*Chalcites lucidus*	Shining Bronze Cuckoo	N	N	N	Y
Acanthizidae	*Gerygon fasca*	Western Gerygone	Y	Y	N	Y
Acanthizidae	*Pachycephala rufiventris*	Rufous Whistler	N	N	N	Y
Acanthizidae	*Petroica boodang*	Scarlet Robin	N	N	N	Y
Acanthizidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater	Y	Y	N	Y
Acanthizidae	*Platalea flavipes*	Yellow-billed Spoonbill	N	Y	Y	Y
Acanthizidae	*Plegadis falcinellus*	Glossy Ibis	N	Y	N	Y
Acanthizidae	*Smicrornis brevirostris*	Weebill	Y	Y	N	Y
Acanthizidae	*Todiramphus sanctus*	Sacred Kingfisher	N	N	N	Y

Family	Species	Common Name	Prescence Y/N			
			2019	2021	2024	Birdata
Accipitridae	*Aythya australis*	Hardhead	N	N	N	Y
Accipitridae	*Chalcites basalis*	Horsfields Bronze Cuckoo	N	N	N	Y
Accipitridae	*Circus approximans*	Swamp Harrier	Y	Y	N	Y
Accipitridae	*Lichenostomus virescens*	Singing Honeyeater	Y	Y	N	Y
Accipitridae	*Lichmera indistincta*	Brown Honeyeater	Y	Y	N	Y
Accipitridae	*Poliocephalus poliocephalus*	Hoary-headed Grebe	N	N	N	Y
Acrocephalidae	*Acrocephalis australis*	Australian Reed Warbler	Y	Y	N	Y
Alcedinidae	*Dacelo novaequineae*	Laughing Kookaburra	Y	Y	Y	Y
Anatidae	*Acanthorhynchus superciliosus*	Western Spinebill	N	Y	N	N
Anatidae	*Anas gracilis*	Grey Teal	Y	Y	Y	Y
Anatidae	*Anas superciliosa*	Pacific Black Duck	Y	Y	Y	Y
Anatidae	*Ardea alba*	Great Egret	N	N	Y	Y
Anatidae	*Ardea modesta*	Great Egret	Y	Y	N	N
Anatidae	*Ardea novaehollandiae*	White-faced Heron	Y	Y	N	Y
Anatidae	*Biziura lobata*	Musk Duck	N	Y	N	Y
Anatidae	*Cygnus atratus*	Black Swan	Y	Y	Y	Y
Anatidae	*Oxyura australia*	Blue-billed Duck	N	Y	N	Y
Anatidae	*Tadorna tadornoides*	Australian Shelduck	Y	N	Y	Y
Ardeidae	*Hirundo neoxena*	Welcome Swallow	N	Y	N	Y

Family	Species	Common Name	Prescence Y/N			
			2019	2021	2024	Birdata
Ardeidae	*Nycticorax caledonicus*	Nankeen Night-heron	N	Y	N	Y
Artamidae	*Cracticus tiibicendorsalis*	Australian Magpie	Y	Y	Y	Y
Artamidae	*Cracticus torquatus*	Grey Butcherbird	Y	Y	Y	Y
Artamidae	*Pardalotus punctatus*	Spotted Pardelote	N	N	N	Y
Artamidae	*Poodytes gramineus*	Little Grassbird	N	Y	N	Y
Artamidae	*Porphyrio melanotus*	Purple Swamphen	Y	Y	Y	Y
Cacatuidae	*Anas platyrhynchos*	Mallard	N	N	N	Y
Cacatuidae	*Grallina cyanoleuca*	Magpie-lark	Y	Y	N	Y
Cacatuidae	*Microcarbo melanoleucos*	Little Pied Cormorant	N	N	N	Y
Cacatuidae	*Cacatua sanguinea*	Little Corella	N	Y	Y	Y
Cacatuidae	*Eolophus roseicapilla*	Galah	Y	Y	Y	Y
Campephagidae	*Pardalotus striatus*	Striated Pardelote	N	N	N	Y
Campephagidae	*Spilopelia chinensis*	Spotted Dove	N	N	N	Y
Columbidae	*Phaps chalcoptera*	Common Bronzewing	N	Y	N	Y
Columbidae	*Streptppelia senegalensis*	Laughing Dove	Y	Y	N	Y
Dasyornithidae	*Phalacrocorax sulcirostris*	Little Black Cormorant	Y	Y	Y	Y
Diomedeidae	*Zanda latirostris*	Carnaby's Black Cockatoo	N	N	N	Y
Falconidae	*Hieraaetus morphnoides*	Little Eagle	N	N	N	Y
Fregatidae	*Fulica atra*	Eurasian Coot	Y	Y	Y	Y

Family	Species	Common Name	Prescence Y/N			
			2019	2021	2024	Birdata
Glareolidae	*Barnadius zonarius*	Australian Ringneck	Y	Y	N	Y
Glareolidae	*Chenonetta jubata*	Australian Wood Duck	N	N	N	Y
Hirundinidae	*Ardea pacifica*	White-necked Heron	N	N	N	Y
Laniidae	*Daphoenositta chrysoptera*	Varied Sitella	N	N	N	Y
Laridae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	N	N	N	Y
Laridae	*Elanus axillaris*	Black-shouldered Kite	N	N	N	Y
Laridae	*Tribonyx ventralis*	Black-tailed Native Hen	N	N	N	Y
Laridae	*Zapornia pusilla*	Baillons Crake	N	N	N	Y
Locustellidae	*Tachybaptus novaehollandiae*	Australasian Grebe	N	Y	N	Y
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	Y	Y	Y	Y
Meliphagidae	*Anthochaera lunulata*	Western Little Wattlebird	Y	Y	N	N
Meliphagidae	*Calyptorhynchus banksii*	Red-tailed Black Cockatoo	N	N	N	Y
Meliphagidae	*Himantopus leucocephalus*	Pied Stilt	N	Y	Y	Y
Meliphagidae	*Malacorhynchus membranaceus*	Pink-eared Duck	N	N	N	Y
Meliphagidae	*Merops ornatus*	Rainbow bee-eater	N	N	N	Y
Meliphagidae	*Petrochelidon nigricans*	Tree Martin	N	Y	N	Y
Monarchidae	*Acanthiza inornata*	Western Thornbill	N	N	N	Y
Motacillidae	*Zapornia tabuensis*	Spotless Crake	N	Y	N	Y
Motacillidae	*Zosterops lateralis*	Silvereye	Y	Y	N	Y

Family	Species	Common Name	Prescence Y/N			
			2019	2021	2024	Birdata
Muscicapidae	*Trichoglossus haematodus*	Rainbow Lorrikeet	Y	Y	Y	Y
Petroicidae	*Phylidonyris niger*	White-cheeked Honeyeater	N	N	N	Y
Procellariidae	*Accipiter cirrocephalus*	Collared Sparrowhawk	N	N	N	Y
Procellariidae	*Columba livia*	Domestic Pigeon (Rock Dove)	Y	Y	N	Y
Procellariidae	*Gallinula tenebrosa*	Dusky Moorhen	Y	Y	Y	Y
Rallidae	*Hypotaenidia philippensis*	Buff-banded Rail	N	Y	N	Y
Rhipiduridae	*Cacatua pastinator*	Western Long-billed Corella	N	N	N	Y
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	Y	Y	N	Y
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	Y	Y	Y	Y
Scolopacidae	*Anhinga novaehollandiae*	Australasian Darter	N	N	N	Y
Scolopacidae	*Chroicocephalus novaehollandiae*	Silver Gull	N	Y	N	Y
Scolopacidae	*Corvus coronoides perplexus*	Australian Raven	Y	Y	Y	Y
Scolopacidae	*Falco longipennis*	Australian Hobby	Y	Y	N	Y
Scolopacidae	*Pelecanus conspicillatus*	Australian Pelican	N	N	N	Y
Scolopacidae	*Porzana fluminea*	Australian Spotted Crake	N	N	N	Y
Scolopacidae	*Spatula rhynchotis*	Australasian Shoveler	N	N	N	Y
Spheniscidae	*Accipiter fasciatus*	Brown Goshawk	N	N	N	Y
Turdidae	*Threskiornis moluccanus*	Australian White Ibis	Y	Y	Y	Y
Turdidae	*Threskiornis spinicollis*	Straw-necked Ibis	N	Y	N	Y

Family	Species	Common Name	Prescence Y/N			
			2019	2021	2024	Birdata
Upupidae	*Malurus splendens*	Splended Fairywren	Y	Y	N	N
Mammal						
Canidae	*Canis domesticus*	Domestic Dog	Y	Y	Y	N/A
Canidae	*Vulpes vulpes*	European Red Fox	N	Y	N	N/A
Felidae	*Felis catus*	Cat	Y	Y	N	N/A
Molissidae	*Austronomus australis*	White-striped Freetail Bat	N	Y	Y*	N/A
Molissidae	*Ozimops kitcheneri*	Western Free-tailed Bat	N	N	Y*	N/A
Pseudocheiridae	*Pseudocherius occidentalis*	Western Ringtail Possum	N	Y	N	N/A
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat	N	N	Y*	N/A
Vespertilionidae	*Falsistrellus mackenziei*	Western Falsistrelle	N	N	Y*	N/A
Vespertilionidae	*Nyctophilus geoffroyi geoffroyi*	Lesser Long-eared Bat	N	N	Y*	N/A
Vespertilionidae	*Vespadelus regulus*	Southern Forest Bat	N	N	Y*	N/A
Reptile						
Cheluidae	*Chelodina oblonga*	Oblong turtle	Y	Y	N	N/A
Gekkonidae	*Christinus marmoratus*	Marbled Gecko	N	Y	N	N/A
Scincidae	*Tiliqua rugosa*		N	Y	N	N/A
Scincidae	*Cryptoblepharus buchanaii*		N	Y	N	N/A
Scincidae	*Hemiergis quadrilineatus*		N	Y	N	N/A
Scincidae	*Menetia greyii*		N	Y	N	N/A

Note: * represents data collected as part of a bat survey conducted in February 2024 by FoPL and Norm McKenzie (FoPL, 2024).

2.8.2 Fauna Habitat

The survey area contains several habitat types including open water, seasonally inundated areas, sedgelands, grassy banks, mixed woodlands and open parkland with remnant trees. Two broad fauna habitat types were identified and are described in Table 5 below.

Table 5: Fauna Habitat Types within Perry Lakes (GHD, 2019)

Habitat Type	Description	Associated Vegetation Type
Wetland	Wetland habitat includes open water, sedgelands, invasive grasslands and seasonally inundated areas (including scattered trees and inundated woodlands). The open freshwater areas and fringing vegetation provide important habitat and food resources for fauna.	▪ Closed to open sedgeland ▪ Scattered trees over grassland/sedgeland ▪ Open Water ▪ Inundated Eucalyptus woodland
Woodland or Forest	The woodland and forest habitat combines all other vegetation types present within the site. These areas consist of open to closed tree canopy over grassland or parkland with the occasional sedgeland lower understorey. Established tree canopy and clumps of *Melaleuca* species provide shelter and food resources. Some remnant trees provide suitable hollows for birds. Revegetation activities surrounding each lake have increased the middle storey since the 2019 survey providing additional shelter and food resources for a number of bird species.	▪ Melaleuca isolated clumps of trees ▪ Open parkland ▪ Eucalyptus closed forest ▪ Mixed forest ▪ Eucalyptus open woodland

3.0 Survey Limitations

Limitations associated with the flora and fauna assessments have been outlined in Table 6.

Table 6: Flora and fauna survey limitations

Potential Limitation	Degree of Limitation	Comments
Access	Minor	Large portions of the lakes were inaccessible due to being inundated with water at the time of both surveys being conducted. The survey effort is sufficient for the basic fauna and reconnaissance flora surveys conducted.
Availability of contextual information	None	Regional and local contextual information was readily available for the site.
Competency/experience of team	None	Survey activities were undertaken by experienced ecologists who have extensive experience undertaking detailed flora surveys and fauna surveys within this bioregion (Swan Coastal Plain).
Proportion of flora recorded/collected, any identification issues	None	A reconnaissance flora and basic fauna survey was undertaken to give a broad understanding of the site characteristics. A total of 115 flora species (taxa) were recorded from 36 families during the field survey, comprised of 53 introduced (weeds) and 61 native species.
Survey timing	Minor	Surveys were conducted in June 2019 and March 2024. These are not considered to be within the optimal survey time to complete flora surveys within the Swan Coastal Plain bioregion. It is likely that annual species (native and exotics) may not be presenting and have not been recorded.
Disturbances	None	No recent disturbances which may have had an impact on survey results (e.g. fire, recent clearing or floods) were identified during the survey.

4.0 Stakeholder Engagement

Workshops were conducted on 17 April and 2 May 2024 to gather inputs from allied experts and key stakeholders. The stakeholder engagement contributed to the understanding of unique challenges and opportunities within the reserve, as well as informing management actions and recommendations for the Perry Lakes Reserve Ecological Plan. Stakeholders include, but are not limited to:

- Birdlife WA
- Friend of Bold Park
- Friends of Perry Lakes
- Naturelink Perth
- Saving Our Snake-Necked Turtle
- Town of Cambridge
- University of Western Australia.

Key themes of the workshops included:

- revegetation species, densities and locations
- water regime
- potential habitat enhancements for fauna species
- weed and pest management.

Table 7: Key discussion items and outcomes

Key theme	Discussion item	Discussion outcome
Revegetation	Suitable native species list for different revegetation zones	Rough species list discussed in depth with additional species including aquatic plants discussed and concerns over potential host species of the of the Polyphagous Shot-hole Borer considered.
	Plant installation densities	Plants to be installed at a minimum of 6 tubestock per m^2 in wetland areas and 3-4 plants per m^2 in dryland areas. Ideally the more the better. Poaceae and Cyperaceous species to be installed at higher densities in in dryland area.
	Revegetation locations and key linkage locations	Suitability of each flora species and best location for species to be installed was outlined. Best location for linkage between West Lake and Bold Park outlined based on citizen science and public observations of frog migrations between the two reserves (middle west of West Lake to the north of Tuart Car Park). Linkage between East Lake and West Lake to be integrated amongst infrastructure at the smallest distance between the lakes and expanded as much as possible.

Key theme	Discussion item	Discussion outcome
Water regime	Water levels	Water level fluctuations and stability is currently unknown as HMD diversion has only been in operation for one year. It has been acknowledged that the pumps can be turned off and on to manage water levels to suit fauna within Perry Lakes Reserve. In the first year of operation water levels continued to seasonally fluctuate and are expected to in the future however will likely be dependent on the years rainfall and other requirements from the HMD. Ideally water levels are to be monitored regularly to track the fluctuation in water levels in conjunction with the input of water. Once a baseline water level has been established it can be better determined the best artificial water level management program through the operation of pumps. It is expected that the most suitable regime will mimic seasonal variation to meet the basic needs of fauna within the reserve whilst still meeting the requirements of migratory bird species.
	Water quality	Water quality is expected to decline if the lakes do not dry out in summer allowing phosphorus to build in the water column. Ongoing monitoring to be undertaken to monitor any change in water quality and determine mitigation actions to be implemented. The Friends of Perry Lakes has calculated that an additional 100 kg of phosphorus per annum will be added into West Lake from the HMD (Don McFarlane, personnel communication, April 17, 2024).
	How water regime will affect habitat	Majority of fauna should be able to adapt to the increase of water levels within the lakes; however, the main concern is over the Moaning Frog (*Heleioporus eyrie)* as it requires seasonal fluctuation of water levels for breeding habitat. As water levels have not stabilised and may not stabilise, the water levels and presence of the Moaning Frog should be monitored during the first years of the HMD diversion to understand the impacts of changing water levels. Via the monitoring of water levels and the health of the Moaning Frog population recommendations can be made on the artificial management of water levels through the operation of pumps.
	Balance Pipe Between East Lake and West Lake	The balance pipe between the two lakes was proposed to be blocked. The water diverted from the HMD into West Lake is likely to contain: ▪ carp eggs ▪ pearl cichlid live and eggs ▪ at least 100 kg phosphorus per annum ▪ an unknown amount of nitrogen per annum

Key theme	Discussion item	Discussion outcome
		The introduction of carp and pearl cichlids will likely increase the turbidity and mobilise sored nutrients increasing the likelihood of eutrophication. Feral fish will also compete with native fauna for insects and algae food.
Potential habitat enhancements	Target fauna species	Four main fauna groups (bird species, frog species, Oblong Turtles (*Chelodina oblonga)*, and Quenda *(Isoodon fusciventer*)) were identified as targets for habitat enhancement within the reserve.
	Revegetation	Habitat enhancement through revegetation was determined to be the most beneficial for all target species through the installation of various plant pallets as outlined in Section 5.4.4.
	Artificial habitat enhancements	Artificial habitat enhancements feasibility and potential benefits and disadvantages were outlined (Section 5.6).
Weed and pest management	Weed control	Large quantity of weed control is carried out by the FoPL and contractors. Structure around timing and treatment options of weed management discussed in Section 5.5.
	Typha Management	Typha is currently providing habitat for target fauna species. Reduction of nutrients via the removal of *Typha* sp. was discussed as a potential mitigation of water quality issues as is discussed in Section 5.8

5.0 Enhancing Habitat Values

The aim of this Ecological Plan is to increase the habitat values of Perry Lakes Reserve for the benefit and conservation of local native fauna. This will be achieved through the implementation of a revegetation program with a focus on creating ecological linkages to improve habitat values at the Perry Lakes Reserve.

The following section outlines revegetation recommendations including:

- species selection
- revegetation zones and ecological linkage locations
- installation densities
- revegetation methodology.

5.1 Ecological Linkages

Ecological linkages in an urban context refer to the networks of natural and semi-natural areas that connect green spaces. Ecological linkages allow for the movement and interaction of species, the flow of natural processes and genetics which enhance ecological resilience within urban environments.

Perry Lakes provides an important stepping stone within the urban environment with opportunities to connect areas of green spaces through:

- parks, gardens and recreational areas
- waterbodies including drains, lakes and wetlands
- tree-lined streets, backyard gardens and remnant bushland
- vacant lots and unmanaged open space.

Ecological linkages can be established and/or enhanced through passive and active management activities which may include:

- public education and awareness strategies
- revegetating degraded areas
- amalgamating areas of remnant bushland pockets
- planting of road verges and median strips
- signage.

5.1.1 Local

Indicative local ecological linkage locations have been outlined in Section 5.3 these linkages are proposed to be a mixture of mid to lower storey grasses, sedges and shrubs planted in high densities that suit various fauna within the area. The area selected has been proposed to support transient movement of fauna such as Quenda between the East Lake, West Lake and Bold Park. Ecological linkages are indicative only and it is expected that the installation of the linkages will be carried out incrementally. Ecological linkages are to be incorporated amongst current and proposed infrastructure within the reserve as per the *Town of Cambridge: Perry Lakes Master Plan 2021-2031* (TOC, 2021b).

5.1.2 Regional

Designated regional ecological linkages serve to link protected patches of regional significance by identifying the best condition patches available as stepping stones for flora and fauna between regionally significant areas (Molloy *et al.,* 2007). Regional linkages need to connect regionally significant patches and biodiversity conservation assets. In a regional context Perry Lakes Reserve is an important part of the Bold Park to Kings Park nature link (Figure 11, (WALGA, 2004)), connecting two of the largest inner-city parks in the world, enhancing passive transfer of genetic material between ecological communities (Haddleton & Donnell, 2021).

Figure 11:

Perth Regional Ecological Linkage Perry Lakes Reserve

Floreat, Town of Cambridge

Legend

- Site Boundary
- Ecological Linkage
- Native Vegetation Extent

Client:	Friends of Perry Lakes
Date:	26/07/2024
Created by:	J.Wei
Image Source:	Esri Satellite, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 50000

0 750 1,500 m

N

5.2 Fauna Habitat

5.2.1 Frogs

There have been six species of native frogs previously recorded within Perry Lakes Reserve (GHD, 2019; Nature Area, 2024; N. Mitchell, personal communication, May 2, 2024). Frog species previously recorded with the reserve require freshwater habitats to complete breeding cycles; with the Moaning Frog (*Heleioporus eyrei*) particularly sensitive to fluctuating water levels, due to reliance on seasonal inundation. Table 8 outlines the species and their general habitat requirements.

Table 8: Frog species within Perry Lakes Reserve

Family	Species	Common Name	Habitat requirements
Lymnodynastidae	*Heleioporus eyrei*	Moaning Frog	Males excavate burrows in low-lying areas which are likely to become inundated by rains. Females enter burrows and deposit their egg mass in a chamber at the bottom of the damp soil. Rising water levels flood burrows allowing the partially developed tadpoles to swim out of the burrows. Tadpoles eventually swim to larger waterbodies where they are often located on the bottom close to aquatic vegetation.
Lymnodynastidae	*Limnodynastes dorsalis*	Western Banjo Frog	Males call from dense overhanging vegetation such as grass and sedges around the waters edge. Eggs are laid into the base of a foam 'raft' which is usually hidden beneath overhanging vegetation. Tadpoles are usually found in deep, permanent water and may be present all year round as development can be slow.
Myobatrachidae	*Crinia insignifera*	Squelching Frog	Males often call from exposed positions either in or alongside open water but can often be found in calling from dense vegetation. Eggs are laid singularly or in small clumps in shallow water where they sink to the bottom, where they often acquire a fine coat of mud. Tadpoles are usually found in the shallows of permanent and temporary water.
Myobatrachidae	*Myobatrachus gouldi*	Turtle Frog	Found almost exclusively on sandy soils, often associated with termite colonies. Males call from

Family	Species	Common Name	Habitat requirements
			partway down a breeding burrow. Burrows may be up to 1.2 m deep.
Pelodryadidae	*Litoria moorei*	Motorbike Frog	Males often call from floating vegetation or within reed beds. They may also call from more open areas or branched of trees. Eggs laid in clumps attached to floating or slightly submerged vegetation. Eggs are held together by a transparent jelly. Tadpoles are often found in vegetation within permanent water bodies.
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog	Males call from elevated perches or from the base if dense vegetation surrounding lakes, swamps and watercourses. Individuals are often found clinging to vertical reeds and sedges. Eggs are laid in small clusters and are attached to the stems of aquatic vegetation just below the surface of the water.

(WA Museum, 2023)

5.2.2 Quenda

Quenda (*Isoodon fusciventer*) live in dense lower storey plant species in and around swamps and/or Banksia and Jarrah woodlands (Department of Biodiversity, Conservation and Attractions (DBCA), 2017). Quenda will usually have several daytime nests within their home range. Nest sites are indentations in the ground hidden beneath a shrub lined with leaves, dry grasses and other soft materials (DBCA, 2017). Increasing the lower storey plant species throughout Perry Lakes Reserve will likely increase the presence of Quenda, supporting the migration of Quenda from Bold Park through to Underwood Avenue Bushland and other adjacent bushlands. Installation of dense lower storey plant species interconnecting the two lakes and Bold Park in the form of 'Quenda corridors' will encourage Quenda into the reserve and give greater protection from predators.

5.2.3 Turtles

Oblong Turtles (*Chelodina oblonga*) live in a broad range of seasonal and permanent freshwater habitats including wetlands, lakes and rivers (Burbidge, 1967). *Chelodina oblonga* is currently listed as 'near threatened' by the IUCN however has not been assessed for 25 years (Santoro et al, 2023).

Oblong Turtles prefer open sandy areas around freshwater habitats with a gentle gradient to facilitate breeding. In order to increase habitat for the Oblong Turtles, the gradients of the bank around East Lake should be assessed and considered when determining suitable areas to increase habitat. Suitable areas should be revegetated with densely planted sedges and regraded to suitable slope (if required).

5.2.4 Birds

A total of 87 bird species have been documented during the GHD, Town of Cambridge and Natural Area basic fauna surveys and Bird Life Data. Open freshwater areas and fringing vegetation provide important habitat and food resources. The fringing sedgelands provide breeding habitat and sanctuary for water birds. Additionally, the woodland areas surrounding the lakes provide food resources and habitat for a number of bird species. In order to increase habitat for bird species it is important to increase the density of sedges fringing the lakes and to have a range of flowering periods to ensure continuity of foraging.

Table 9: Dominant feeding methods of waterbirds present at Parry Lakes Reserve and examples of species.

Dominant Feeding Method	Water Depth	Diet	Habitat requirements	Example species present at Perry Lakes Reserve
Deep Divers	1.0 m – 2.0 m	Often dive in deep water for aquatic invertebrates. Some may feed on fish.	Varies often use old clumps of sedges and reeds in water or exposed logs and trees above open water.	▪ Musk Duck (*Biziura lobata*) ▪ Little Black Cormorant (*Phalacrocorax sulcirostris*)
Shallow Divers	0.8 m – 1.0 m	Often feed on aquatic vegetation, small fish and/or invertebrates.	Nesting areas vary often nest in aquatic vegetation or mound of vegetation anchored to submerged logs, branches or reeds.	▪ Eurasian Coot (*Fulica atra)* ▪ Australasian Grebe (*Tachybaptus novaehollandiae)*
Surface Feeders	0.8 m - 1.2 m	Often filter feeders, some eat insects, seeds and microscopic plants.	Often nest in tree hollows with some nesting on the ground in sedges and reeds.	▪ Grey Teal (*Anus gracilis*) ▪ Pacific Black Duck (*Anus superciliosa)*
Benthic browsers	0.5 m – 0.8 m	Can be vegetarian often feeding on algae and weeds. Others are omnivores grazing on algae insects and molluscs.	Often nest in tree hollows with some nesting on the ground in sedges and reeds.	▪ Black Swan (*Cygnus atratus*) ▪ Australian Shelduck (*Tardorna tardornoides*)
Shallow water foragers	0.2 m – 0.5 m	Often eats small fish, crustaceans, molluscs, amphibians and aquatic insects.	Often nest in flooded or fringing tree. Some nest in loose stick structure over water or on ground.	▪ White-faced Heron (*Egretta novaehollandiae*) ▪ Black-winged Stilt (*Himanotopus leucocephalus*)
Wetland Margin forager	0.0 m – 0.2 m	Often omnivorous feeding on a range of seeds, fruits, plants, molluscs and invertebrates.	Often nest in reed beds above the waterline.	▪ Purple Swamphen (*Porphyrio melanotus)* ▪ Australian White Ibis (*Threskiornis moluccus*)

Dominant Feeding Method	Water Depth	Diet	Habitat requirements	Example species present at Perry Lakes Reserve
Fringing vegetation forager	N/A	Often feed on insects, spiders, molluscs and seed or other herbage near water.	Often nest in tree hollows or reed beds adjacent to water.	▪ Australian Reed Warbler (*Arcocephalis australis*) ▪ Laughing kookaburra (Dacelo novaequineae)

5.3 Revegetation

5.3.1 Revegetation Zones

Revegetation zones have been outlined in Figure 12; these zones have been defined by expected water levels based on the *Perry Lakes Water Level Maintenance Project: Feasibility Assessment* (Rockwater, 2020) and water level meeting AHD of 3.8 m it is estimated that the water level will reduce in summer months to between 2.77 m AHD to 3.2 m AHD as per observations made in 2023-2024; however, this should be monitored for multiple summers to gauge water level fluctuations (DWER, 2024).

Broad revegetation zones have been outlined below (dryland, riparian and emergent) within these revegetation zones detailed planting palettes have been proposed to be installed within each broader zone. These have been outlined in Section 5.4.4 and can be tailored based on the area to be revegetated in a given year. Proposed revegetation areas have been compared with those outlined within the *Town of Cambridge: Perry Lakes Master Plan 2021-2031* (TOC, 2021b). Existing vegetation types, site characteristics and recommendations are outlined in Table 10.

Table 10: Comparison of the Town's revegetation areas and proposed revegetation areas

	Approved Revegetation	**Proposed Revegetation**
Dryland Zone Characteristics	Dryland planting surrounding west of West Lake and northern half of East Lake. This provides a small buffer for fauna alongside the lakes but does not provide protection for fauna moving between lakes or surrounding vegetation. Past revegetation efforts are dominated by *Acacia* and *Grevillea* species which provides important shelter along lake edges for bird species; however, this does not provide much ground cover for fauna such as turtles and Quenda.	The proposed dryland areas will provide shelter for a large range of fauna between the two lakes and into Bold Park. The proposed species list will provide both middle storey and lower storey shelter. Middle storey will consist primarily of *Acacia, Astartea, Kunzea* and *Melaleuca* species. Lower storey is to consist of Cyperaceae and Poaceae species planted in dense clumps and corridors to promote movement of Quenda and other fauna species.
Riparian Zone Characteristics	Areas previously classified as 'riparian' have been primarily reclassified as 'emergent' due to the change in water regime. Past revegetation efforts have been challenging with a large portion of the species being installed unable to withstand being inundated for long periods of time. Species installed included *Melaleuca* species*, Ficinia nodosa* and *Machaerina pallidus,* which are better placed between the riparian and dryland zones.	The proposed riparian zones have been assigned based on the proposed/expected water level of 3.8 AHD with the potential increase in winter and decrease in summer. The riparian zone has been designated to 3.8 AHD and above. Proposed species within this zone have been suggested as they can withstand being inundated for a period of time and consists of both mid and lower storey species. Upper storey species should be considered for installation surrounding lakes edge if non-native species are removed. Upper story species are to be strategically placed along banks with positions of viewpoints and bird hides considered. The proposed planting composition promotes opportunity natural vistas through vegetation without enclosing the wetland.

	Approved Revegetation	Proposed Revegetation
		Riparian zone is to be planted at a higher density than dryland areas with Cyperaceae species to be installed at 5 plants/m^2 with one shrub species per m^2 to be installed. This will create ideal habitat for both water birds and turtle species. Riparian zones include the banks of both lakes and the islands within the lakes. By revegetating the islands within the lakes, it will create a refuge for nesting birds and turtles.
Emergent Zone Characteristics	Previously classified as 'Submerged'. Majority of species did not appear to be or able to be monitored due to being inundated during 2024 survey. The emergent area has been greatly reduced with open water greatly expanded.	The proposed emergent zone has been assigned from 3.8 AHD and below. It is expected to be inundated for a large portion of the year. Proposed species are to be installed at 6 plants/m^2 and consist of Cyperaceae species that can tolerate deep inundation of between 0.3 m to 1 m for prolonged periods.
Further rational for changes to revegetation zones	Large quantity of revegetation zones will be inundated with new water regime. Water depths should be monitored and revegetation within inundated areas should be considered once water regime is determined to ensure greatest success of revegetation. This will allow for approximately 4.5 ha of revegetation to be moved from inundated areas in West Lake to riparian and dryland locations. Provides habitat for fauna surrounding lakes but does not provide habitat or protection for fauna traversing between lakes.	Increased dryland areas support transient movement between lakes and surrounding bushlands. Allows for new water regime to be monitored and fluctuation levels to be determined prior to installation of plants into areas that may potentially be inundated year-round. Ideally water regime will mimic the seasonal variation that naturally occurs. Incorporates current and proposed infrastructure within the reserve to support the multi-use area allowing for education and community awareness surrounding importance of nature links throughout the metro area.

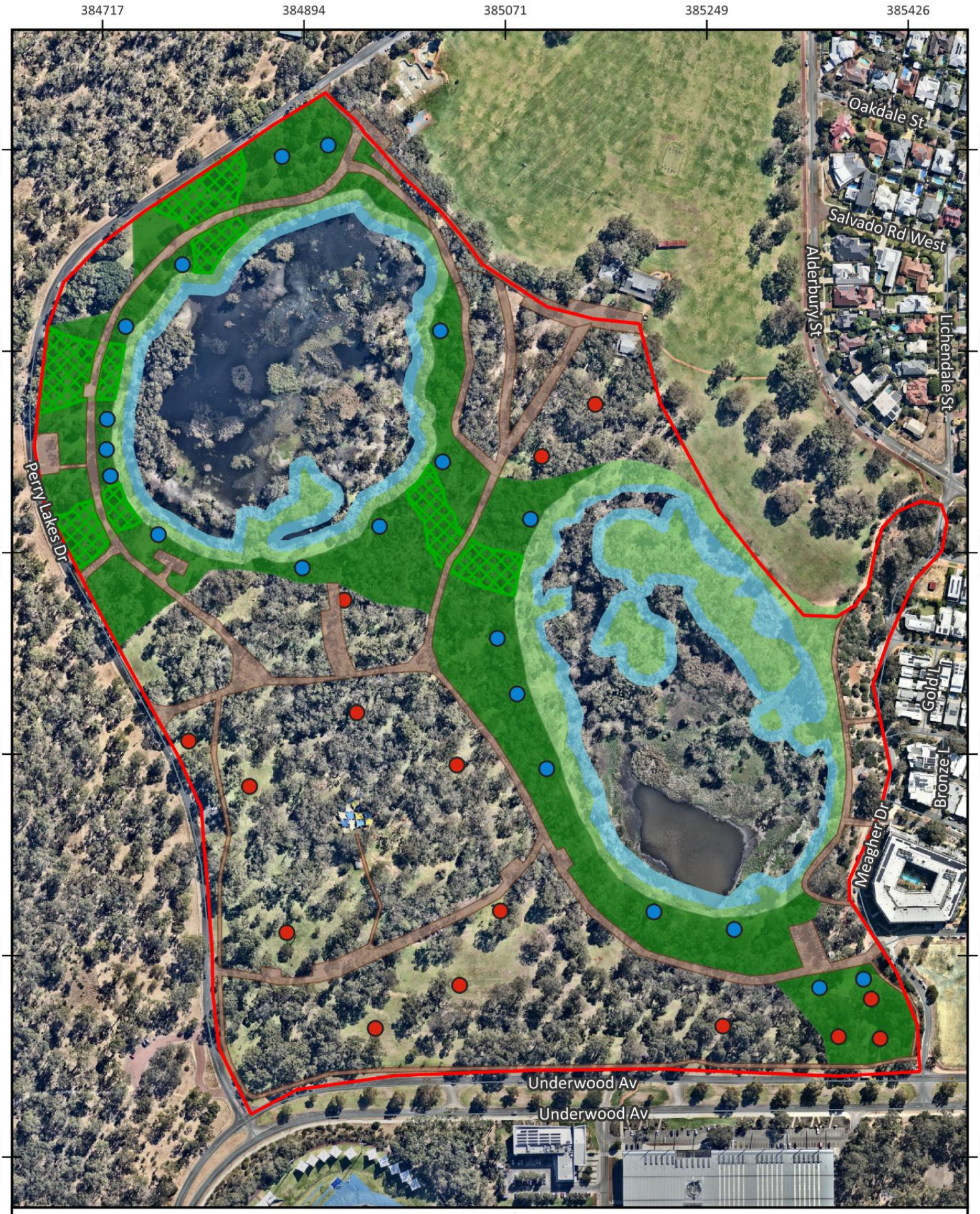


Figure 12:
Proposed Revegetation Zones
Perry Lakes Reserve

Floreat, Town of Cambridge

Legend

- Site Boundary
- Existing Paths
- Dryland Zone
- Riparian Zone
- Emergent Zone
- Quenda Corridors
- Cockatoo Corner
- Reptile Retreat

Client:	Friends of Perry Lakes
Date:	26/07/2024
Created by:	S. Treloar
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4433

0 50 100 m

N

5.4 Revegetation Methodology

Revegetation activities will primarily involve site preparation, planting and maintenance activities as outlined in the following sections.

5.4.1 Species and Composition

To guide the selection of appropriate species and to ensure that the vegetation composition emulates a natural ecosystem, three reference ecosystems were assessed. Each reference was selected based on similar vegetation types falling within 1-5 km of the current metropolitan coastline. The linear geomorphology of the Swan Coastal Plain runs parallel to the coast and allows for generally consistent bands of similar vegetation to occur.

Coastal wetlands bounded by Tuart Woodlands were remotely assessed and then ground-truthed to validate the selection. The following sites were determined as appropriate reference sites to guide the species and composition selection:

- Star Swamp Reserve, Hope Street wetland, City of Stirling
- Beeliar Regional Park, Frog Swamp, City of Cockburn
- Bold Park, Camel Lake, Town of Cambridge

Each site was generally dominated by understorey grasses, sedges, herbs and low sprawling shrubs. Middle storey species were typically clustered sporadically throughout the landscape. This composition favours the proposed revegetation sites within Perry Lakes as it promotes passive surveillance across the landscape providing for increased public safety. The low understorey composition also reduces elevated fuels which in the instance of an unplanned bushfire, will lower intensity and provide for safer conditions for containment.

A complete flora survey was not conducted on the selected reference sites. The species provided are a baseline selection and are targeted at establishing a framework ecosystem. There is opportunity to further increase the diversity of the species selection through further detailed flora assessments. This may open opportunity for involvement for members of FoPL to be trained either internally or externally in flora and fauna survey techniques.

Table 11: Reference sites species and composition description

Reference 1: Hope Street Wetland, Star Swamp, City of Stirling	**Description:**
	Closed *Melaleuca rhaphiophylla* woodland over dense *Gahnia trifida.* Interspersed shrubs including *Acacia saligna, Rhagodia baccata* and *Myoporum caprioides.* Native grasses such as *Sporobolis virginicus* and *Hemarthria uncinata* mixed with herbaceous perennials including *Centella asiatica* and *Lobelia anceps.*
Reference 2: Frog Swamp, Beeliar Regional Park, City of Cockburn	**Description:**
	Open *Eucalyptus rudis* woodland over swathes of *Machaerina juncea* and occasional stands of *Astartea scoparia* and *Melaleuca latertia*.
Reference 3: Camel Lake, Bold Park, Town of Cambridge	**Description:**
	Open *Eucalyptus rudis* woodland over dense *Lepidosperma longitudinale* with a midstorey of *Spyridium globulosum*. Sprawling *Clematis linearifolia* across sedges and midstorey. Scattered *Dianella revoluta, Kennedia prostrata* and *Rhagodia baccata* throughout.

5.4.2 Sourcing Plants

Plants should be sourced from specialised native plant nurseries who are accredited by the Nursery Industry Accreditation Scheme Australia (NIASA). This ensures plants are grown under best practice free of pathogens and weeds.

Consideration has also been given to the availability of revegetation species in specialised commercial native plant nurseries in Perth; however, there may be some species listed which are not commonly available. It is encouraged that groups conducting revegetation work with nurseries to attempt to source uncommon species. This promotes diversity in revegetation and helps develop understanding of propagation of native species within the nursery and restoration industry.

The lead time for most species from germination is usually 8-9 months with some specialist species requiring up to 12 months to source seed, germinate and grow on to a useable size. To ensure the diversity of species can be met, orders should be placed by no later than September for installation in the following May-June period.

5.4.3 Provenance & Genetic Integrity

There are many factors which should be considered when determining appropriate provenance for sourcing plants. While physical proximity to a revegetation site is often selected as the deciding parameter, this may limit the availability of genetic material or appropriate species. Often the community to be revegetated is highly modified from its original state or is highly fragmented from similar communities. While sourcing propagative material from the closest proximity will provide a 'home-ground-advantage', the sourcing of propagative material should be broadened to similar vegetation and soil types while giving consideration to the dispersal mechanism of each taxon. For example, species which are wind dispersed or pollinated may have a broader genetic provenance range than species which drop their seed within close proximity of the parent plant.

To increase genetic integrity, propagative material should be sourced from as many individuals as possible with a minimum target established population of 50 plants from any given taxon.

5.4.4 Planting Palettes

The placement of plants within a landscape is critical to the function of natural ecology. Varying heights, form and cyclical patterns provide variation in the way plants and animals interact. It is often difficult to replicate the spatial moasaic present in natural ecological systems when conducting revegetation works. Revegatation works should allow for transitional zones between ecostystems and allow for stands of single species such as sedges where applicable.

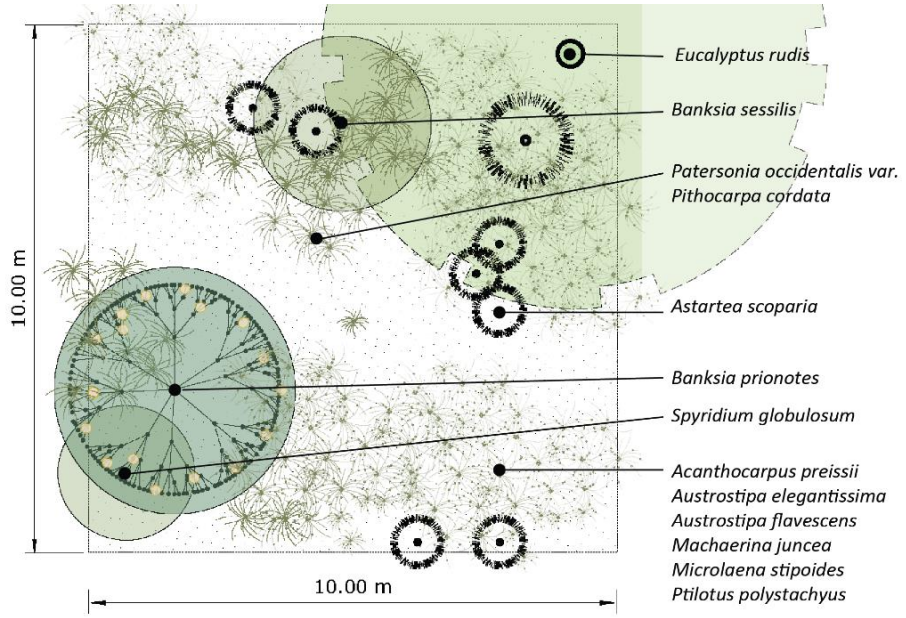
To assist with replicating this spatial mosaic, 'Planting Palettes' have been proposed which outline groups of plants which aim to replicate specific ecosystems which are favoured by key species. The Planting Palettes provided can be applied across the site and provides flexibility within the planning of works. The planting palettes can be scaled up or down to suit the adaptive management requirements of the project area. Proposed palettes are the based on the target ecological community however may take significant time or never reach the target ecological community.

5.4.4.1 *Eucalyptus rudis* Woodland

Low vegetation dominated by sedges and grasses. *Machaerina juncea* stands dominate lower points in the landscape and provide seamless interaction with wetland and riparian zones surrounding the lakes. *Patersonia occidentalis var. occidentalis* forms dense swathes which shelter lizards and beneficial insects, with *Lepidosperma gladiatum* providing a similar habitat in the transitional zones between the lower terrain and the Tuart Woodland of Bold Park.

The low-lying vegetation provides passive surveillance across the landscape, while limiting the spread of fire should it occur. The vegetation is intersected by informal mulch trails, which provide engagement of their user with the surrounding *Eucalyptus rudis* woodland and beyond.

Figure 13: Example of Woodland Zone



Parkland is amalgamated into the natural area, with coarse compacted river sand replacing turfed areas surrounding infrastructure such as park benches and exercise equipment. Mulched areas can extend this open space providing a weed free and open surface. Strategically vegetated fauna habitat areas provide corridors and refuge for a broad range of inhabitants.

Figure 14: Proposed layout of Woodland Zone

Figure 15: Examples of flora and fauna species that may occur within the woodland zone

Table 12: Eucalyptus Woodland Species

Species	Common Name	Form	Suggested Installation Method
Upper			
Banksia grandis	Bull Banksia	Tree	Tubestock
Eucalyptus rudis	Flooded Gum	Tree	Tubestock
Melaleuca rhaphiophylla	Swamp Paperbark	Tree	Tubestock
Mid/Upper			
Banksia prionotes	Acorn Banksia	Tree	Tubestock
Mid			
Acacia cyclops	Coastal Wattle	Shrub	Tubestock
Acacia pulchella	Prickly Moses	Shrub	Tubestock
Acacia saligna	Orange Wattle	Shrub	Tubestock
Astartea scoparia	Common Astartea	Shrub	Tubestock
Banksia sessilis	Parrot Bush	Shrub	Tubestock
Hakea prostrata	Harsh Hakea	Shrub	Shrub
Jacksonia furcellata	Grey Stinkwood	Shrub	Tubestock
Melaleuca lateritia	Robin Redbreast	Shrub	Tubestock
Macrozamia fraseri	Sandplain Zamia	Shrub	Nursery Stock/Seed, cleaned and buried to 100mm
Melaleuca huegelii	Chenille Honey myrtle	Shrub	Tubestock
Myoporum caprarioides	Slender Myoporum	Shrub	Tubestock
Rhagodia baccata	Berry Saltbush	Shrub	Tubestock
Spyridium globulosum	Basket Bush	Shrub	Tubestock
Templetonia retusa	Cockies Tongue	Shrub	Tubestock
Mid/Ground			
Clematis linearifolia	Slender Clematis	Climber	Tubestock
Hardenbergia comptoniana	Native Wisteria	Climber	Tubestock
Xanthorrhoea preissii	Grass tree	Shrub	Use semi advanced stock (grown ~2years in 140mm pots)
Ground			
Acanthocarpus preissii	Prickle Lily	Grass Like	Tubestock
Austrostipa elegantissima		Grass Like	Tubestock
Austrostipa flavescens		Grass Like	Tubestock/Seed

Species	Common Name	Form	Suggested Installation Method
Centella asiatica	Centella	Herb	Tubestock
Conostylis aculeata	Prickly Conostylis	Grass Like	Tubestock
Dianella revoluta	Blueberry Lily	Grass Like	Tubestock
Dichopogon capillipes		Herb	Fertile pots
Ficinia nodosa	Knotted Club Rush	Grass Like	Tubestock
Kennedia prostrata	Running Postman	Herb	Tubestock
Lepidosperma longitudinale	Pithy Sword-sedge	Sedge	Tubestock
Lomandra maritima	Maritime Mat Rush	Grass Like	Tubestock
Machaerina juncea	Bare Twigrush	Sedge	Tubestock
Microlaena stipoides	Weeping grass	Grass Like	Tubestock/Seed
Patersonia occidentalis var. occidentalis	Purple Flag	Grass Like	Tubestock
Pithocarpa cordata	Tangle Daisy	Herb/Shrub	Tubestock
Podotheca gnaphalioides	Golden Long-heads	Herb	Seed
Ptilotus polystachyus	Prince of Wales Feather	Herb	Seed
Trachymene pilosa	Native Parsnip	Herb	Seed

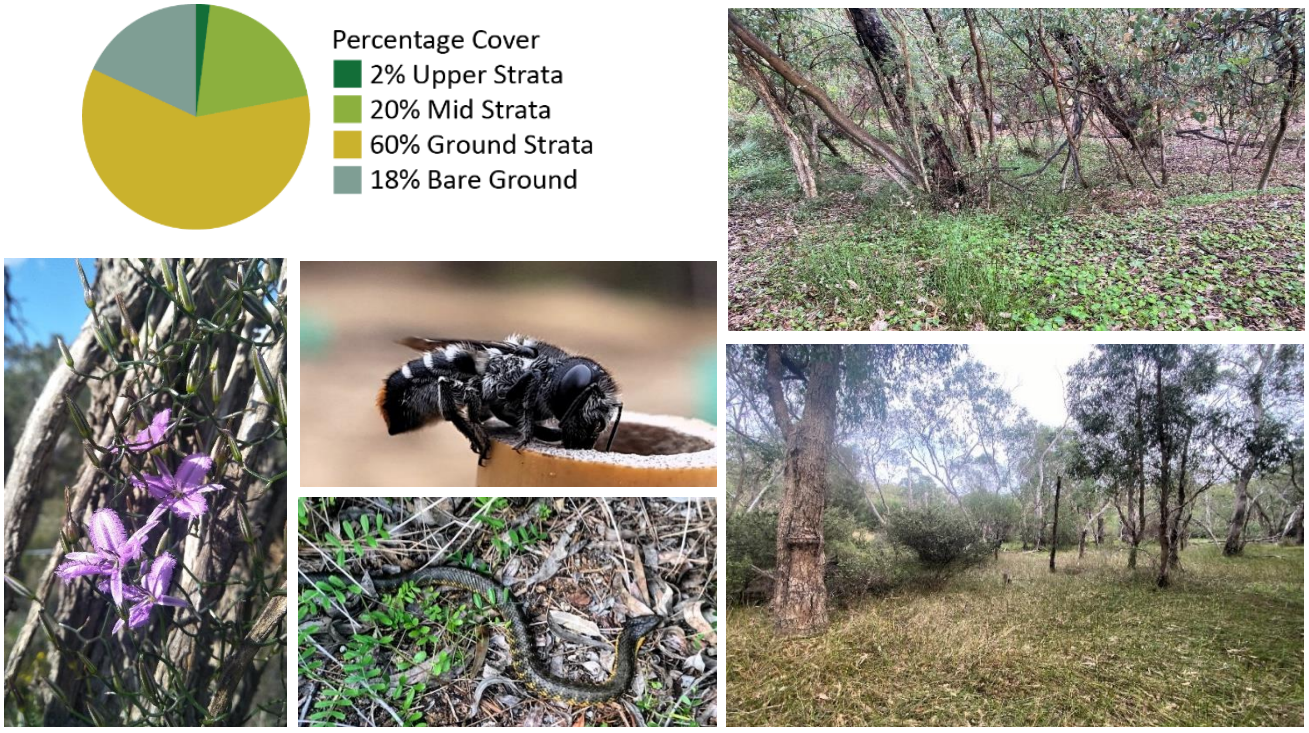


Figure 16: Potential flora and fauna species and target vegetation type for woodland zone

5.4.4.2 Quenda Corridor

A closed canopy of *Melaleuca rhaphiophylla* and *Eucalyptus rudis* cover shade tolerant shrubs scattered between the dense thickets of *Gahnia trifida.* The thickets allow for connected tunnelling and refuge for quenda and ground dwelling birds. Bracken fern meanders throughout, establishing within gaps in the thickets. Spreading grasses create a further layer of vegetation as they intermingle amongst the rest of the vegetation.

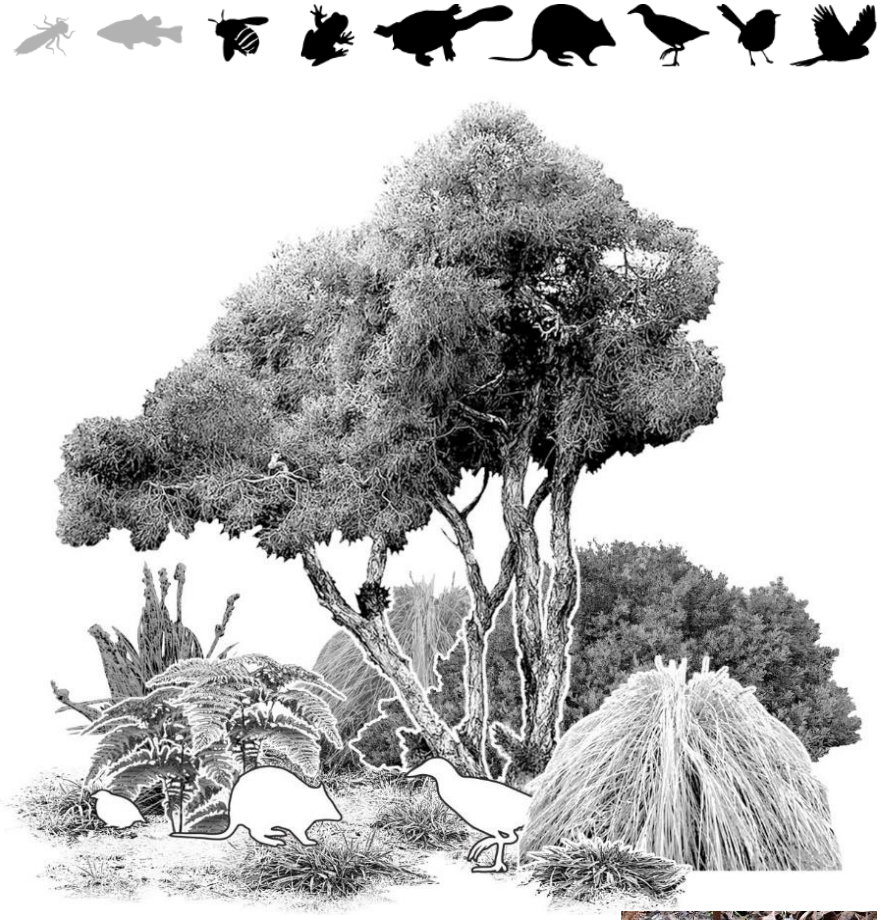


Figure 17: Example of Quenda Corridor

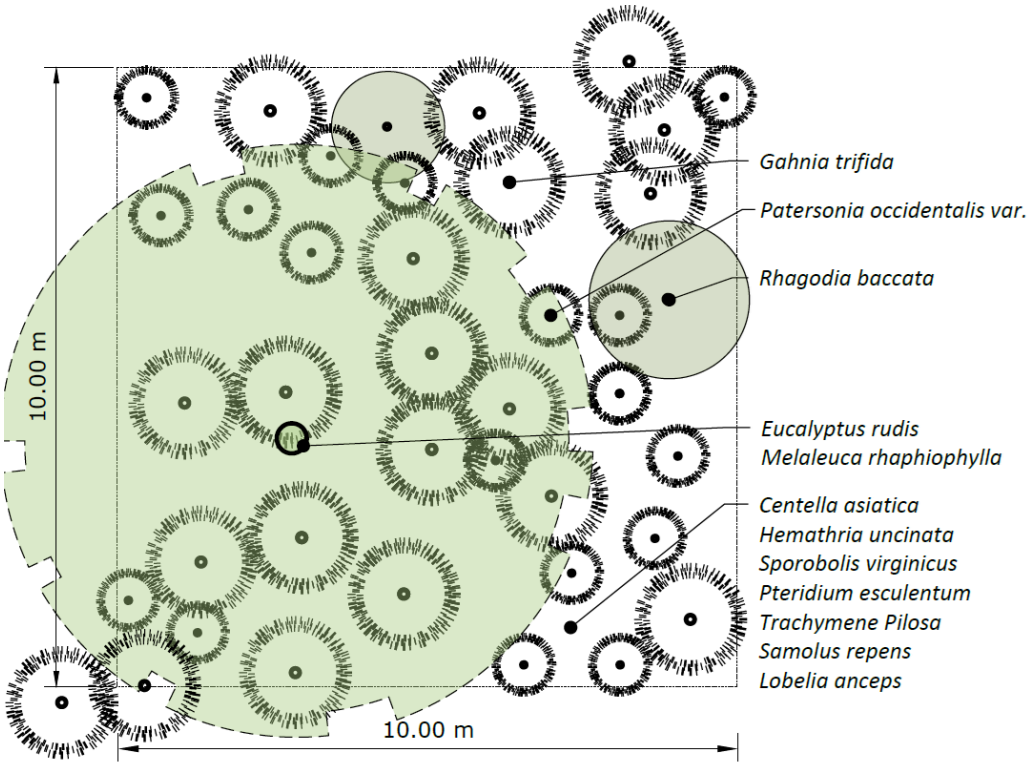


Figure 18: Proposed layout for Quenda Corridor and examples of flora and fauna

Table 13: Quenda Corridor Species List

	Species	Common Name	Form	Suggested Installation Method
	Upper			
	Eucalyptus rudis	Flooded Gum	Tree	Tubestock
	Melaleuca rhaphiophylla	Swamp Paperbark	Tree	Tubestock
	Mid			
	Acacia saligna	Orange Wattle	Shrub	Tubestock
	Gahnia trifida	Coast Saw-sedge	Sedge	Tubestock
	Jacksonia furcellata	Grey Stinkwood	Shrub	Tubestock
	Melaleuca lateritia	Robin Redbreast	Shrub	Tubestock
	Rhagodia baccata	Berry Saltbush	Shrub	Tubestock
	Mid/ground			
	Clematis linearifolia	Slender Clematis	Climber	Tubestock
	Hardenbergia comptoniana	Native Wisteria	Climber	Tubestock
	Pteridium esculentum	Bracken	Fern	Tubestock
	Ground			
	Austrostipa elegantissima		Grass like	Tubestock
	Centella asiatica	Centella	Herb	Tubestock
	Hemarthria uncinata	Mat grass	Grass like	Stolons/Tubestock
	Kennedia prostrata	Running Postman	Herb	Tubestock/Seed
	Lobelia anceps	Angled Lobelia	Herb	Tubestock/Seed
	Microlaena stipoides	Weeping grass	Grass like	Tubestock/Seed
	Patersonia occidentalis var. occidentalis	Purple Flag	Grass like	Tubestock
	Samolus repens	Creeping Brookweed	Herb	Tubestock
	Sporobolus virginicus	Marine Couch	Grass like	Stolons/Tubestock
	Trachymene pilosa	Native Parsnip	Herb	Tubestock

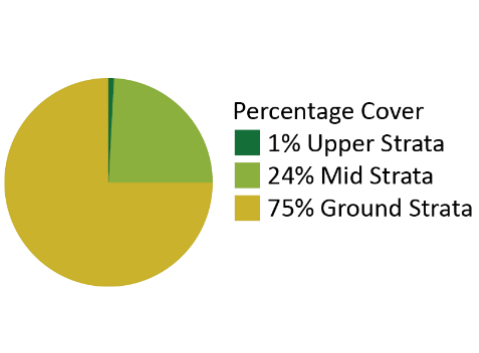


Figure 19: Proposed of example strata composition for Quenda corridor

5.4.4.3 Wetland

Eucalyptus rudis woodland makes way for sedges and wetland herbs leading to the water's edge. Stands of *Carex fasicularis* provide sheltered retreats for waterbirds, while turtles clamber through densly packed *Machaerina articulata*. Dragonfly larvae climb from the water on tall *Schoenoplectus tabernaemontani,* as Western Banjo Frogs stash their eggs amongst the stems. Western Pygmy Perch dart from the cover of *Ottelia ovalifolia* to snatch unsuspecting mosquito larvae.

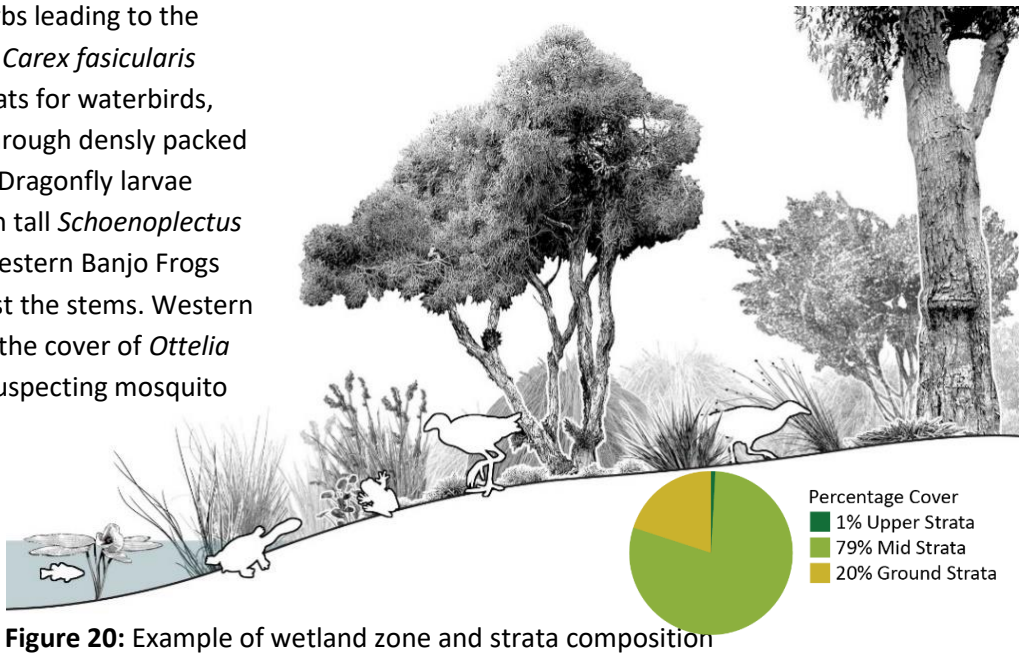


Figure 20: Example of wetland zone and strata composition

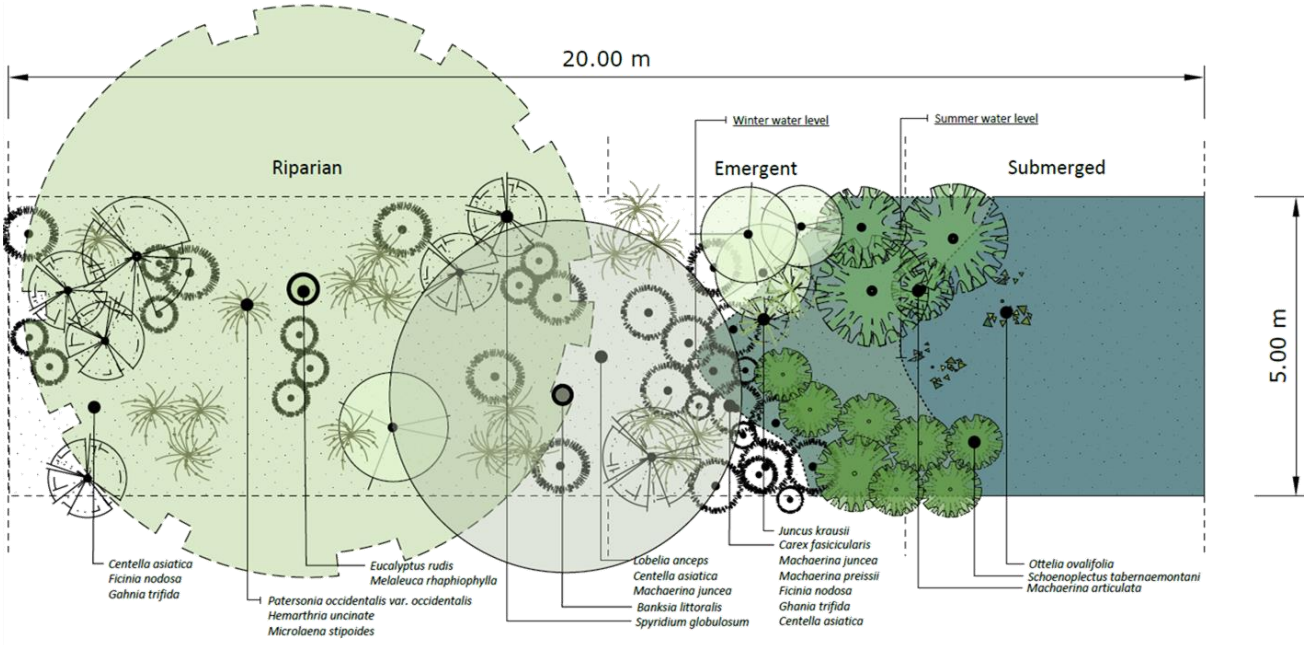


Figure 21: Proposed layout of wetland zones

Figure 22: Examples of flora and fauna that may occur in wetland zone

Table 14: Wetland Palette Species List

Species	Common Name	Form	Suggested Installation Method
Upper			
Banksia littoralis	Swamp Banksia	Tree	Tubestock
Eucalyptus rudis	Flooded Gum	Tree	Tubestock
Melaleuca rhaphiophylla	Swamp Paperbark	Tree	Tubestock
Mid			
Acacia saligna	Orange Wattle	Shrub	Tubestock
Astartea scoparia	Common Astartea	Shrub	Tubestock
Melaleuca lateritia	Robin Redbreast	Shrub	Tubestock
Spyridium globulosum	Basket Bush	Shrub	Tubestock
Juncus kraussii	Sea Rush	Sedge	Tubestock
Gahnia trifida	Coast Saw-sedge	Sedge	Tubestock
Ground			
Lepidosperma longitudinale	Pithy Sword-sedge	Sedge	Tubestock
Machaerina juncea	Bare Twigrush	Sedge	Tubestock
Centella asiatica	Centella	Herb	Tubestock
Kennedia prostrata	Running Postman	Herb	Tubestock
Lobelia anceps	Angled Lobelia	Herb	Seed/Tubestock
Ficinia nodosa	Knotted Club Rush	Grass like	Tubestock
Microlaena stipoides	Weeping grass	Grass like	Tubestock/Seed
Patersonia occidentalis var. occidentalis	Purple Flag	Grass like	Tubestock
Hemarthria uncinata	Mat grass	Grass like	Stolons/Tubestock
Sporobolus virginicus	Marine Couch	Grass like	Stolons/Tubestock
Emergent			
Carex fascicularis	Tassel Sedge	Sedge	Tubestock
Machaerina articulata	Jointed Rush	Sedge	Tubestock/Advanced Stock
Machaerina preissii		Sedge	Tubestock
Schoenoplectus tabernaemontani	Lake Club-rush	Sedge	Tubestock/Advanced Stock
Triglochin mucronata	Prickly Arrowgrass	Aquatic Herb	Unknown
Submergent			
Ottelia ovalifolia	Swamp Lily	Aquatic Herb	Tubestock

5.4.4.4 Reptile Retreat

Voids in the vegetation are deliberately left clear of woody and stolon forming vegetation. Leaf litter accrues over the bare areas and allows for burrowing reptiles and amphibians to breed, nest and aestivate. Tender annuals such as *Trachymene pilosa* and *Ptilotus manglesii* fill in gaps amongst the leaf litter, providing competition for weeds. Spreading shrubs give overhead protection from predating birds yet allow sunshine through their canopy to provide warm areas for basking. Habitat logs sourced from pathogen free tree works within the Town of Cambridge are placed to provide insulation to the soil and a source of invertebrates for hungry skinks and geckos. The voids are surrounded by sedges and grasses which transition back to the *Eucalyptus rudis* Woodland.

Table 15: Reptile Retreat Palette Species List

Species	Common Name	Form	Suggested Installation Method
Mid			
Acacia saligna	Orange Wattle	Shrub	Tubestock
Astartea scoparia	Common Astartea	Shrub	Tubestock
Gahnia trifida	Coast Saw-sedge	Sedge	Tubestock
Juncus kraussii	Sea Rush	Sedge	Tubestock
Melaleuca lateritia	Robin Redbreast	Shrub	Tubestock
Spyridium globulosum	Basket Bush	Shrub	Tubestock
Ground			
Ficinia nodosa	Knotted Club Rush	Grass like	Tubestock
Lobelia anceps	Angled Lobelia	Herb	Seed/Tubestock
Microlaena stipoides	Weeping grass	Grass like	Tubestock/Seed
Patersonia occidentalis var. occidentalis	Purple Flag	Grass like	Tubestock
Trachymene pilosa	Native Parsnip	Herb	Seed

Figure 23: Potential reptiles to use reptile retreat zones

5.4.4.5 Cockatoo Corner

Grouped plantings of cockatoo foraging species are installed throughout the grass parkland areas promoting natural gregarious feeding. The groupings of species provide high value food sources year-round, offering seed, nectar and invertebrates. The isolated pockets throughout the parkland favour larger, potentially more aggressive birds, allowing refuge for smaller birds in other parts of the reserve. Thick mulch keeps the mowing and weed burden low.

Table 16: Cockatoo Corner Palette Species List

Species	Common Name	Form	Suggested Installation Method
Upper			
Banksia grandis	Bull Banksia	Tree	Tubestock
Banksia littoralis	Swamp Banksia	Tree	Tubestock
Banksia menziesii	Firewood Banksia	Tree	Tubestock
Banksia prionotes	Acorn Banksia	Tree	Tubestock
Corymbia calophylla	Marri	Tree	Tubestock
Mid			
Acacia saligna	Orange Wattle	Shrub	Tubestock
Banksia sessilis	Parrot Bush	Shrub	Tubestock

Table 17: Planting Palette and Species List Key

ErW	Eucalyptus rudis Woodland		Upper
QC	Quenda Corridor		Mid
W	Wetland		Ground
RR	Reptile Retreat		Emergent
CC	Cockatoo Corner		Submerged
	Protect new plantings from water birds		Dieback Susceptible Species
			Polyphagous shot-hole borer reproductive and non-reproductive host species (DPRID, 2024)

Table 18: Planting Palette and Species List

		Species	Common Name	Form	Strata	Suggested Installation Method	ErW	QC	W	RR	CC
		Acacia cyclops	Coastal Wattle	Shrub	Mid	Tubestock					
		Acacia pulchella	Prickly Moses	Shrub	Mid	Tubestock					
		Acacia saligna	Orange Wattle	Shrub	Mid	Tubestock					
		Acanthocarpus preissii	Prickle Lily	Grass Like	Ground	Tubestock					
		Astartea scoparia	Common Astartea	Shrub	Mid	Tubestock					
		Austrostipa elegantissima		Grass Like	Ground	Tubestock					
		Austrostipa flavescens		Grass Like	Ground	Tubestock/Seed					
		Banksia grandis	Bull Banksia	Tree	Upper	Tubestock					
		Banksia littoralis	Swamp Banksia	Tree	Upper	Tubestock					

	Species	Common Name	Form	Strata	Suggested Installation Method	ErW	QC	W	RR	CC
	Banksia menziesii	Firewood Banksia	Tree	Upper	Tubestock					
	Banksia prionotes	Acorn Banksia	Tree	Mid/Upper	Tubestock					
	Banksia sessilis	Parrot Bush	Shrub	Mid	Tubestock					
	Carex fascicularis	Tassel Sedge	Sedge	Emergent	Tubestock					
	Centella asiatica	Centella	Herb	Ground	Tubestock					
	Clematis linearifolia	Slender Clematis	Climber	Mid/Ground	Tubestock					
	Conostylis aculeata	Prickly Conostylis	Grass Like	Ground	Ground					
	Corymbia calophylla	Marri	Tree	Upper	Tubestock					
	Dianella revoluta	Blueberry Lily	Grass Like	Ground	Tubestock					
	Dichopogon capillipes		Herb	Ground	Fertile pots					
	Eucalyptus rudis	Flooded Gum	Tree	Upper	Tubestock					
	Ficinia nodosa	Knotted Club Rush	Grass Like	Ground	Tubestock					
	Gahnia trifida	Coast Saw-sedge	Sedge	Mid	Tubestock					
	Hakea prostrata	Harsh Hakea	Shrub	Mid	Shrub					
	Hardenbergia comptoniana	Native Wisteria	Climber	Mid/Ground	Tubestock					
	Hemarthria uncinata	Mat grass	Grass Like	Ground	Stolons/Tubestock					
	Jacksonia furcellata	Grey Stinkwood	Shrub	Mid	Tubestock					
	Juncus kraussii	Sea Rush	Sedge	Mid	Tubestock					
	Kennedia prostrata	Running Postman	Herb	Ground	Tubestock					

	Species	Common Name	Form	Strata	Suggested Installation Method	ErW	QC	W	RR	CC
	Lepidosperma gladiatum	Coast Sword-sedge	Sedge	Mid/Ground	Tubestock					
	Lepidosperma longitudinale	Pithy Sword-sedge	Sedge	Ground	Tubestock					
	Lobelia anceps	Angled Lobelia	Herb	Ground	Seed/Tubestock					
	Lomandra maritima	Maritime Mat Rush	Grass Like	Ground	Tubestock					
	Machaerina articulata	Jointed Rush	Sedge	Mid	Tubestock/Advanced Stock					
	Machaerina juncea	Bare Twigrush	Sedge	Ground	Tubestock					
	Machaerina preissii		Sedge	Emergent	Tubestock					
	Macrozamia fraseri	Sandplain Zamia	Shrub	Mid	Nursery Stock/Seed, cleaned and buried to 100mm					
	Melaleuca huegelii	Chenille Honey myrtle	Shrub	Mid	Tubestock					
	Melaleuca lateritia	Robin Redbreast	Shrub	Mid	Tubestock					
	Melaleuca rhaphiophylla	Swamp Paperbark	Tree	Upper	Tubestock					
	Microlaena stipoides	Weeping grass	Grass Like	Ground	Tubestock/Seed					
	Myoporum caprarioides	Slender Myoporum	Shrub	Mid	Tubestock					
	Ottelia ovalifolia	Swamp Lily	Aquatic Herb	Submerged	Tubestock					
	Patersonia occidentalis var. occidentalis	Purple Flag	Grass Like	Ground	Tubestock					
	Pithocarpa cordata	Tangle Daisy	Herb/Shrub	Ground	Tubestock					
	Podotheca gnaphalioides	Golden Long-heads	Herb	Ground	Seed					

	Species	Common Name	Form	Strata	Suggested Installation Method	ErW	QC	W	RR	CC
	Pteridium esculentum	Bracken	Fern	Mid	Stem cuttings					
	Ptilotus manglesii	Pom Poms	Herb	Ground	Tubestock/Seed					
	Ptilotus polystachyus	Prince of Wales Feather	Herb	Ground	Seed					
	Rhagodia baccata	Berry Saltbush	Shrub	Mid	Tubestock					
	Samolus repens	Creeping Brookweed	Herb	Ground	Tubestock					
	Schoenoplectus tabernaemontani	Lake Club-rush	Sedge	Emergent	Tubestock/ Advanced Stock					
	Sporobolus virginicus	Marine Couch	Grass Like	Ground	Stolons/Tubestock					
	Spyridium globulosum	Basket Bush	Shrub	Mid	Tubestock					
	Templetonia retusa	Cockies Tongue	Shrub	Mid	Tubestock					
	Trachymene coerulea	Blue Lace Flower	Herb	Ground	Seed					
	Trachymene pilosa	Native Parsnip	Herb	Ground	Seed					
	Triglochin mucronata	Prickly Arrowgrass	Aquatic Herb	Emergent	Unknown					
	Xanthorrhoea preissii	Grass tree	Shrub	Mid/Ground	Use semi advanced stock (grown ~2 years in 140mm pots)					

5.4.5 Planting Densities

The required planting densities will be determined by the final target vegetation community, the amount of maintenance resources available and the overall budget of the project. Plantings should be installed as densely as possible to achieve the target coverage quickly, to stabilise the area and outcompete weeds. This is especially important in wetland scenarios where freely available water and nutrients provide optimal conditions for both weeds and native species. Rapidly growing

weeds can easily overtake native species and persistent and frequent weeding may be required; therefore, the faster natives can be established, the sooner ongoing maintenance may reduce. Successional stages should be considered when selecting appropriate species for installation. Many native species play an important role in rebuilding an ecosystem. There are many factors which may need to be considered prior to choosing appropriate species for reintroduction including, weed burden, soil amelioration & biology as well as appropriate microhabitats such as shade and wind protection. Using colonising species to build the ecological frame work, followed by the introduction of more sensitive species may provide for better establishment success and further opportunity to increase diversity.

Table 19 below outlines the recommended initial installation densities per m^2. Planning for revegetation should take into account the need for potential infill in following years (~30 %) and natural attrition of species.

Table 19: Recommended planting densities (plants per m^2)

Form	Eucalyptus rudis Woodland	Quenda Corridor	Reptile Refuge	Cockatoo Corner	Wetland		
					Riparian	Emergent	Submerged
Tree	0.1	0.1		1	0.1	0.1	
Shrub	0.5	0.5	0.25	1	0.5	0.5	
Grass like	2	1	Perimeter Planting		2		
Herbs	Seeded	Seeded	Seeded		1	1	0.5
Sedges	2	4	Perimeter Planting		4	5	3 (advanced)

5.4.6 Installation of Plants

Following site preparation, tubestock is to be installed using augers and/or pottiputkis dependent on the revegetation zone. Plants are to be installed as per Section 5.4.5. Shrubs are to be installed evenly across the site, whilst grasses and sedges are to be installed in groups of the same species to replicate naturally occurring composition. Placement of new trees and any removal of trees needs to be carefully considered to avoid overcrowding. Overstorey is only to be installed in areas with no canopy currently or where weedy tree species have been removed or are to be removed in the future primarily along the lake edges this will help to reduce water temperatures. It is recommended that submerged and riparian areas be planted in summer - autumn as reduced water levels will allow access to the appropriate areas (this timing may change dependent on water regime). Anecdotal evidence indicates that it is likely that wetland plants will be subject to predation from water birds. Installed plants should be netted (Figure 24), or consideration made to using advanced stock where possible.

Figure 24: Protection of sedges using bird netting.

5.4.7 Maintenance

Maintenance will commence one month following the initial site preparation and installation of plants. Activities may vary depending on seasonal variations. It is expected that high weed loads will be present within the site and will likely continue with reticulation present within the site. Maintenance will involve the following activities outlined below:

- Chemical weed control will utilise glyphosate biactive where possible. A small amount of grass selective herbicide may be applied when treating grasses amongst native vegetation. Caution should be used when treating areas adjacent to water bodies. All herbicides should be applied as per label specifications by trained and licenced personnel.
- Hand weeding will occur where herbicides cannot be applied without damaging native species and along waterline.
- General rubbish removal is to be conducted as required.
- Maintenance of tree guards and or netting (if required)
- Maintenance of fencing (if required)

- Watering is to be conducted as required in dry periods (only required if reticulation is removed and plants show signs of heat/water stress).

5.5 Weed Management

A weed treatment program will be implemented to ensure the creation of fauna habitat is optimised.

5.5.1 Weed Control Methodology

Weed control in the context of this plan should aim to provide a reduction in competition to establishing plants and removal all declared pests, WoNS and woody weeds from the reserve. Due to previous and current weed presence, it is expected that a large weed seed bank exists within the soil. 47 weed taxa were noted to occur within the proposed revegetation areas. Weed prioritisation according to the ecological impact and invasiveness for each species is summarised in Table 20 and provided in Table 21. Of the 52 introduced species 13 species were rated to have a '*high*' ecological impact and '*rapid*' invasiveness rating as stated in the *Swan Coastal Plain – Ecological Impact and Invasiveness Rating* (DBCA, 2016).

Table 20: Number of weed species within site based on their impact and invasiveness rating (DBCA, 2016)

	Ecological Impact				Invasiveness			
	High	**Medium**	**Low**	**Unknown**	**Slow**	**Moderate**	**Rapid**	**Unknown**
Number of Species (NA)	21	7	7	18	6	12	26	9
Number of Species (FoPL)	30	8	8	20	6	21	28	11

Characteristics of a particular weed species determine the most appropriate type of weed control method/s and can be found on the FloraBase website (Western Australian (WA) Herbarium, 1998-). Example weed treatments for different species are described in Table 21 and treatment recommendations for the 46 observed taxa in Table 22. One declared pest *Gomphocarpus fruticosus* (cotton bush) was identified during the 2024 survey.

Weed control is to be conducted prior to installation of vegetation to reduce immediate competition. Once plants and seed have been installed extreme care should be taken to avoid damage to emerging seedlings and installed tubestock. It is important that weeds be managed prior to seed setting and are not allowed to get to a size and density which may impact revegetation. All woody weed species are to be treated in a staggered manner so native trees replacing invasive species are of an appropriate size before removing established habitat the invasive flora is providing trees are to be left standing where suitable for habitat. Ongoing weed control will be needed to ensure seedlings are treated prior to reestablishing. Manual weed control should be conducted where required to ensure zero off target damage and no risk of seed being dispersed and herbicide entering the water.

Weed control works should be undertaken both pre and post planting activities and include:

- Slashing of grasses (if required)
- Woody weed control will be undertaken through the processes of basal barking, cut and paint or stem injection. The techniques based on best practice methodologies outlined on FloraBase. For example, suckering woody weed species such as *Schinus terebinthifolius* (Japanese Pepper) are injected with herbicide as opposed to the cut and paint methodology as this will cause the woody weed to succumb to the herbicide before sending out suckers.
- Herbicide application (glyphosate) prior to initial planting to keep weed cover low and ensure successful germination/establishment rates and reduce the seed load in the seed bank within the soil.
- Maintenance spot spray weed treatments following initial revegetation works, to be undertaken at 8-week intervals or as required for a minimum of two years following completion of revegetation.
- Manual weed control should be conducted where required to ensure zero off target damage ensuring no risk of seed dispersal and no risk of chemical entering the waterway.

The FoPL have been collating a weed species list over the past four years these species have been included within the weed species list located in Table 21. The proposed implementation schedule for weed control is provided in Section 8 and weed maps are provided in Appendix 6.

Table 21: Weed Species list including invasiveness and impact ratings and treatment recommendation (DBCA, 2016)

Family	Species	Common Name	FoPL	GHD 2019	NA 2024	Impact	Invasiveness	Treatment Type (Table 22)	Treatment Time
Aizoaceae	*Carpobrotus edulis*	Hotten Fig	*	*	*	H	R	1	Jun - Oct
Aizoaceae	*Tetragonia decumbens*				*	H	R	1	Jun - Oct
Amaryllidaceae	*Allium triquetrum*	Three Cornered Garlic	*			H	M	3	Jun - Jul
Anacardiaceae	*Schinus terebinthifolia*		*	*	*	H	M	5	Jan - Dec
Apocynaceae	Gomphocarpus fruticosus	Cotton Bush	*Dp		*Dp	H	R	1 or 6	Jan - Aug
Araliaceae	*Hydrocotyle bonariensis*		*	*	*	H	U	1	Jan - Apr
Arecaceae	*Livistona eastonii*	Fan Palm			*	U	U	5	Jan - Dec
Arecaceae	*Phoenix dactylifera*	Date Palm	*			U	U	5	Jan - Dec
Arecaceae	*Washingtonia filifera*		*	*	*	U	S	5	Jan - Dec
Asparagaceae	Asparagus asparagoides	Bridal creeper	*Dp	*Dp		H	R	3	Jul - Aug
Asphodelaceae	*Trachyandra divaricata*		*	*	*	M	R	1 or 3	Jun - Sept
Asteraceae	*Cirsium vulgare*	Spear thistle	*	*	*	U	R	1	Apr - Oct
Asteraceae	*Dittrichia graveolens*	Stinkwort			*	M	R	1	Nov - Jan
Asteraceae	*Erigeron canadensis*				*	L	M	1	Nov - Jan
Asteraceae	*Erigeron sumatrensis*				*	M	R	1	Nov - Apr
Asteraceae	*Hypochaeris radicata*	Flat Weed	*	*	*	H	R	1	Jan - Dec
Asteraceae	*Lactuca saligna*	Wild Lettuce		*	*	H	R	1	Jan - Dec
Asteraceae	*Lactuca serriola*	Prickly Lettuce	*		*	H	R	1	Jan - Dec

Family	Species	Common Name	FoPL	GHD 2019	NA 2024	Impact	Invasiveness	Treatment Type (Table 22)	Treatment Time
Asteraceae	*Sonchus asper*	Rough Sow Thistle			*	U	R	1	Jun - Sep
Asteraceae	*Sonchus oleraceus*	Common Sow Thistle	*	*	*	U	R	1	Jun - Sep
Asteraceae	*Symphyotrichum squamatum*	Bushy Starwort	*	*	*	M	R	1	Dec - Feb
Asteraceae	*Taraxacum khatoonae*	Dandelion	*			U	U	1	Jun - Sept
Brassicaceae	*Lobularia maritima*	Sweet Alyssum	*			L	M	1	Jun - Aug
Brassicaceae	*Raphanus raphanistrum*	Wild radish	*			U	M	1 or 6	Jan - Dec
Casuarinaceae	*Casuarina cunninghamiana x glauca*		*			L	S	5	Oct - Apr
Chenopodiaceae	*Atriplex prostrata*	Hastate Orache			*	U	M	1	Jan - Dec
Cupressaceae	*Taxodium distichum*				*	U	U	5	Jan - Dec
Cyperaceae	*Cyperus congestus*	Dense flat-sedge	*	*	*	U	M	1	Jun - Aug
Cyperaceae	*Cyperus tenuiflorus*	Scaly Sedge	*	*	*	U	M	1	Jun - Aug
Euphorbiaceae	*Euphorbia maculata*				*	U	U	1	May - Nov
Euphorbiaceae	*Euphorbia peplus*	Petty Spurge			*	U	M	1	May - Nov
Euphorbiaceae	*Euphorbia terracina*	Geraldton carnation Weed	*		*	H	R	1	May - Nov
Euphorbiaceae	*Ricinus communis*	Castor oil plant	*		*	M	R	1, 5 or 6	Nov - Jun
Fabaceae	*Acacia longifolia*		*	*		H	R	5 or 6	Jan - Dec
Fabaceae	*Lathyrus tingitanus*	Tangier Pea	*	*		M	M	3	Jun - Aug

Family	Species	Common Name	FoPL	GHD 2019	NA 2024	Impact	Invasiveness	Treatment Type (Table 22)	Treatment Time
Fabaceae	*Lupinus cosentinii*		*			H	M	1 or 6	Jun - Sep
Fabaceae	*Medicago polymorpha*	Burr medic			*	U	R	1	Jun - Aug
Fabaceae	*Melilotus indicus*		*		*	U	R	1	Jul - Dec
Fabaceae	*Vicia sativa*	Common Vetch	*	*		U	U	1 or 3	Jul - Sep
Fumariaceae	*Fumaria capreolata*	Whiteflower fumitory	*	*		H	R	3	Jul - Sep
Geraniaceae	*Pelargonium capitatum*	Rose pelargonium	*	*	*	H	R	1, 3 or 6	Jun - Oct
Lamiaceae	Marrubium vulgare	Horehound	*Dp			U	U	1 or 6	Jun - Aug
Malvaceae	*Brachychiton populneus*	Kurrajong	*	*		H	M	5	Sep - Apr
Malvaceae	*Lagunaria patersonia*				*	L	S	1	Jan - Dec
Malvaceae	Malva arborea	Tree Mallow	*			H	M	1 or 5	Jun - Oct
Malvaceae	*Malva parviflora*	Marshmallow	*	*	*	L	U	1	Apr - Jun
Meliaceae	*Melia azedarach*	White cedar	*	*		L	M	5	Nov - Mar
Moraceae	*Ficus sp.*		*			H	M	5	Jan - Dec
Myrtaceae	*Eucalyptus botryoides*		*	*	*	H	M	5	Jan - Dec
Myrtaceae	*Eucalyptus camaldulensis*		*	*	*	L	M	1 or 6	Nov - Apr
Myrtaceae	*Eucalyptus cladocalyx*		*	*	*	H	M	5	Jan - Dec
Myrtaceae	*Eucalyptus globulus*		*	*	*	L	S	5	Jan - Dec
Myrtaceae	*Melaleuca citrina*		*	*	*	U	U	5	Jan - Dec
Myrtaceae	*Melaleuca linariifolia*		*	*	*	H	M	5	Jan - Dec

Family	Species	Common Name	FoPL	GHD 2019	NA 2024	Impact	Invasiveness	Treatment Type (Table 22)	Treatment Time
Myrtaceae	*Melaleuca nesophila*	Mindiyed	*	*	*	U	M	5	Jan - Dec
Myrtaceae	*Melaleuca quinquenervia*			*	*	U	U	5	Jan-Dec
Oleaceae	*Olea europaea*	Olive			*	H	R	5	Jan - Dec
Onagraceae	*Oenothera laciniata*				*	L	S	1	Jun - Nov
Oxalidaceae	*Oxalis pes-caprae*	Sour sob	*			H	S	3	Jun - Jul
Phytolaccaceae	*Phytolacca octandra*	Red Ink Plant	*			U	M	1 or 6	Apr - Dec
Pinaceae	*Pinus radiata*	Radiata Pine	*	*		U	M	5	Jan - Dec
Plantaginaceae	*Bacopa monnieri*				*	H	R	1 or 6	Jan - Dec
Plantaginaceae	*Plantago lanceolata*	Ribwort Plantain	*			U	U	1 or 6	May - Oct
Plantaginaceae	*Plantago major*	Greater Plantain	*			U	U	1 or 6	Jun - Oct
Poaceae	*Avena barbata*	Bearded Oat			*	H	R	1 or 2	Jun - Oct
Poaceae	*Avena fatua*	Wild Oat	*			H	M	1, 2 or 6	Aug - Nov
Poaceae	*Brachypodium sp.*	False Brome	*	*		U	R	1	Jul - Sep
Poaceae	*Bromus catharticus*	Prairie Grass	*			H	R	1 or 2	Jun - Nov
Poaceae	*Bromus diandrus*	Great brome	*			H	R	1 or 2	Jun - Nov
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass		*	*	H	S	1 or 2	Nov - Apr
Poaceae	*Cynodon dactylon*	Couch	*	*	*	H	R	1 or 2	Nov - Apr
Poaceae	*Ehrharta calycina*	Perennial Veldt Grass	*		*	H	R	1 or 2	Jun - Sept
Poaceae	*Ehrharta longiflora*	Annual Veldt Grass	*			M	R	1 or 2	Aug - Oct

Family	Species	Common Name	FoPL	GHD 2019	NA 2024	Impact	Invasiveness	Treatment Type (Table 22)	Treatment Time
Poaceae	*Hordeum leporinum*	Barley Grass	*			H	U	1 or 2	May - Aug
Poaceae	*Lagurus ovatus*	Hare's Tail Grass	*	*		H	R	1	Jun - Oct
Poaceae	*Lolium perenne*	Perennial Ryegrass	*			H	R	1 or 2	Jun - Jan
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*			H	R	1 or 2	Jun - Jan
Poaceae	*Paspalum urvillei*	Vasey Grass			*	H	M	1	Oct - Mar
Poaceae	*Phalaris canariensis*	Canary Grass	*			M	U	1 or 2	Jun - Aug
Poaceae	*Poa annua*	Winter Grass			*	L	R	1	Jun - Dec
Poaceae	*Stenotaphrum secundatum*	Buffalo Grass	*			H	S	1 or 2	Nov - May
Polygonaceae	*Persicaria lapathifolia*				*	U	U	1	Jan - Dec
Polygonaceae	*Rumex acetosella*	Sorrel	*		*	U	R	1	Jun - Dec
Polygonaceae	*Rumex crispus*	Curled Dock	*			U	R	1	Jun - Dec
Polygonaceae	Rumex hypogaeus		*			L	R	1 or 6	May - Aug
Primulaceae	*Lysimachia arvensis*	Pimpernel			*	U	R	1	Jun - Nov
Salicaceae	*Salix babylonica*		*	*	*	M	S	5	Jan - Dec
Solanaceae	*Solanum nigrum*	Black Berry Nightshade	*	*	*	M	R	1	Jul - Jan
Tropaeolaceae	*Tropaeolum majus*	Garden Nasturtium	*	*		L	M	1	Jun - Sept
Typhaceae	*Typha orientalis*	Bulrush	*nat	*nat	*nat	H	R	1	Oct - Mar
Verbenaceae	*Phyla nodiflora*		*		*	H	U	1	Jan - Dec

(Source: WA Herbarium, 1998-; GHD, 2019) * denotes declared pest

Table 22: Weed treatment types, target species and methodology (green indicates treatment type recommended in Table 21)

Treatment Number	Treatment Type	Targeted Species	Application Method and Comments
1	Non-selective (Glyphosate)	Annual and perennial grass and broadleaf weeds	Spot spray target species
2	Grass selective (e.g., Fusilade)	Annual and perennial grasses	Spot spray - selective grass spray (will affect native grass species)
3	Selective (Metsulfuron)	Annual broadleaf weeds and bulbs	Spot spray – semi selective
4	Wick wipe non-selective (Glyphosate wipe) or spot spray selective (Metsulfuron)	One-leaf Cape Tulip	Wipe leaves with sponge prior to or just on flowering
5	Woody weeds (Triclopyr, or Glyphosate)	Woody weeds and trees	Cut and paint, basal bark or drill and fill. (Method is species dependant as some are prone to suckering e.g., *Schinus terebinthifolia*)
6	Manual removal/hand weeding	Carnation weeds (*Euphorbia* sp.), Fleabane (*Erigeron* sp.) and other similar species including woody weed seedlings when small	Gloves required due to caustic sap of Carnation Weeds
7	Selective (Triasulfuron)	Carnation weeds (*Euphorbia* sp.), Brassicaceae weeds post emergence and other annual species	Spot spray – selective
8	Non-selective (Glyphosate) and selective (Metsulfuron)	Black Flag (*Ferraria crispa*)	Spot spray when flowering, may take several years to control populations

(Source: Brown and Brooks, 2002; WA Herbarium, 1998-)

Metsulfuron and other Group B herbicide application should occur once a year at the recommended rate to reduce the potential for residual effect in soils, which can lead to some species becoming resistant and associated death of non-target species. Selective herbicides outlined in Table 22 should only be applied as per label rates, if applied at a higher rate herbicide may be considered as non-selective. Herbicide application should always be conducted by licenced personnel and occur as per best treatment methodologies and as per the manufacturer's usage and safety specifications as detailed on labels and Safety Data Sheets (SDS). Herbicide application works can enable the targeting and treatment of several species during the same management event, reducing the number of events.

Aquatic ecosystems are particularly sensitive to herbicide and surfactant contamination, with possible toxic effects on native plants, invertebrates, fish and amphibians as well as possible risks to human health. Herbicides can enter waterbodies either directly through spray or spray drift, or via surface water run-off or leaching and sub-surface draining. Therefore, careful application of herbicides within the rehabilitation site is important to avoid contamination of the wetland.

5.6 Pest Management

Feral or pest animals impact the environment and ecosystem, they can degrade vegetation that provides food and shelter for native fauna, prey on the native fauna, and even place a risk to the survival of native fauna and threatened species.

Declared pests are listed on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management Act 2007* (WA) (DPIRD, 2023). This classification requires the landowner/land manager to control the population to limit damage as a result of the presence of these species (DPIRD, 2019b).

Feral animal control can be undertaken through a variety of methods including fencing, trapping, baiting, and shooting. Feral animal control is to be undertaken by Licenced Pest Management Technicians (LPMT). Targeted ground shooting is subject to approval by Western Australia Police. Feral animal control should prioritise Rabbit and Red Fox populations, adaptive management should be undertaken until the populations are controlled and the detrimental environmental impacts are reduced.

5.6.1 Rabbit Control

Rabbit populations impact the environment by competing with native fauna, overgrazing, preventing regeneration and plant succession, altering ecological communities, and changing soil structure and nutrient cycling leading to erosion (Department of the Environment and Energy (DEE), 2016). Rabbits can support increased population densities of pest predation and promote the spread and growth of weed species.

5.6.2 Fox Control

Red Foxes predate on native animal species and can deplete populations of threatened fauna and alter ecosystem processes (Department of the Environment, Water, Heritage, and the Arts (DEWHA), 2008a; DEWHA, 2008b).

The recommended control for Red Foxes is to undertake trapping, and targeted ground shooting. Red Fox trapping should be conducted from October to December focusing on known den locations, from December to February targeting cubs, and from May to July targeting adult Red Foxes to disrupt the breeding cycle.

5.6.3 Cat Control

Cats were recorded within Parry lakes by both GHD and the Town (GHD, 2019; TOC, 2021). Cats predate on native fauna species and can deplete populations (Commonwealth, 2015).

In Australia cats are grouped into three difference categories, despite the separate categories, they refer to the same species and all have the potential to be a significant threat to native fauna. The three categories guide management actions that can be undertaken to mitigate the impact of cats on the natural

environment. Individual cats may move between the categories and only cats within the feral category are classed as declared pests.

Accepted control techniques for feral cats include exclusion fencing, shooting, trapping, and baiting. Due to the proximity of the reserves to urbanised areas, shooting and baiting techniques are not recommended as there is a potential of off-target damage to free-roaming domestic cats. It is recommended that trapping is undertaken to control feral cats, this method is effective in targeting known locations of feral cat populations. It is recommended to control domestic and stray cats that the Town promotes responsible pet ownership through education and awareness campaigns and develop signage to inform the public. The Towns *Animals Local Law 2016* (WAGG, 2017) states that each cat must be contained on the premises unless under the effective control of a person. The development of penalties to reinforce the local law may help in reducing the damage of domestic cats in conservation areas.

5.6.4 Feral Fish Control

The establishment of the HMD diversion could potentially introduce feral fish into the Perry Lakes ecosystem. It is likely the eggs will move through the diversion despite the presence of pollutant traps. The most effective way to control the presence of feral fish would be to allow the lakes to dry up for a period of time over the summer period. Other methods to remove feral fish include electrofishing however it is unlikely this would be a feasible option for Perry Lakes.

5.7 Artificial Habitat Enhancements

Potential artificial habitat enhancement rational and feasibility are outlined in Table 23.

Table 23: Potential artificial habitat enhancements and feasibility

Habitat Enhancement	Rationale	Feasibility (Y/N)
Turtle refuge	Designated areas for turtle refuge are a good way to create awareness of the species in the area. These areas require bare areas of sand with low canopy cover to reduce potential predation.	Y
Quenda hotel	Installation of quenda hotels is a good way to provide shelter in areas that have been impacted by fire and/or clearing; however, hotels should not be required if revegetation is undertaken. If installed, predation from foxes may increase as they may target designated areas.	N
Bat boxes	Bat boxes have been installed within the reserve; however, they are not maintained or monitored. There are records of six species within the reserve. Ongoing monitoring and maintenance need to occur to ensure feral species are not utilising the boxes for it to be beneficial to the bat species.	Y
Bird nesting boxes	If installed need to determine target species that nest within the area and that nest hollows are designed for the target species. Ongoing monitoring and maintenance will be required as per	Y

Habitat Enhancement	Rationale	Feasibility (Y/N)
	Section 6 and Appendix 7. Nesting boxes for species that do not nest in the area should not be installed (Black Cockatoo species).	
Fauna tunnel/speed bump	Fauna tunnel proposed to be installed along Perry Lakes Drive. The tunnel is to be installed to act as a speed bump therefore reducing speed limits and potential deaths to fauna from vehicle. However, it is expected that fauna will be predated upon via foxes etc. as they may target these areas. If implemented, is it recommended that a vertebrate pest management program be implemented due to potential elevated predation.	N
Floating wetlands/habitat	Floating habitat can provide refuge from predators such as foxes and cats; however, if water level is not stable habitat value is significantly reduced and plant species will likely die. Minimum water levels will need to be confirmed to determine the value of the potential habitat. Room to develop to include turtle nesting opportunities and install roosting and nest habitat for bird species. Large plant stock required as tubestock can be prone to predation from native bird species. Requires ongoing maintenance.	N

5.8 Hygiene Management

Hygiene management is an important component of any successful revegetation project as it can affect success of revegetation. Hygiene management in terms of weeds and Dieback are discussed within this section.

5.8.1 Dieback Hygiene and Management

A dieback assessment and plan has not been carried out for Perry Lakes Reserve and should be considered during revegetation works. The plan should be implemented and personnel entering site should be made aware of any contamination on site.

Although it is not known if Dieback (*Phytophthora*) occurs within the site, best management practices are recommended be followed. *Phytophthora cinnamomi* or Dieback is an introduced fungal pathogen with a widespread distribution in areas of south-west Western Australia. The fungus acts by infecting the roots, absorbing the carbohydrates and nutrients from the plants and causing the roots to rot. Dieback spreads quickly down slopes in surface and sub-surface water flow as well as uphill via root-to-root contact. Human activities cause the greatest spread of Dieback through the natural landscape. The pathogen can enter bushland sites via infected soil on footwear, vehicles and equipment.

Currently no method of completely eradicating *Phytophthora* has been discovered; as such, management methods and objectives are geared toward minimising the spread into uninfected areas and to mitigate the

impacts of the fungus where infections are present. Hygiene management at the site should be carried out in a manner that reduces the risk of moving infected material from one location to another.

Hygiene management at the site should be carried out in a manner that reduces the risk of moving infected material from one location to another. The following precautions should be followed:

- Vehicles are to remain on designated vehicle tracks unless it is necessary for management purposes.
- All vehicles, equipment and footwear are to be free of soil/mud before entering and departing the project area.
- All personnel working at the site are to wash down equipment and shoes prior to working on the site with a disinfectant solution of 70 % disinfectant (methylated spirits) to 30% water. Cleaning of all tools, footwear and vehicle tyres should be conducted before and after working at the site (Figure 25).

Figure 25: Example washdown procedure of shoes and vehicles for dieback control.

5.8.2 Weed Hygiene Management

The introduction of weeds into a site can have negative effects on revegetation establishment. Weed seeds can be spread a variety of ways, including on tools, equipment, and footwear. The following procedures should be implemented to mitigate the spread of weed seed as a result of rehabilitation activities:

- Ensure vehicle tyres/tracks are clean and free of weed seed when entering and exiting the site.
- Ensure equipment, tools and footwear are clean and free of weed seed when entering and exiting the site.
- Any weed material removed from site should be transported in a manner that prevents the spread of weed seed during transit.
- Any weed material removed from site should be disposed of at an appropriate green waste disposal facility.

5.9 Threats and Contingencies

Table 24: Revegetation threats and contingencies

Threat	Potential Impact	Contingency Measure
Damage from native birds to installed plants	Reduced survival rates of tubestock.	Tubestock is sometimes predated by wetland bird species, in particular Purple Swamp Hens (*Porphyrio porphyrio*). Plants should be installed deep enough to discourage the birds from pulling the plants out. Inspections should be conducted regularly post planting to assess if any damage is occurring and reinstate if necessary. Infilling with plants which are less favourable to birds should be considered; however, this is hard to assess. Consider installation of bird netting to sedges for establishment period (approx. 6 months).
Trampling by Pedestrians	Pedestrians may access the site resulting in damage to the plantings.	The use of habitat logs will assist with delineating the former public open space to represent more of a natural area, which will be less accessible to pedestrians. If pedestrian access is severe, consideration may be made to fencing the site or installing tree guards as appropriate.
Unforeseen weed load present	The area has been mown for a long period of time; it is hard to determine which weeds might be present within the site.	Regular weed control and maintenance is expected to manage the weed burden in the site. Additional weed control events may be needed if excessive germination occurs amongst native species. Receding water levels beyond the planting areas may also expose areas which are susceptible to weed invasion. Regular informal monitoring will be conducted during maintenance events and weed loads assessed. Any signs of excessive weed load will be relayed to the Town and or friends' group for consideration of additional maintenance events.
Fire within the site	Fire within the site poses a risk to human safety and the environment. The risk of fire	Plant composition has been prescribed to ensure the middle storey vegetation is not excessively

Threat	Potential Impact	Contingency Measure
	during the establishment period is low, due to the low potential of continuous fuel. Increased fire rating to surrounding area.	thick, reducing ladder fuels and lowering fire intensity. The site is bounded by large areas of park land with reticulation. As such, the ability for a fire to spread is limited and the ability to defend assets is not compromised. Fire within the site during the establishment period may result in the death of establishing plants and impair the vegetations ability to regenerate. Replanting may be considered in this event.
Long hot summers impacting survival rates	It has been observed that summer rainfall and high temperatures are harder to predict. While native plants are accustomed to these periods, they are susceptible to harsh conditions particularly when establishing.	If it is noted that particular species are not coping with site conditions, these will be excluded from species used during infill planting. Installing plants as early in the winter months as possible will give the plants the longest establishment time possible which will assist in their ability to tolerate dry conditions. Reticulation is present within the site, and it is unlikely that watering will be required.
Disease, dieback and pathogens	Introduction of pests and diseases reducing habitat values and revegetation success.	Undertake regular monitoring and ensure contractors etc. are maintaining proper hygiene protocol.
Polyphagous shot hole borer infestation	Decline in vegetation condition and deaths of established tree species (Both introduced and native)	Monitoring of trees to detect infestation quickly. follow recommendations by DPIRD. Following removal of infested individuals consider implementing a tree replacement program.
Predation on native fauna from feral animals	▪ Fox predation on native fauna ▪ Cat predation on native fauna ▪ Colonisation of Feral fish	Vertebrate pest management program to be implemented as per Section 5.6. Consider additional events if program is already in place.
Algae blooms and increased nutrients	Deoxygenation and poor water quality causing fish kills, algal odour, loss of aesthetic appeal, production of toxins, midge	Undertake regular water monitoring. If there is a significant decline in water quality, undertake mitigation measures and additional monitoring until water is within ANZG parameters. Consider

Threat	Potential Impact	Contingency Measure
	swarms, bird deaths through algal toxicity or botulism and potential health risks associated with people or animals encountering water containing toxic algae.	recommendations from water monitoring company to reduce risks of further decline of water quality. Consider harvesting plant material within the lakes such as *Typha* sp. to reduce overall phosphorus (Kg) within the lake's water column. Other mitigation measures such as the use of Phos lock and drying out the lakes over summer should also be considered.
Fluctuation of storm water input	Significant increase or decrease in water levels causing deaths to revegetation.	Undertake regular water level monitoring to determine fluctuation levels and reassess planting zones.

6.0 Monitoring Program

6.1 Water Management and Monitoring

It is recommended that water levels are taken monthly to monitor fluctuations of water levels in relation to inputs. This should be tracked over time to determine what the expected water regime will look like in the future. This will help to inform further revegetation and weed control activities.

A full suite of water quality monitoring is currently undertaken on a biannual basis algal composition monitoring is also recommended. If water quality is seen to be declining it is recommended that this is increased to a quarterly basis and recommendations from the contractor to be considered and implemented. If water quality continues to decline, further management actions are to be considered including allowing lakes to dry out over the summer period.

6.2 Habitat Enhancement Monitoring Requirements

If any habitat enhancements such as nesting boxes are installed, they should be monitored and maintained on a regular basis. Any nesting boxes installed should be monitored quarterly at a minimum with maintenance taken place prior to breeding season of the fauna species that the boxes are intended for. Example hollow and nest box monitoring sheets are provided in Appendix 7.

6.3 Revegetation Monitoring and Completion Criteria

Monitoring of the revegetation activities of the site is recommended to occur biannually in spring and autumn. Autumn monitoring events will allow assessment of plants which are likely to persist through the drier months and allow enough time to place plant orders to meet infill requirements. Spring monitoring events will allow for an assessment for annual species and give an accurate representation of the weeds present across the site. This will allow for adaptive management processes to put in place.

Monitoring should continue biannually for a minimum of two years. Example monitoring sheets are provided in Appendix 8. Revegetation monitoring should include:

- Installation of permanent photo monitoring points to enable comparison of the area over time, photographs taken from northwestern corner and southeastern corner.
- Installation of permanent 5 x 5 m quadrats will be set up across the offset site, with quadrats set up across each revegetation sections. There should be a minimum of two quadrats per revegetation stage. Plant survival, vegetation health, community structure and any other relevant observations will be noted, with photographs taken from northwestern corner.

The data collected during the revegetation monitoring events assessment will include:

- evidence of recruitment
- vegetation structure, recording dominant growth form, height, cover and species
- total vegetation coverage
- species richness
- weed coverage including presence of woody weeds, WoNs or declared pests
- rubbish presence
- fence condition (if applicable).

The data collected during the monitoring event should be analysed in reference to the completion criteria with the trigger values and corrective actions provided in Table 25.

Table 25: Revegetation proposed completion criteria and corrective actions

Attribute	Completion Criteria	Trigger values for corrective actions	Corrective action
Weed cover (maximum)	Less than or equal to 10 % weed cover	More than 10 %	Undergo weed management activities
Total native species density/coverage	3 plants per m^2 or $\geq$ 80 % coverage for dryland areas	Less than 3 plant / m^2 or < 80 % coverage	Plant additional native flora species consider adjusting revegetation zones to match water regime and expected levels.
	6 plants per m^2 or $\geq$ 80 % coverage for riparian and emergent areas	Less than 6 plant / m^2 or < 80 % coverage	
Declared pests and WoNS	Declared pests and WoNS are absent from the revegetation area	Declared pest or WoNS present	Remove declared pest and WoNS
Rubbish	No rubbish present	Rubbish present	Undertake rubbish removal

7.0 Proposed Infrastructure

Various forms of infrastructure have been proposed for installation within the reserve including, paths, bird viewing structures and fencing. Each form of proposed infrastructure provides opportunities to create public awareness regarding the importance of habitat enhancement via revegetation and diversity native fauna present within the reserve. Locations of proposed infrastructure is outlined in Figure 26. Installation of signage will further support this increasing the educational values this can include items such as the proposed planting pallets (Section 5.4.4). Signage proposed to be installed along Perry Lakes Drive to mitigate potential mortalities when fauna migration events are expected to occur between Perry Lakes and Bold Park. Fencing is to be installed to the north of East Lake to reduce the impact of off leash dogs from the dog exercise area. Additional fencing should be considered if vegetation is being significantly impacted via the public.

Installation of informal paths throughout the proposed revegetation and current infrastructure will help in reducing potential trampling of vegetation from the public. Material to be used for the paths should be considered at the time of installation to ensure potential leaching of the materials in the lakes will have minimal to no effect to the water quality.

Bird viewing structure to be installed at key locations of each lake will further increase public interactions within the reserve whilst protecting revegetation and fauna species. Indicative locations are outlined in Figure 26 it is recommended that two to three of the five locations are chosen. Bird viewing structures have the potential to create destinations within the reserve to complement existing uses of the reserve and supplement educational opportunities.

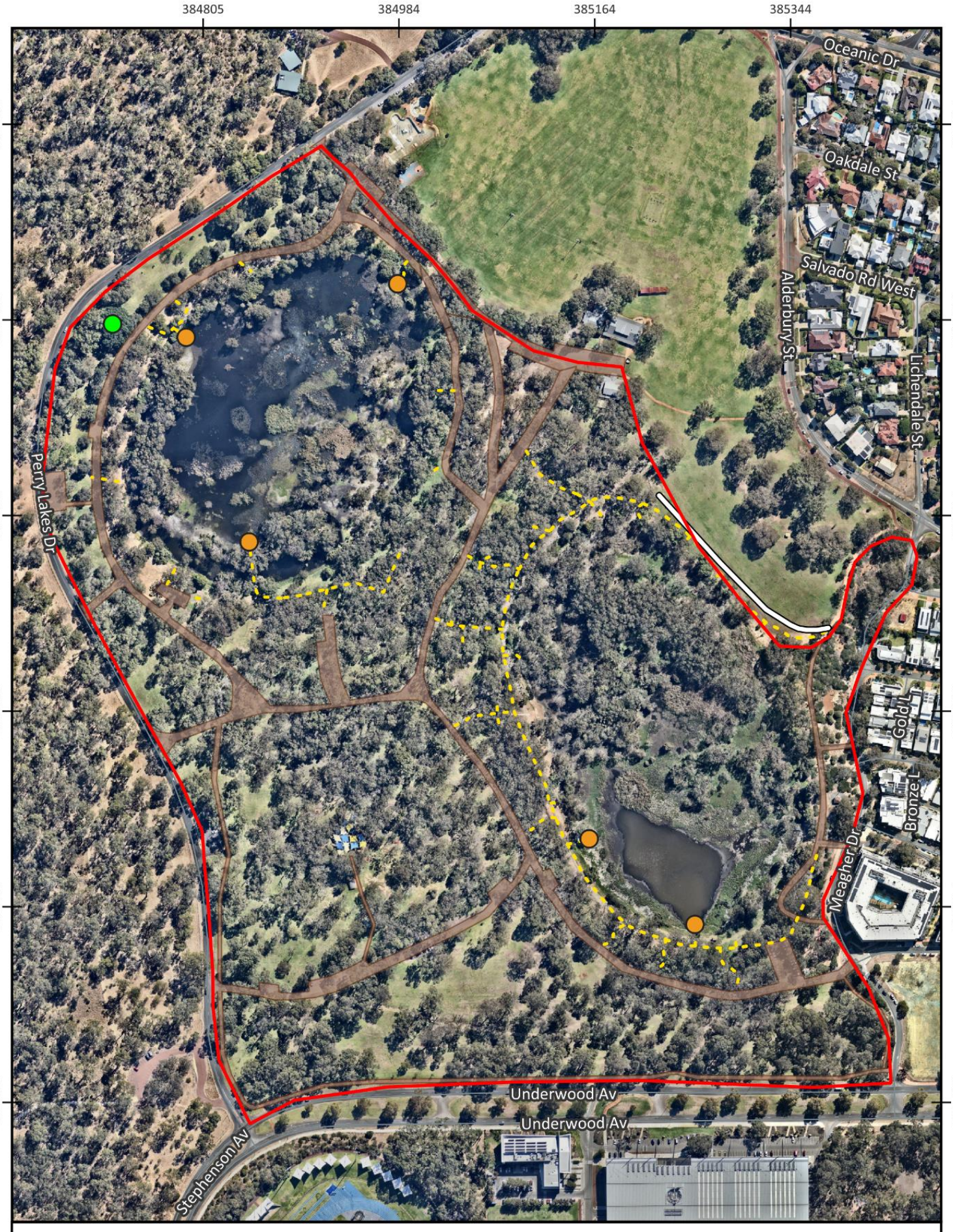


Figure 26:

Proposed Infrastructure
Perry Lakes Reserve

Floreat, Town of Cambridge

Legend

- Site Boundary
- Proposed Infrastructure
  - Bird Hide
  - Nature Playground
- Proposed Fence
- Proposed Paths
- Existing Paths

Client:	Friends of Perry Lakes
Date:	26/07/2024
Created by:	J. Wei
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4496

0 50 100 m

N

8.0 Indicative schedule

The indicative implementation schedule provided in Table 26 and Table 27 is based on best practice timing to undertake various revegetation activities. Initial on-ground works including weed control and plant procurement to commence before planting.

Table 26: Indicative implementation schedule Years 1-2

Year 1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Procurement of seed/plants												
Woody Weed Control												
Seed Collection (if applicable)												
Chemical Weed Control												
Fence installation (If applicable)												
Year 2	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Procurement/ ordering of plants (preceding year)												
Woody Weed Control												
Site Preparation												
Seed Collection (if applicable)												
Ongoing maintenance												
Pre-planting Weed Control												
Planting												
Direct Seeding												
Watering of revegetation (if required)												
Monitoring												

Table 27: Indicative implementation schedule Year 3

Year 3	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Procurement/ ordering of plants (preceding year)												
Woody Weed Control												
Chemical Weed Control & ongoing maintenance												
Planting and infill planting (if required)												
Typha Harvesting (If applicable)												
Watering of revegetation (if required)												
Monitoring												

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Appendix 1: PMST Report 10 km

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 08-Apr-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	71
Listed Migratory Species:	67

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	188
Commonwealth Heritage Places:	6
Listed Marine Species:	100
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	21
Regional Forest Agreements:	None
Nationally Important Wetlands:	3
EPBC Act Referrals:	34
Key Ecological Features (Marine):	2
Biologically Important Areas:	11
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Forrestdale and thomsons lakes	Within 10km of Ramsar site	In buffer area only

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
Commonwealth Marine Areas (EPBC Act)	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Empodisma peatlands of southwestern Australia	Endangered	Community may occur within area	In buffer area only
Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion	Critically Endangered	Community likely to occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In buffer area only
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat known to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tringa nebularia](#)			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
[Xenus cinereus](#)			
Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In buffer area only
[Zanda latirostris listed as Calyptorhynchus latirostris](#)			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
FISH			
[Thunnus maccoyii](#)			
Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
INSECT			
[Hesperocolletes douglasi](#)			
Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
[Balaenoptera musculus](#)			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Bettongia penicillata ogilbyi](#)			
Woylie [66844]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Dasyurus geoffroii](#)			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Eubalaena australis](#)			
Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
[Macroderma gigas](#)			
Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
[Neophoca cinerea](#)			
Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pseudocheirus occidentalis](#) Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
[Andersonia gracilis](#) Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
[Anigozanthos viridis subsp. terraspectans](#) Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Banksia mimica](#) Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In buffer area only
[Caladenia huegelii](#) King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Conospermum undulatum](#) Wavy-leaved Smokebush [24435]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Diuris drummondii](#) Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Diuris micrantha](#) Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Diuris purdiei](#) Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area	In feature area
[Drakaea elastica](#) Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area	In feature area
[Drakaea micrantha](#) Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eremophila glabra subsp. chlorella [84927]	Endangered	Species or species habitat may occur within area	In buffer area only
Eucalyptus argutifolia Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat may occur within area	In feature area
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
SHARK			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharias taurus (west coast population)			
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pristis pristis			
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea amsterdamensis			
Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Hydroprogne caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche carteri			
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata			
Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Carcharhinus longimanus			
Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Eubalaena australis as Balaena glacialis australis](#) Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
[Lamna nasus](#) Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only
[Megaptera novaeangliae](#) Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
[Mobula alfredi as Manta alfredi](#) Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
[Mobula birostris as Manta birostris](#) Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
[Pristis pristis](#) Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Arenaria interpres](#) Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In buffer area only
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area	In buffer area only
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area	In buffer area only
[Calidris tenuirostris](#) Great Knot [862]	Vulnerable	Roosting known to occur within area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In buffer area only
Tringa totanus Common Redshank, Redshank [835]		Roosting known to occur within area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - ARTILLERY BARRACKS - FREMANTLE [50155]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50187]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50186]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50181]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50185]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50184]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50182]	WA	In buffer area only
Defence - CAMPBELL BARRACKS - SWANBOURNE [50183]	WA	In buffer area only
Defence - EAST FREMANTLE SMALL CRAFT BASE [50118]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - HOLDFAST BARRACKS [50214]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50211]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50215]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50210]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50216]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50218]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50219]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50228]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50213]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50212]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50224]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50225]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50217]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50226]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50227]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50220]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50221]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50223]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50222]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50209]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50205]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50206]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50207]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50208]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50204]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50203]	WA	In buffer area only
Defence - HOLDFAST BARRACKS [50202]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - HOLDFAST BARRACKS [50201]	WA	In buffer area only
Defence - IRWIN BARRACKS - KARRAKATTA [50175]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50152]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50153]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50154]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50151]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50150]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50148]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50149]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50147]	WA	In buffer area only
Defence - LEEUWIN BARRACKS - EAST FREMANTLE [50146]	WA	In buffer area only
Defence - PRESTON POINT TRAINING DEPOT [50172]	WA	In buffer area only
Defence - PRESTON POINT TRAINING DEPOT [50174]	WA	In buffer area only
Defence - PRESTON POINT TRAINING DEPOT [50173]	WA	In buffer area only
Defence - SWAN BARRACKS [50171]	WA	In buffer area only
Defence - SWANBOURNE RIFLE RANGE [50191]	WA	In buffer area only
Defence - SWANBOURNE RIFLE RANGE [50190]	WA	In buffer area only
Defence - SWANBOURNE RIFLE RANGE [50189]	WA	In buffer area only
Defence - SWANBOURNE RIFLE RANGE [50188]	WA	In buffer area only
Unknown		
Commonwealth Land - [50715]	WA	In buffer area only
Commonwealth Land - [50768]	WA	In buffer area only
Commonwealth Land - [50769]	WA	In buffer area only
Commonwealth Land - [50772]	WA	In buffer area only
Commonwealth Land - [50766]	WA	In buffer area only
Commonwealth Land - [50773]	WA	In buffer area only
Commonwealth Land - [50767]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51438]	WA	In buffer area only
Commonwealth Land - [50718]	WA	In buffer area only
Commonwealth Land - [50712]	WA	In buffer area only
Commonwealth Land - [51439]	WA	In buffer area only
Commonwealth Land - [50664]	WA	In buffer area only
Commonwealth Land - [50660]	WA	In buffer area only
Commonwealth Land - [50663]	WA	In buffer area only
Commonwealth Land - [50760]	WA	In buffer area only
Commonwealth Land - [50669]	WA	In buffer area only
Commonwealth Land - [50665]	WA	In buffer area only
Commonwealth Land - [50716]	WA	In buffer area only
Commonwealth Land - [50710]	WA	In buffer area only
Commonwealth Land - [50719]	WA	In buffer area only
Commonwealth Land - [51138]	WA	In buffer area only
Commonwealth Land - [50774]	WA	In buffer area only
Commonwealth Land - [51139]	WA	In buffer area only
Commonwealth Land - [50808]	WA	In buffer area only
Commonwealth Land - [51136]	WA	In buffer area only
Commonwealth Land - [50778]	WA	In buffer area only
Commonwealth Land - [51137]	WA	In buffer area only
Commonwealth Land - [50806]	WA	In buffer area only
Commonwealth Land - [50777]	WA	In buffer area only
Commonwealth Land - [50776]	WA	In buffer area only
Commonwealth Land - [50775]	WA	In buffer area only
Commonwealth Land - [50717]	WA	In buffer area only
Commonwealth Land - [50807]	WA	In buffer area only
Commonwealth Land - [51135]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51133]	WA	In buffer area only
Commonwealth Land - [51134]	WA	In buffer area only
Commonwealth Land - [50648]	WA	In buffer area only
Commonwealth Land - [50771]	WA	In buffer area only
Commonwealth Land - [51898]	WA	In buffer area only
Commonwealth Land - [50765]	WA	In buffer area only
Commonwealth Land - [50649]	WA	In buffer area only
Commonwealth Land - [50670]	WA	In buffer area only
Commonwealth Land - [51507]	WA	In buffer area only
Commonwealth Land - [51424]	WA	In buffer area only
Commonwealth Land - [50791]	WA	In buffer area only
Commonwealth Land - [50693]	WA	In buffer area only
Commonwealth Land - [51509]	WA	In buffer area only
Commonwealth Land - [51892]	WA	In buffer area only
Commonwealth Land - [50678]	WA	In buffer area only
Commonwealth Land - [51508]	WA	In buffer area only
Commonwealth Land - [51987]	WA	In buffer area only
Commonwealth Land - [51891]	WA	In buffer area only
Commonwealth Land - [51893]	WA	In buffer area only
Commonwealth Land - [50770]	WA	In buffer area only
Commonwealth Land - [51501]	WA	In buffer area only
Commonwealth Land - [51974]	WA	In buffer area only
Commonwealth Land - [51422]	WA	In buffer area only
Commonwealth Land - [51420]	WA	In buffer area only
Commonwealth Land - [51506]	WA	In buffer area only
Commonwealth Land - [51505]	WA	In buffer area only
Commonwealth Land - [51504]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51503]	WA	In buffer area only
Commonwealth Land - [51502]	WA	In buffer area only
Commonwealth Land - [50690]	WA	In buffer area only
Commonwealth Land - [50748]	WA	In buffer area only
Commonwealth Land - [50691]	WA	In buffer area only
Commonwealth Land - [51437]	WA	In buffer area only
Commonwealth Land - [50692]	WA	In buffer area only
Commonwealth Land - [50709]	WA	In buffer area only
Commonwealth Land - [50714]	WA	In buffer area only
Commonwealth Land - [50707]	WA	In buffer area only
Commonwealth Land - [50783]	WA	In buffer area only
Commonwealth Land - [50676]	WA	In buffer area only
Commonwealth Land - [50677]	WA	In buffer area only
Commonwealth Land - [50675]	WA	In buffer area only
Commonwealth Land - [50746]	WA	In buffer area only
Commonwealth Land - [50742]	WA	In buffer area only
Commonwealth Land - [50743]	WA	In buffer area only
Commonwealth Land - [51413]	WA	In buffer area only
Commonwealth Land - [51414]	WA	In buffer area only
Commonwealth Land - [51415]	WA	In buffer area only
Commonwealth Land - [51416]	WA	In buffer area only
Commonwealth Land - [51417]	WA	In buffer area only
Commonwealth Land - [50738]	WA	In buffer area only
Commonwealth Land - [50739]	WA	In buffer area only
Commonwealth Land - [50730]	WA	In buffer area only
Commonwealth Land - [51981]	WA	In buffer area only
Commonwealth Land - [50647]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51510]	WA	In buffer area only
Commonwealth Land - [51142]	WA	In buffer area only
Commonwealth Land - [50650]	WA	In buffer area only
Commonwealth Land - [51140]	WA	In buffer area only
Commonwealth Land - [51141]	WA	In buffer area only
Commonwealth Land - [50728]	WA	In buffer area only
Commonwealth Land - [50679]	WA	In buffer area only
Commonwealth Land - [50726]	WA	In buffer area only
Commonwealth Land - [50724]	WA	In buffer area only
Commonwealth Land - [50727]	WA	In buffer area only
Commonwealth Land - [50720]	WA	In buffer area only
Commonwealth Land - [50721]	WA	In buffer area only
Commonwealth Land - [50723]	WA	In buffer area only
Commonwealth Land - [51145]	WA	In buffer area only
Commonwealth Land - [50673]	WA	In buffer area only
Commonwealth Land - [51418]	WA	In buffer area only
Commonwealth Land - [51419]	WA	In buffer area only
Commonwealth Land - [51411]	WA	In buffer area only
Commonwealth Land - [51127]	WA	In buffer area only
Commonwealth Land - [51129]	WA	In buffer area only
Commonwealth Land - [51904]	WA	In buffer area only
Commonwealth Land - [51902]	WA	In buffer area only
Commonwealth Land - [51903]	WA	In buffer area only
Commonwealth Land - [51423]	WA	In buffer area only
Commonwealth Land - [51124]	WA	In feature area
Commonwealth Land - [50695]	WA	In buffer area only
Commonwealth Land - [50694]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50697]	WA	In buffer area only
Commonwealth Land - [50696]	WA	In buffer area only
Commonwealth Land - [50699]	WA	In buffer area only
Commonwealth Land - [50698]	WA	In buffer area only
Commonwealth Land - [51119]	WA	In buffer area only
Commonwealth Land - [51122]	WA	In buffer area only
Commonwealth Land - [50752]	WA	In buffer area only
Commonwealth Land - [50757]	WA	In buffer area only
Commonwealth Land - [50641]	WA	In buffer area only
Commonwealth Land - [51498]	WA	In buffer area only
Commonwealth Land - [51494]	WA	In buffer area only
Commonwealth Land - [51157]	WA	In buffer area only
Commonwealth Land - [50750]	WA	In buffer area only
Commonwealth Land - [50685]	WA	In buffer area only
Commonwealth Land - [50753]	WA	In buffer area only
Commonwealth Land - [50759]	WA	In buffer area only
Commonwealth Land - [50687]	WA	In buffer area only
Commonwealth Land - [50758]	WA	In buffer area only

Commonwealth Heritage Places			[Resource Information]
Name	State	Status	Buffer Status
Historic			
Army Magazine Buildings Irwin Barracks	WA	Listed place	In buffer area only
Artillery Barracks	WA	Listed place	In buffer area only
Claremont Post Office	WA	Listed place	In buffer area only
Inglewood Post Office	WA	Listed place	In buffer area only
Perth General Post Office	WA	Listed place	In buffer area only
South Perth Post Office	WA	Listed place	In buffer area only

Listed Marine Species	[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In buffer area only
[Calidris tenuirostris](#) Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In buffer area only
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius mongolus](#) Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
[Charadrius ruficapillus](#) Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In buffer area only
[Diomedea amsterdamensis](#) Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
[Gallinago megala](#) Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
[Gallinago stenura](#) Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
[Halobaena caerulea](#) Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Himantopus himantopus](#) Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In buffer area only
[Hydroprogne caspia as Sterna caspia](#) Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Larus pacificus](#) Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area	In buffer area only
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
[Limosa limosa](#) Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area	In buffer area only
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In buffer area only
Tringa totanus Common Redshank, Redshank [835]		Roosting known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
Fish			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In buffer area only
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area	In buffer area only
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area	In buffer area only
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area	In buffer area only
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In buffer area only
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In buffer area only
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area	In buffer area only
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In buffer area only
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In buffer area only
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area	In buffer area only
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In buffer area only
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In buffer area only
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Urocampus carinirostris](#) Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
[Vanacampus margaritifer](#) Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
[Vanacampus phillipi](#) Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In buffer area only
[Vanacampus poecilolaemus](#) Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In buffer area only
Mammal			
[Arctocephalus forsteri](#) Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Reptile			
[Aipysurus pooleorum](#) Shark Bay Sea Snake [66061]		Species or species habitat may occur within area	In buffer area only
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hydrophis kingii as Disteira kingii			
Spectacled Sea Snake [93511]		Species or species habitat may occur within area	In buffer area only
Hydrophis platura as Pelamis platurus			
Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In buffer area only
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata			
Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata			
Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Delphinus delphis			
Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis			
Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Grampus griseus			
Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Alfred Cove	Nature Reserve	WA	In buffer area only
Bold Park	Botanic Gardens	WA	In feature area
Canning River	Management Area	WA	In buffer area only
Cottesloe Reef	Fish Habitat Protection Area	WA	In buffer area only
Keanes Point Reserve	5(1)(g) Reserve	WA	In buffer area only
Kings Park	Botanic Gardens	WA	In buffer area only
Marmion	Marine Park	WA	In buffer area only
Matilda Bay Reserve	5(1)(g) Reserve	WA	In buffer area only
Milyu	Nature Reserve	WA	In buffer area only
Perth Zoo	Other	WA	In buffer area only
Swan Estuary	Marine Park	WA	In buffer area only
Swan Estuary - Alfred Cove	Marine Park	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Swan Estuary - Milyu	Marine Park	WA	In buffer area only
Swan Estuary - Pelican Point	Marine Park	WA	In buffer area only
Swan River	Management Area	WA	In buffer area only
Unnamed WA31906	Nature Reserve	WA	In buffer area only
Unnamed WA44414	5(1)(g) Reserve	WA	In buffer area only
Unnamed WA45772	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA45773	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA50067	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA52237	5(1)(h) Reserve	WA	In buffer area only

Nationally Important Wetlands

[Resource Information]

Wetland Name	State	Buffer Status
Herdsman Lake	WA	In buffer area only
Palmer Barracks, Guildford	WA	In buffer area only
Swan-Canning Estuary	WA	In buffer area only

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Hale School Development	2022/09273		Assessment	In buffer area only
Controlled action				
Erindale Road Development, Hamersley, WA	2018/8324	Controlled Action	Further Information Request	In buffer area only
Nava-1 Cable System	2001/510	Controlled Action	Completed	In buffer area only
Residential Development at Shenton Park	2007/3386	Controlled Action	Completed	In buffer area only
Shark Hazard Mitigation Drum Line Program, WA	2014/7174	Controlled Action	Completed	In buffer area only
Shenton Park Subdivision	2004/1479	Controlled Action	Completed	In feature area
Not controlled action				
APX-West Fibre-optic telecommunications cable system, WA to Singapore	2013/7102	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Bold Park St John's Wood Mt Claremont residential development,Claremont WA	2014/7248	Not Controlled Action	Completed	In buffer area only
Construction of the Perth Stadium and associated infrastructure	2013/6740	Not Controlled Action	Completed	In buffer area only
Cottesloe Golf Course safety improvements, Swanbourne, WA	2019/8423	Not Controlled Action	Completed	In buffer area only
Development Application 20 Kenhelm St Balcatta WA	2021/9037	Not Controlled Action	Completed	In buffer area only
Development of a Diagnostic Laboratory	2011/6089	Not Controlled Action	Completed	In buffer area only
Development of Existing Lots 9970 & 10754, Bedbrook Pl, Shenton Park, WA	2013/7033	Not Controlled Action	Completed	In buffer area only
Disposal of residential properties, Fremantle, WA	2019/8593	Not Controlled Action	Completed	In buffer area only
Fremantle Ports Inner Harbour Capital Dredging Proposal	2005/2477	Not Controlled Action	Completed	In buffer area only
GPO Building, 3 Forrest Place, Perth WA 6000	2017/8014	Not Controlled Action	Completed	In buffer area only
High Street Upgrade, Fremantle, WA	2018/8315	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Oman Australia Cable Installation, WA	2021/8922	Not Controlled Action	Completed	In buffer area only
Oman Australia Cable - Marine Route Survey	2020/8731	Not Controlled Action	Completed	In buffer area only
Reid Highway duplication project(Erindale Rd - Duffy Rd)WA	2013/7073	Not Controlled Action	Completed	In buffer area only
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed	In buffer area only
Shenton Park Rehabilitation Hospital Redevelopment, Shenton Park, WA	2015/7622	Not Controlled Action	Completed	In buffer area only
Shenton Park Zone Substation Conversion and Expansion	2012/6354	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Urban Development Project, Lot 55 and 56 Cottonwood Crescent, Dianella, WA	2017/8031	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Australia to Singapore Fibre Optic Submarine Cable System	2011/6127	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
City of Cockburn Sporting Facilties	2005/2139	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Laying a submarine optical fibre telecommunications cable, Perth to Singapore and Jakarta	2014/7332	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Perth GPO alteration and refurbishment	2007/3318	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Sale of ABC Sound Broadcasting and Television Studios	2008/3951	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
South West Metropolitan Railway Project	2003/1175	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
GPO Building, 3 Forrest Place, Perth WA 6000	2017/7988	Referral Decision	Completed	In buffer area only

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region	Buffer Status
Commonwealth marine environment within and adjacent to the west coast inshore lagoons	South-west	In buffer area only
Western rock lobster	South-west	In buffer area only

Biologically Important Areas			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur	In buffer area only
Eudyptula minor Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In buffer area only
Hydroprogne caspia Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In buffer area only
Larus pacificus Pacific Gull [811]	Foraging (in high numbers)	Former Range	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only
Sterna dougallii Roseate Tern [817]	Foraging	Known to occur	In feature area
Sternula nereis Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In buffer area only
Seals			
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Likely to occur	In buffer area only
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur	In buffer area only
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix 2: Conservation Codes

Western Australia

Conservation Code	Name	Description
T	Threatened	Flora or fauna that is rare or likely to become extinct, ranked according to their level of threat using IUCN Red List criteria (Schedules 1-3 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
CR	Critically endangered	Species considered to be facing an extremely high risk of extinction within the wild in the immediate future
EN	Endangered	Species considered to be facing a very high risk of extinction in the wild in the near future
VU	Vulnerable	Species considered to be facing a high risk of extinction in the wild in the medium-term future
EX	Extinct Species	Species where 'there is no reasonable doubt that the last member of the species has died (Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
EW	Extinct in the Wild	Species that are known to only survive in cultivation, in captivity, or as a naturalised population well outside its past range; and it has not been recorded in its known or expected habitat at appropriate seasons anywhere in its past range, despite surveys over a timeframe appropriate to its life cycle and form
MI	Migratory Species	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth (Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice)
CD	Conservation Dependent	Species of special conservation interest (conservation dependent fauna), being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened (Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice)
OS	Specially Protected	Fauna otherwise in need of special protection to ensure their conservation (Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice)
P	Priority Species	Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or

Conservation Code	Name	Description
		flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.
P1	Priority One	Poorly known species – Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either very small or on lands not managed for conservation, such as road verges, urban areas, farmland, active mineral lease and under threat of habitat destruction or degradation.
2	Priority Two	Poorly known species – Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, such as national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves and similar.
3	Priority Three	Poorly known species – Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat
4	Priority Four	Rare or near threatened and other species in need of monitoring.

(Source: Department of Biodiversity, Conservation and Attractions, 2020)

Commonwealth

Category	Description
Critically Endangered	Species facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Species facing a very high risk of extinction in the wild in the near future
Vulnerable	Species facing a high risk of extinction in the wild in the medium term

(Source: Department of Biodiversity, Conservation and Attractions, 2019)

Appendix 3: Flora Species List

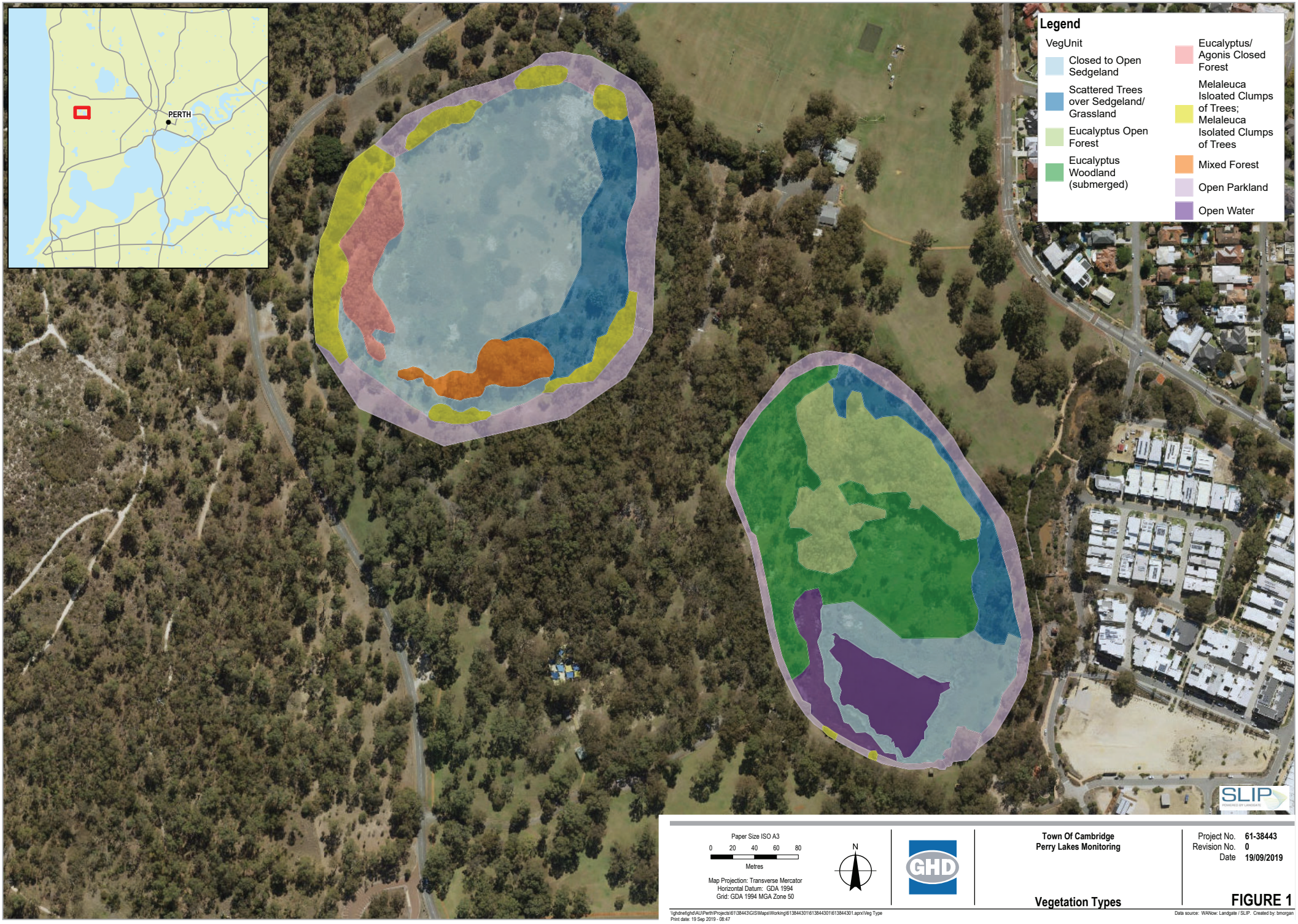
Family	Species	Status	Flowering Times
Aizoaceae	*Carpobrotus edulis*	*	
Aizoaceae	*Tetragonia decumbens*	*	
Anacardiaceae	*Schinus terebinthifolia*	*	
Apocynaceae	*Gomphocarpus fruticosus*	*dp	
Araliaceae	*Hydrocotyle bonariensis*	*	
Arecaceae	*Livistona eastonii*	*	
Arecaceae	*Washingtonia filifera*	*	
Asparagaceae	*Asparagus asparagoides*	*dp	
Asphodelaceae	*Trachyandra divaricata*	*	
Asteraceae	*Cirsium vulgare*	*	
Asteraceae	*Dittrichia graveolens*	*	
Asteraceae	*Erigeron canadensis*	*	
Asteraceae	*Erigeron sumatrensis*	*	
Asteraceae	*Hypochaeris radicata*	*	
Asteraceae	*Lactuca saligna*	*	
Asteraceae	*Lactuca serriola*	*	
Asteraceae	*Olearia axillaris*		Nov - Jul
Asteraceae	*Sonchus asper*	*	
Asteraceae	*Sonchus oleraceus*	*	
Asteraceae	*Symphyotrichum squamatum*	*	
Caesalpinioides	*Ceratonia siliqua*	*	
Campanulaceae	*Lobelia anceps*		Sep - May
Casuarinaceae	*Casuarina obesa*		Jan – Dec
Chenopodiaceae	*Atriplex prostrata*	*	
Chenopodiaceae	*Rhagodia baccata*		Feb – Apr or Oct – Dec
Cupressaceae	*Callitris preissii*		Oct – Jan
Cupressaceae	*Taxodium distichum*	*	
Cyperaceae	*Bolboschoenus caldwellii*		Aug - Mar
Cyperaceae	*Cyperus congestus*	*	
Cyperaceae	*Cyperus polystachyos*	*	

Family	Species	Status	Flowering Times
Cyperaceae	*Cyperus tenuiflorus*	*	
Cyperaceae	*Ficinia nodosa*		Oct - Jan
Cyperaceae	*Lepidosperma gladiatum*		Nov – Dec or Jan - May
Cyperaceae	*Lepidosperma longitudinale*		May – Jun or Aug - Oct
Cyperaceae	*Machaerina articulata*		Jan - Dec
Cyperaceae	*Machaerina juncea*		Oct - Dec or Jan - Mar
Cyperaceae	*Schoenoplectus tabernaemontani*		Oct - Dec or Jan - Feb
Euphorbiaceae	*Euphorbia maculata*	*	
Euphorbiaceae	*Euphorbia peplus*	*	
Euphorbiaceae	*Euphorbia terracina*	*	
Euphorbiaceae	*Ricinus communis*	*	
Fabaceae	*Acacia cyclops*		Sep - Jan
Fabaceae	*Acacia lasiocarpa*		May - Oct
Fabaceae	*Acacia longifolia*	*	
Fabaceae	*Acacia pulchella*		May - Dec
Fabaceae	*Acacia rostellifera*		Jul - Dec
Fabaceae	*Acacia xanthina*		Aug - Oct
Fabaceae	*Gompholobium tomentosum*		Jul - Jan
Fabaceae	*Hardenbergia comptoniana*		Jul – Oct
Fabaceae	*Kennedia prostrata*		Apr – Nov
Fabaceae	*Lathyrus tingitanus*	*	
Fabaceae	*Medicago polymorpha*	*	
Fabaceae	*Melilotus indicus*	*	
Fabaceae	*Templetonia retusa*		Apr – Nov
Fabaceae	*Vicia sativa*	*	
Fumariaceae	*Fumaria capreolata*	*	
Geraniaceae	*Pelargonium capitatum*	*	
Goodeniaceae	*Lechenaultia linarioides*		Jan - Dec
Goodeniaceae	*Scaevola crassifolia*		Jul – Jan
Haemodoraceae	*Anigozanthos manglesii*		Aug - Nov
Haemodoraceae	*Conostylis candicans*		Jul - Nov
Hemerocallidaceae	*Dianella revoluta*		Aug – Dec or Jan - Apr

Family	Species	Status	Flowering Times
Iridaceae	*Patersonia occidentalis*		Aug – Jan
Juncaceae	*Juncus pallidus*		Oct – Dec
Lamiaceae	*Hemiandra glabra*		Sep - Nov
Malvaceae	*Brachychiton sp.*	*	
Malvaceae	*Lagunaria patersonia*	*	
Malvaceae	*Malva parviflora*	*	
Meliaceae	*Melia azedarach*	*	
Myrtaceae	*Agonis flexuosa*		Jul – Dec
Myrtaceae	*Calothamnus quadrifidus*		Jun - Dec
Myrtaceae	*Calothamnus rupestris*		Jul – Dec
Myrtaceae	*Corymbia calophylla*		Dec – May
Myrtaceae	*Eucalyptus botryoides*	*	
Myrtaceae	*Eucalyptus camaldulensis*	*	
Myrtaceae	*Eucalyptus cladocalyx*	*	
Myrtaceae	*Eucalyptus globulus*	*	
Myrtaceae	*Eucalyptus gomphocephala*		Jan - Apr
Myrtaceae	*Eucalyptus rudis*		Jul – Sep
Myrtaceae	*Kunzea glabrescens*		Oct – Nov
Myrtaceae	*Melaleuca armillaris*	*	
Myrtaceae	*Melaleuca citrina*	*	
Myrtaceae	*Melaleuca cuticularis*		Aug – Nov
Myrtaceae	*Melaleuca huegelii*		Sep – Jan
Myrtaceae	*Melaleuca incana*		May - Nov
Myrtaceae	*Melaleuca linariifolia*	*	
Myrtaceae	*Melaleuca nesophila*	*	
Myrtaceae	*Melaleuca preissiana*		Nov – Feb
Myrtaceae	*Melaleuca quinquenervia*	*	
Myrtaceae	*Melaleuca rhaphiophylla*		Jul – Jan
Myrtaceae	*Melaleuca systena*		Feb – Mar or Aug – Dec
Myrtaceae	*Melaleuca viminea*		Jul – Nov
Myrtaceae	*Verticordia lindleyi*		May or Nov – Feb
Oleaceae	*Olea europaea*	*	

Family	Species	Status	Flowering Times
Onagraceae	*Oenothera laciniata*	*	
Oxalidaceae	*Oxalis pes-caprae*	*	
Phytolaccaceae	*Phytolacca octandra*	*	
Pinaceae	*Pinus radiata*	*	
Plantaginaceae	*Bacopa monnieri*	*	
Poaceae	*Austrostipa elegantissima*		Aug – Jan
Poaceae	*Avena barbata*	*	
Poaceae	*Cenchrus clandestinus*	*	
Poaceae	*Cynodon dactylon*	*	
Poaceae	*Ehrharta calycina*	*	
Poaceae	*Lagurus ovatus*	*	
Poaceae	*Paspalum urvillei*	*	
Poaceae	*Poa annua*	*	
Polygonaceae	*Persicaria lapathifolia*	*	
Polygonaceae	*Rumex acetosella*	*	
Primulaceae	*Lysimachia arvensis*	*	
Proteaceae	*Banksia attenuata*		Dec – Feb
Proteaceae	*Banksia littoralis*		Mar – Aug
Proteaceae	*Banksia menziesii*		Feb – Oct
Proteaceae	*Banksia sessilis*		Apr – Nov
Proteaceae	*Grevillea crithmifolia*		Jun - Nov
Salicaceae	*Salix babylonica*	*	
Scrophulariaceae	*Eremophila glabra*		Mar – Dec
Solanaceae	*Solanum nigrum*	*	
Tropaeolaceae	*Tropaeolum majus*	*	
Typhaceae	*Typha orientalis*	nat	
Verbenaceae	*Phyla nodiflora*	*	
Zamiaceae	*Macrozamia riedlei*		Sep – Oct

Appendix 4: Mapped Vegetation Types (GHD, 2019)



Paper Size ISO A3

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Town Of Cambridge
Perry Lakes Monitoring

Vegetation Types

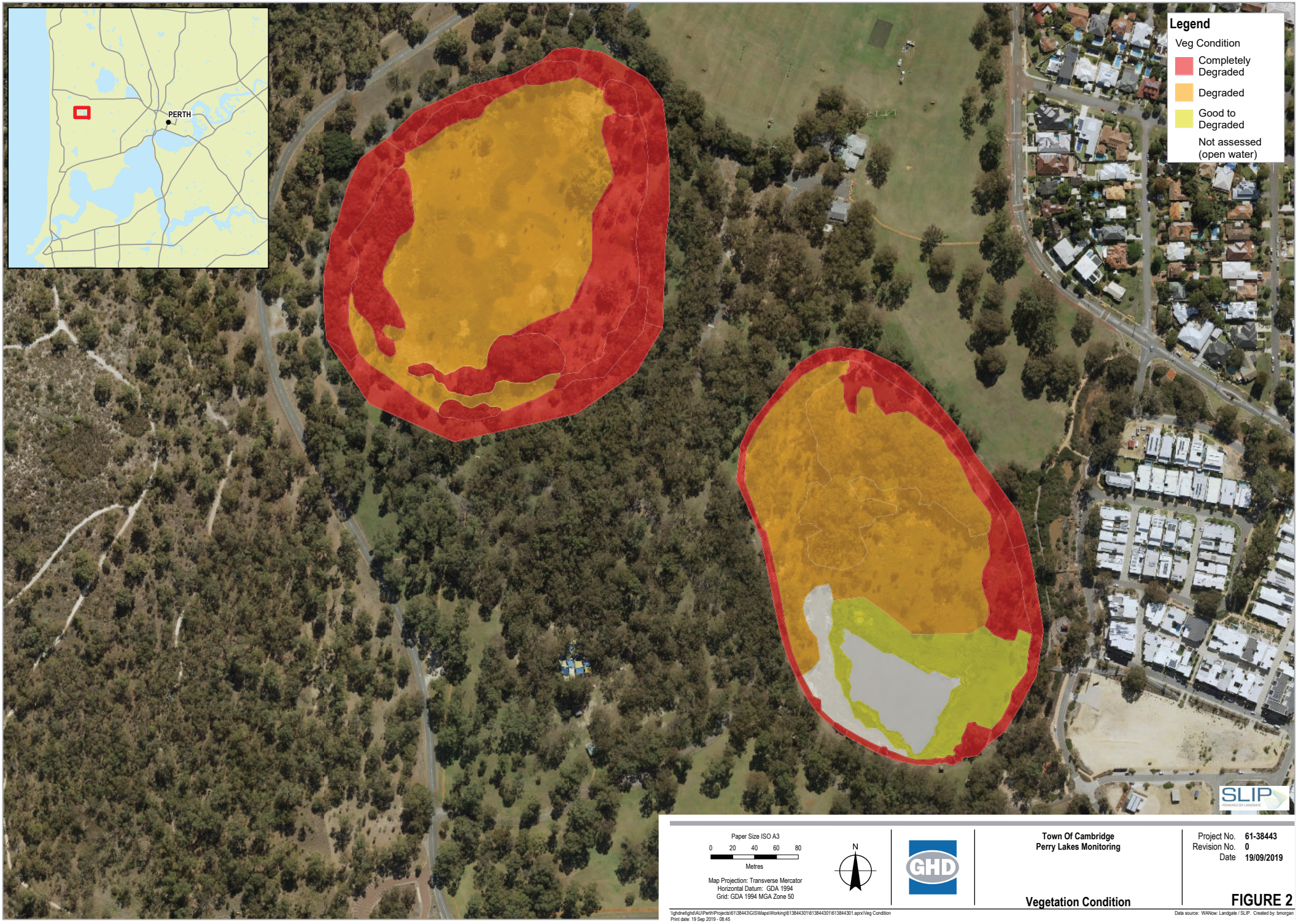
Project No. **61-38443**
Revision No. **0**
Date **19/09/2019**

FIGURE 1

\\ghdnetghd\AU\Perth\Projects\61\38443\GIS\Maps\Working\61384301\61384301\61384301.aprx\Veg Type
Print date: 19 Sep 2019 - 08:47

Data source: WANow: Landgate / SLIP. Created by: bmorgan

Appendix 5: Mapped Vegetation Condition (GHD, 2019)



Paper Size ISO A3

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Town Of Cambridge
Perry Lakes Monitoring

Vegetation Condition

Project No. 61-38443
Revision No. 0
Date 19/09/2019

FIGURE 2

\\ghdnetghd\AU\Perth\Projects\61\38443\GIS\Maps\Working\61\38443301\61\38443301\61\38443301.aprx\Veg Condition
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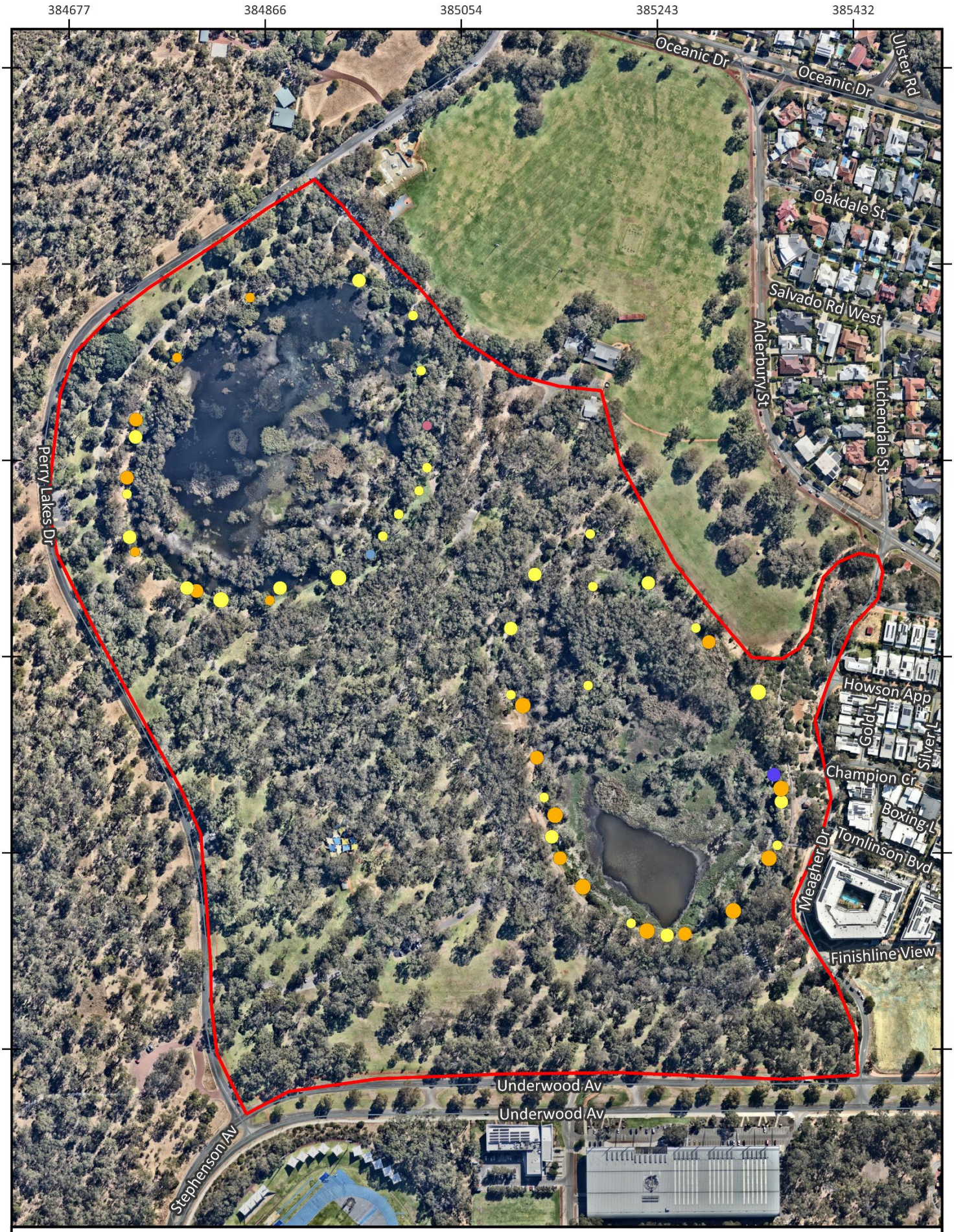
Data source: WANow: Landgate / SLIP. Created by: bmorgan

Appendix 6: Weed Maps



Map 1:
Grass Weeds

Legend

- Site Boundary

Weed Species

- Cenchrus clandestinus <5
- Cenchrus clandestinus >75
- Cenchrus clandestinus 6-75%
- Cynodon dactylon <5
- Cynodon dactylon >75
- Cynodon dactylon 6-75%
- Ehrharta calycina <5
- Paspalum urvillei 6-75%
- Poa annua <5

Client: Friends of Parry Lakes
Date: 19/08/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4720

0 50 100 m

N

Perry Lakes Reserve Town of Cambridge

Map 2:
Woody Weeds

Legend

Site Boundary

Weed Species

- Livistona eastonii <5
- Melaleuca nesophila 6-75%
- Melaleuca quinquenervia <5
- Olea europaea <5
- Schinus terebinthifolia <5
- Schinus terebinthifolia 6-75%

Client: Friends of Parry Lakes
Date: 13/08/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4720

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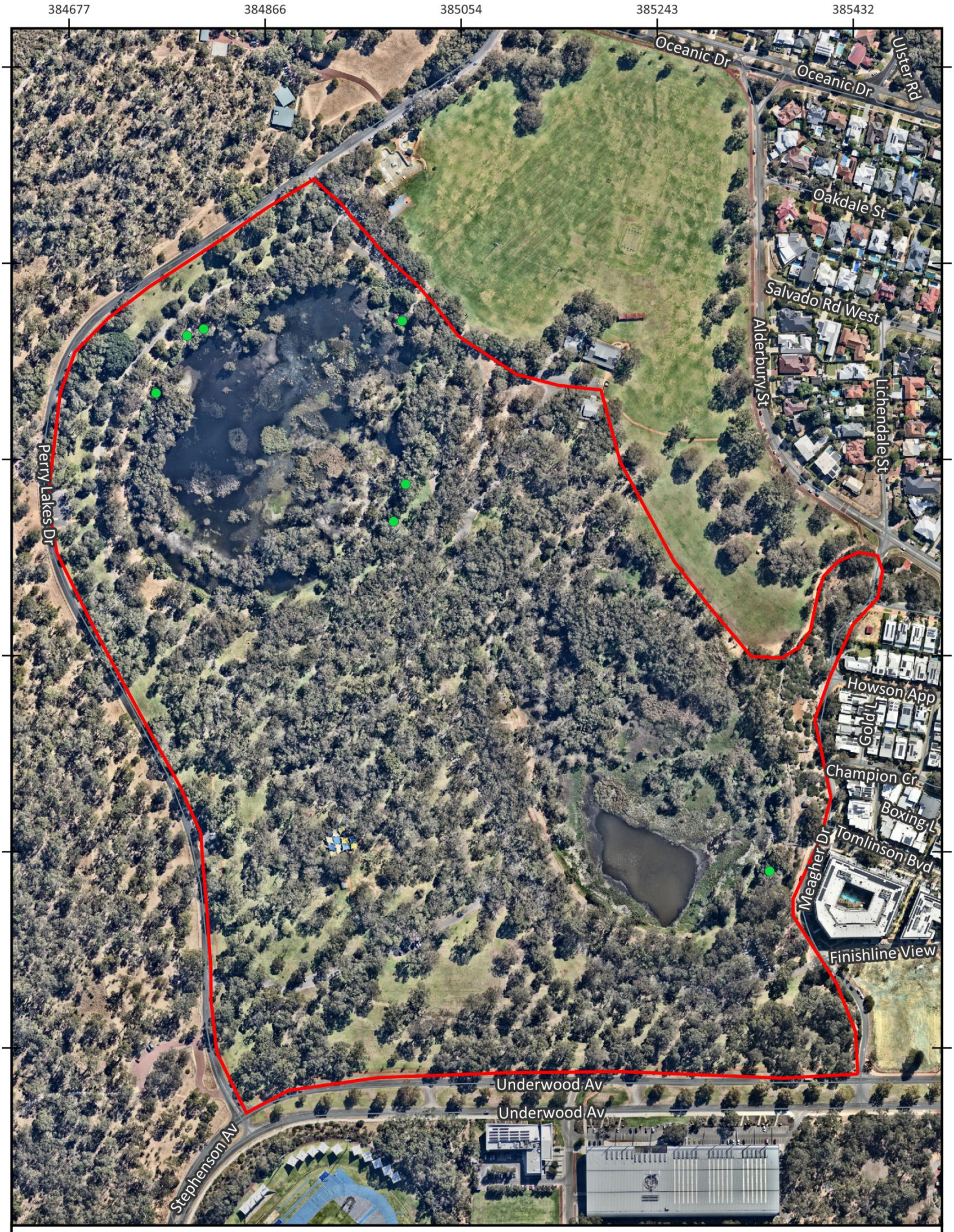
N

Perry Lakes Reserve Town of Cambridge



Map 3:
Declared Pests

Legend

Site Boundary

Weed Species

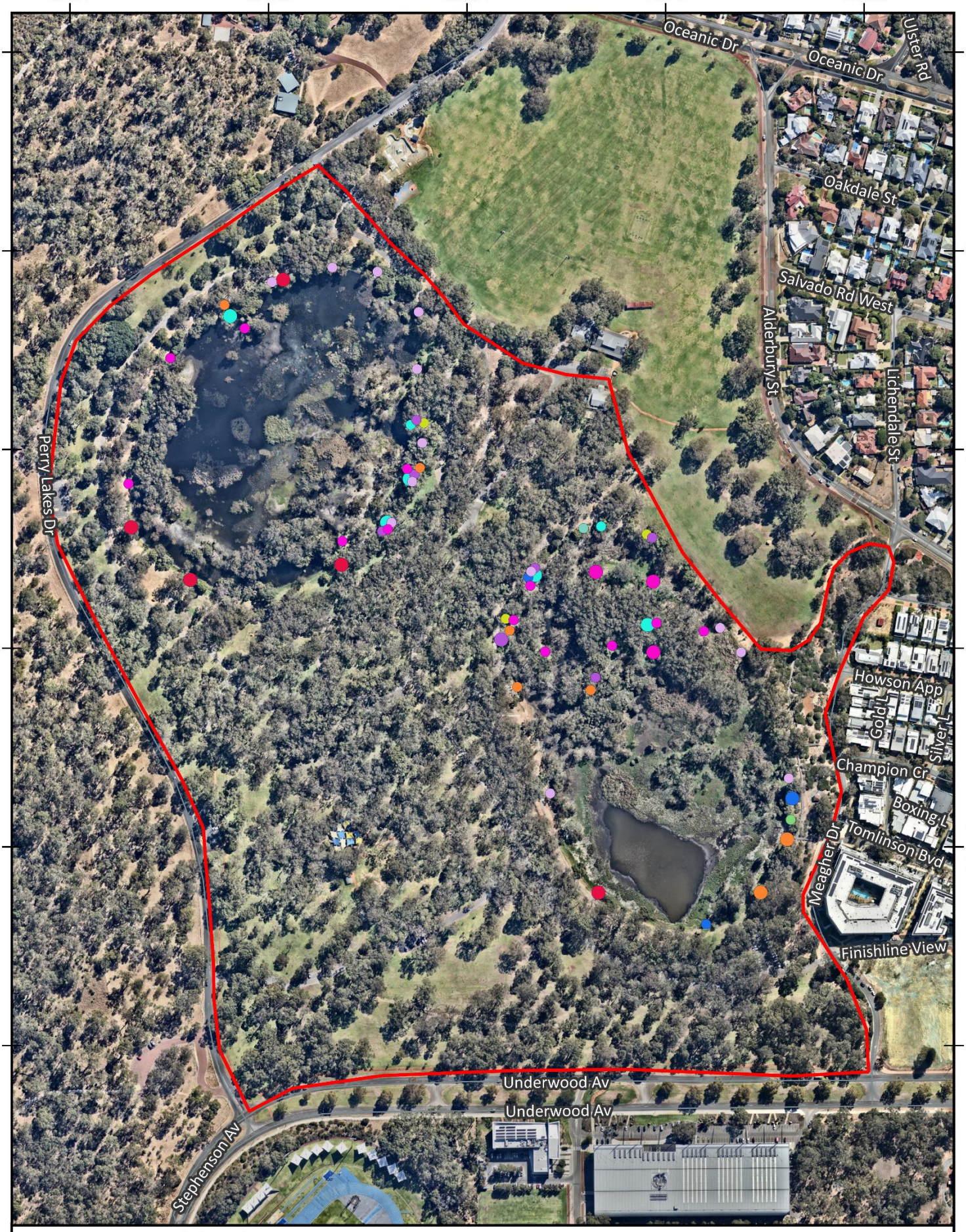
Gomphocarpus fruticosus <5

Client:	Friends of Parry Lakes
Date:	13/08/2024
Created by:	K.Evans
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4720

0 50 100 m

N

Perry Lakes Reserve Town of Cambridge



Map 4:
High Priority Weeds

Legend

Weed Species

- Bacopa monnieri <5
- Bacopa monnieri 6-75%
- Carpobrotus edulis <5
- Euphorbia terracina <5
- Euphorbia terracina 6-75%
- Hydrocotyle bonariensis <5
- Hydrocotyle bonariensis 6-75%
- Hypochaeris radicata <5
- Lactuca saligna <5
- Lactuca saligna 6-75%
- Lactuca serriola <5
- Pelargonium capitatum <5
- Pelargonium capitatum 6-75%
- Phyla nodiflora <5
- Phyla nodiflora 6-75%
- Tetragonia decumbens <5

Client: Friends of Parry Lakes
Date: 19/08/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4720

0 50 100 m

N

Perry Lakes Reserve Town of Cambridge

Map 5: Medium Priority Weeds

Legend

- Site Boundary

Weed Species

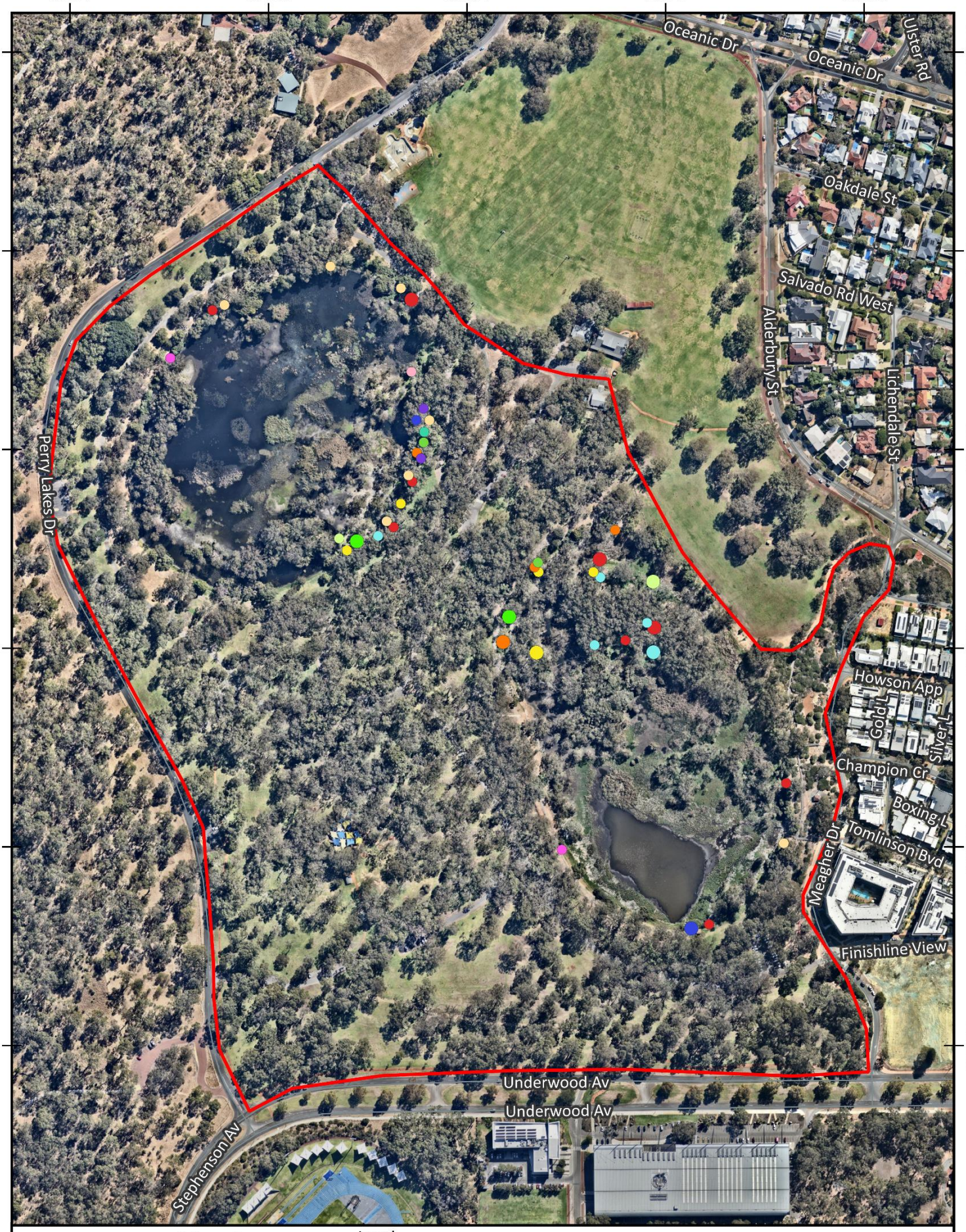
- Dittrichia graveolens <5
- Dittrichia graveolens 6-75%
- Erigeron sumatrensis <5
- Erigeron sumatrensis 6-75%
- Ricinus communis <5
- Solanum nigrum <5
- Solanum nigrum 6-75%
- Symphyotrichum squamatum <5
- Symphyotrichum squamatum 6-75%
- Trachyandra divaricata <5

Client: Friends of Parry Lakes
Date: 19/08/2024
Created by: K.Evans
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 4720

0 50 100 m

N

Perry Lakes Reserve Town of Cambridge



Map 6:
Low Priority Weeds

Perry Lakes Reserve
Town of Cambridge

Legend

Weed Species

- Atriplex prostrata <5
- Atriplex prostrata 6-75%
- Cirsium vulgare <5
- Cirsium vulgare 6-75%
- Cyperus congestus <5
- Cyperus congestus 6-75%
- Cyperus tenuiflorus <5
- Cyperus tenuiflorus 6-75%
- Erigeron canadensis <5
- Erigeron canadensis 6-75%
- Euphorbia peplus <5
- Lysimachia arvensis <5
- Lysimachia arvensis 6-75%
- Malva parviflora <5
- Medicago polymorpha <5
- Melilotus indicus <5
- Rumex acetosella <5
- Rumex acetosella 6-75%
- Sonchus asper <5
- Sonchus oleraceus <5

Client:	Friends of Parry Lakes
Date:	19/08/2024
Created by:	K.Evans
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4720

0 50 100 m

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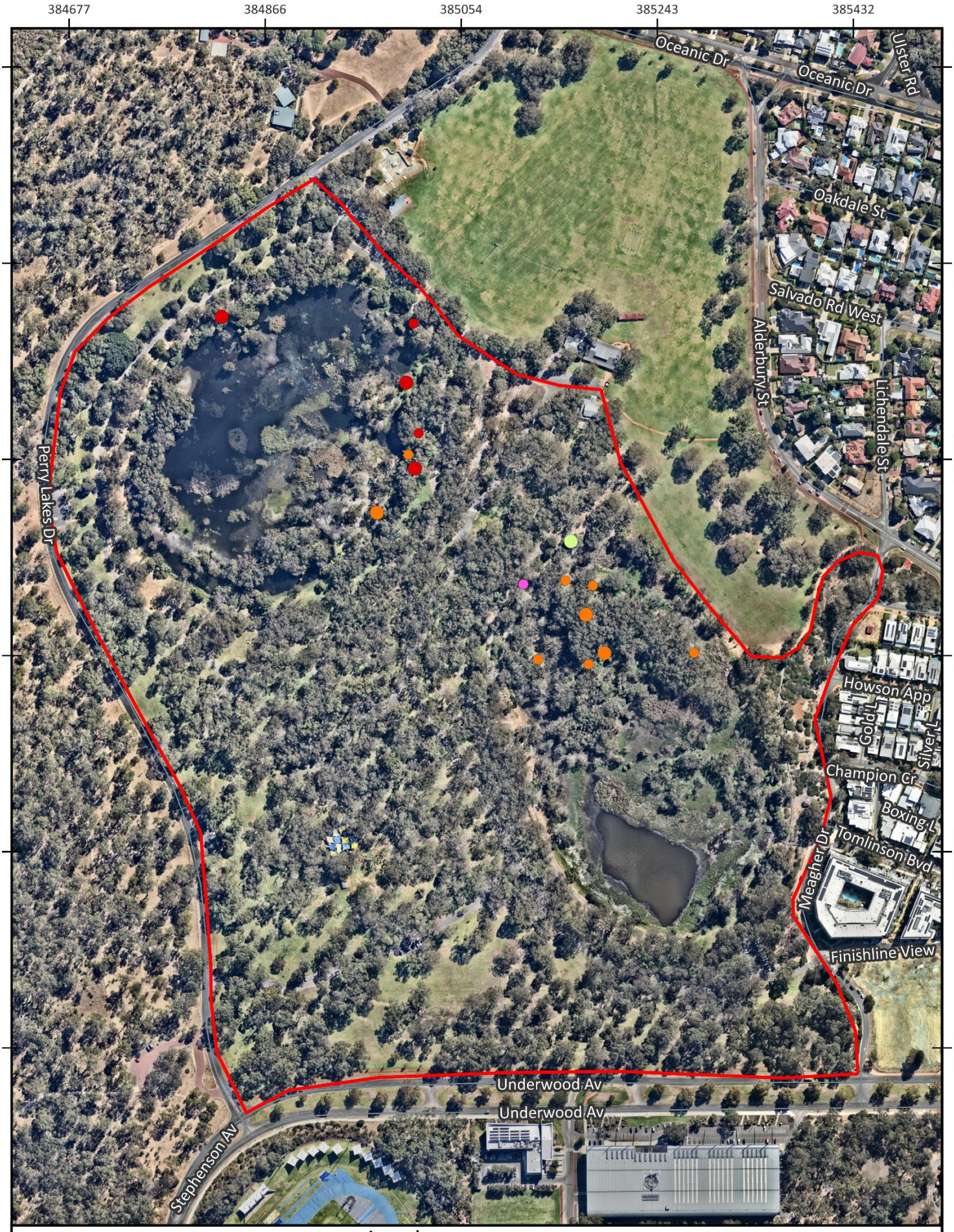

Map 7:
Other Weeds

Perry Lakes Reserve, Town of Cambridge

Legend

Site Boundary

Weed Species

- Euphorbia maculata <5
- Euphorbia maculata 6-75%
- Lagunaria patersonia <5
- Lagunaria patersonia 6-75%
- Oenothera laciniata <5
- Taxodium distichum 6-75%

Client:	Friends of Parry Lakes
Date:	19/08/2024
Created by:	K.Evans
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 4720

0 50 100 m

N

Appendix 7: Example Hollow Monitoring and Inspection Form

Inspection Date:		**Inspection Time:**			
Hollow ID:					
Tree and Site Details Species, DBH, condition (i.e. poor, previously burnt, recent damage), Bamford Class	**Species**	**DBH (mm)**	**Habitat Tree condition**	**Bamford Class:**	**Fuel load/fire risk:**
Angle of Hollow Entry					
Evidence of chewing **Absent, present, chewing post etc**					
Feeding signs/ feeding debris **E.g. chewed nuts, banksia cones**					
Signs of hollow use **E.g. feathers, droppings, cobwebs, tapping to see if female will flush from hollow (best undertaken between 10am and 3pm when females most likely to be sitting)**					
Determine use by any species. **Inspection from ground or using pole mounted camera** **Details of any species observed**					
Pest species **Details of any insect or pest species activity observed**					
Hollow Functionality **Is the hollow functioning and present on the habitat tree**					
Any other issues noted					
Photographic evidence Photos to be date stamped	**Photo description**	**Photo taken. (Yes / No)**	**Photo reference / file name**	**Comments**	
	Photo taken from the ground (entire tree)				
	Close-up photo of the ANH				
	Photo of the inside of ANH				
	Photo of any fauna species observed on each habitat tree containing an ANH				

Appendix 8: Example Monitoring Recording Sheets

General Site Information

Site:	
Date:	
Assessors:	
Weather Conditions:	

Fauna sighted (list)

Maintenance issues present?
Describe

Potential success inhibiting factors present?
Describe

General Comments

Photo Monitoring

Photo Point	Location description	GPS location	Photo ID

Quadrat Monitoring

Site:	**Quadrat No:**
Date:	**Photo ID:**
Location Description:	**GPS:**
Native Vegetation	**Weeds**
Health (Rate 1-5; 1=Poor):	**Health (Rate 1-5; 1=Poor):**
Native Abundance (% Cover):	**Weed Abundance (% Cover):**
% Survival:	
Comments/Recommendations:	

Native Species Present		**Weed Species Present**	
Species	**No:**	**Species**	**No:**
Total:		**Total:**	
Species Diversity:		**Species Diversity:**	