Booragoon Lake

Strategic Management Plan
2024-2029

City of
Melville

Executive Summary

Strategic reserve plans are required to be developed for selected reserves and periodically updated according to the guidance provided in the City of Melville's Natural Areas Asset Management Plan. The assets and threats identified within the reserve outlined assist in determining the success and projection of the reserve, allowing the prioritisation of management techniques within the reserves. The Strategic Management Plans have been developed in 2004, 2012, and 2018.

Assets present within Booragoon Lake Reserve were identified and determine how the City is performing in relation to measurable indices outlined in the City's Natural Areas Asset Management Plan (NAAMP). Assets identified in Booragoon Lake include:

- a classified Conservation Category Wetland
- bush forever site (ID 337)
- forms part of the High Value Strategic Greenway (Greenway 95)
- contains four different vegetation types:
- contains a priority two ecological community, wooded wetlands that supports colonial waterbird nesting areas
- vegetation condition ranges from very good to degraded
- a total of 65 native flora species were recorded, none of which are of conservation significance, flora species diversity has increased over the survey years
- a total of 30 vertebrate fauna species were recorded:
    - 4 amphibians
    - 20 birds
    - 2 mammals
    - 4 reptiles
- one conservation significant fauna species were recorded, Blue-billed Duck (Oxyura australis)
- a total of three fauna habitats identified
- four bird and bat boxes were present
- a total of 51 potential habitat trees were recorded.

Threats present within Booragoon Lake Reserve were identified and determine how the City is performing in relation to measurable indices outlined in the City's Natural Areas Asset Management Plan (NAAMP). Threats identified include:

- physical disturbances in the form of litter and informal tracks
- no evidence of recent fire, with a previous fire event recorded in 2005
- a total of 66 weed species identified across the survey area, which is the highest recorded weed species diversity
- one declared pest species was recorded across the survey area, Rainbow Lorikeet (*Trichoglossus moluccanus)
- European Bees, considered to be high priority for control, were recorded within a nesting box
- no evidence of plant diseases or pathogens were recorded
- the values recorded for arsenic, chromium, copper, mercury, lead, zinc, and pH values were recorded within the acceptable ANZECC guidelines
- the values recorded for aluminium, iron, total nitrogen, total phosphorus, dissolved oxygen and conductivity exceed the ANZECC guidelines

- no evidence of impacts from reticulation
- no evidence of climate change impacts during the time of the survey; however, a summer investigation is undertaken by the City to better understand any climatic changes on the wetlands.

Management strategies to improve and maintain assets and to contain and reduce threats include:

- continue undertaking weed control, focusing on very high and high impact weeds
- continue undertaking revegetation activities
- continue to support community involvement
- removal of feral European Bees
- revegetate informal tracks
- continue rubbish removal
- continue graffiti removal
- undertake fire fuel load reduction
- continue to prevent the spread and introduction of plant diseases and pathogens
- monitor stormwater quality
- consider enhancing vegetation in stormwater drains that promote nutrient stripping and filter stormwater into the lake
- investigate presence of acid sulfate soils
- monitor and manage reticulation to ensure that there is no overspray
- continue monitoring climate change impacts

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1 Introduction

1.1 Background

Strategic reserve plans (SRP) are required to be developed for selected reserves and periodically updated according to the guidance provided in the City of Melville's Natural Areas Asset Management Plan (NAAMP). Content discussed in detail in the NAAMP is not repeated in this SRP; it is recommended that this document is applied in conjunction with the guidance provided in the NAAMP (Woodgis, 2019).

Three previous management plans have been developed for Booragoon Lake Reserve:

- Booragoon Lake Reserve Management Plan (Bennett Brook Environmental Services, 2004), referred as the 2004 Management Plan
- Booragoon Lake Reserve Strategic Management Plan (Natural Area Consulting Management Services, 2012), referred as the 2012 Management Plan
- Booragoon Lake Reserve Strategic Management Plan (Ecoscape, 2019), referred as the 2019 Management Plan.

1.2 Objectives

The objective of this management plan is to update and expand on content provided in the previous management plans. The outcomes and effectiveness of management strategies, objectives and guidelines set in the previous management plans are reviewed to develop appropriate recommendations in future management plans. The finalised strategic management reserve is intended to guide management activities in the reserve for the proceeding five-year period.

1.3 Scope

Booragoon Lake Reserve is located in the suburb of Booragoon within the City of Melville. The reserve is 13.29 hectares and is approximately 10 km south of the Perth's Central Business District (CBD) (Map 1).

Under the framework described in the NAAMP this strategic management plan is required to:

- describe any environmental assets present (flora, fauna or vegetation communities, community usage and heritage)
- assess any change evident in the assets present, comparing against previous surveys and plans
- identify current potential threats to environmental assets
- identify management priorities
- identify reserve specific management strategies
- provide recommendations for implementation of reserve specific management strategies
- provide assessment of the success of previously identified objectives and management strategies with consideration of the use of these as leading or lagging indicators.

2 Assets

2.1 Reserve Assets

2.1.1 Bush Forever

Bush Forever Sites are regionally significant bushland and wetland areas within the Swan Coastal Plain that were identified as needing protection in Perth's Bushland Project (Government of Western Australia, 2000a, 2000b).

Booragoon Lake Reserve meets the key criteria listed in the City of Melville's NAAMP including representation of ecological communities, general criteria for the protection of wetland and coastal vegetation, and criteria not relevant to determination of regional significance (Table 1).

Table 1: Bush Forever Criteria, Booragoon Lake Reserve

Bush Forever Criteria	Comments
Representation of ecological communities	▪ within the vegetation complex Bassendean-Central and South. ▪ floristic community types comprise of Seasonal Wetlands.
General criteria for the protection of wetland and coastal vegetation	▪ contains Conservation Category Wetland (UFI 6502).
Criteria not relevant to determination of region significance	▪ contain aesthetic value including viewpoint of the lake. ▪ contain sites of significance for Aboriginal people. ▪ contains bushland tracks for recreation values.

Source: Government of Western Australia (2000a, 2000b) and the NAAMP

Table 2: Bush Forever Listing Indicator

Asset	Objective	Assessment of Success
Bush Forever Listing	Monitor - no change to Bush Forever system expected.	Successful

2.1.2 Ecological Linkages

Ecological linkages are broadly mapped patches of remnant isolated bushlands that represent link habitats to facilitate ecological movements and process across a landscape. Ecological linkage can maintain genetic diversity of flora and fauna species and provide refuge for fauna to move between natural bushlands.

City of Melville's NAAMP (2019) assessed Booragoon Lake Reserve to be of a very high value linkage. The reserve forms part of the Beeliar Regional Park linkage and serves as local linkages between Blue Gum and Bateman reserves and is part of Greenway 95 (Alan Tingay and Associates, 1998).

Table 3: Ecological Linkages Indicator

Asset	Objective	Assessment of Success
Ecological Linkages	Monitor - no change to Ecological linkages expected.	Successful

2.2 Site Assets

2.2.1 Vegetation

Vegetation Types

The vegetation types across Booragoon Lake Reserve were mapped by Natural Area in accordance with the Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority (EPA), 2016). The full methodology is provided in Appendix 1.

A total of four vegetation types were present across the Booragoon Lake Reserve, including:

- Melaleuca rhaphiophylla and Melaleuca teretifolia woodland
- Eucalyptus rudis and Melaleuca rhaphiophylla woodland
- parkland
- open water

In 2018 the Eucalyptus rudis and Melaleuca rhaphiophylla woodland was split into two separate vegetation types, areas with revegetation and areas without revegetation. The two vegetation types have been combined to represent the Eucalyptus rudis and Melaleuca rhaphiophylla woodland. Machaerina articulata rushland was recorded in 2018, this vegetation type was not recorded in the 2023 survey due to the vegetation type being inundated with water.

Across the different survey periods there has been changes in the survey technical guidance, this has altered the vegetation classification system and the intensity of the surveys undertaken. It has been suggested from aerial imagery and previous assessment undertaken by Ecoscape in 2018 that the vegetation types have remained relatively stable over the years.

A summary of the vegetation types across the strategic management plans are provided in Table 4. The vegetation types from the 2023 survey are described in detail in Table 5 and displayed in Map 2.

Table 4: Summary of vegetation types recorded within the reserve across the strategic management plans

2004 Management Plan	2012 Management Plan	2019 Management Plan	2024 Management Plan	Extent Summary	
				Area (ha)	%
Eucalyptus woodland	*Eucalyptus rudis* woodland	*Eucalyptus rudis* and *Melaleuca rhaphiophylla* woodland	*Eucalyptus rudis* and *Melaleuca rhaphiophylla* woodland	3.51	26.43
Transitional vegetation					
Melaleuca woodland	*Melaleuca* woodland	*Melaleuca rhaphiophylla* and *Melaleuca teretifolia* low woodland	*Melaleuca rhaphiophylla* and *Melaleuca teretifolia* woodland	4.96	37.35
-	-	*Machaerina articulata* rushland	-	-	-
Open water/aquatic vegetation	-	Water	Open water	4.09	30.80
Parkland	Landscaped areas	Parkland	Parkland	0.72	5.42

Table 5: Vegetation types recorded across the reserve

Code	Vegetation Type	Vegetation Description	Photo
ErMrW	*Eucalyptus rudis* and *Melaleuca rhaphiophylla* woodland	A woodland of *Eucalyptus rudis* and *Melaleuca rhaphiophylla* over mixed shrubs and herbs	
MrMtW	*Melaleuca rhaphiophylla* and *Melaleuca teretifolia* woodland	A woodland of *Melaleuca rhaphiophylla* and *Melaleuca teretifolia* over mixed herbs	

Code	Vegetation Type	Vegetation Description	Photo
Open water	Open water	Open water	
Parkland	Parkland	Parkland	

Vegetation Condition

Vegetation Condition on site ranged from degraded to very good (Table 6, Map 3)

The very good portion of the reserve was located within the Melaleuca rhaphiophylla and Melaleuca teretifolia woodland which had evidence of revegetation activities and / or a reduced number of weeds present, likely due to water inundation supressing weeds that would have been present.

A large portion of the reserve was in degraded condition with a reduced understory and high weed loads, these areas require management techniques to be put in place to improve the condition of the reserve. A portion of the reserve regarded as degraded is due to the presence of dense Bracken Fern (Pteridium esculentum) which has limited the diversity of native species.

Table 6: Vegetation condition extents recorded across the natural areas

Vegetation Condition	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
Area (ha)	0.00	0.00	2.71	2.20	3.57	0.00	8.48
Area (%)	0	0	32	26	42	0	100

The vegetation condition extent of the natural areas makes up 64 % of the survey boundary, the remaining 36 % is comprised of:

- 5 % parkland
- 31 % open water.

Ecological communities

The wooded wetlands that support colonial waterbird nesting areas priority ecological community (PEC) is present within Booragoon Lake Reserve (Department of Biodiversity, Conservation, and Attractions (DBCA), 2023a). This priority ecological community is listed for protection under the Biodiversity Conservation Act 2016 (WA) and is significant as it forms and/or supports the habitat required for waterbird nesting.

The site is not representative of any currently described threatened ecological community listed for protection under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 (Cwlth).

Table 7: Vegetation Asset Indicator

Asset	Objective	Assessment of Success
Vegetation type diversity	Maintain or Enhance - four vegetation types are currently described.	Unsuccessful - Two main vegetation types are present. At the time of the survey the vegetation regarded as *Machaerina articulata* rush land was inundated with water.
Extent of native vegetation	Maintain or Enhance - expand area of native vegetation.	Successful
Condition of native vegetation	Maintain or Enhance - improve condition of native vegetation.	Unsuccessful - increase in the portion of the reserve regarded as degraded.
Significant communities	Maintain or Enhance - improve overall condition of native vegetation.	Successful

2.2.2 Wetlands

The wetland feature (UFI 6502) present within Booragoon Lake Reserve is a Conservation Category Wetland (DBCA, 2023). The wetland contains a priority ecological community and is predominantly in a good or higher condition, therefore, still meets the criteria to be classified as a Conservation Category Wetland. Booragoon Lake Reserve is a component of the eastern wetland chain of Beeliar Regional Park.

The 2004 Management Plan indicates that the Booragoon wetland has contained permanent water since the area was urbanised. Prior to 1990, during the 1970s and 1980s the City artificially maintained water levels over the summer through the use of borewater. Since 1990, the City has no longer artificially maintained the lake levels. The Booragoon wetland is considered a seasonal wetland, with fluctuating water levels and periods of intermittent inundation.

Table 8: Wetland Asset Indicator

Asset	Objective	Assessment of Success
Conservation Category Wetland listing	Maintain or Enhance - environmental criteria leading to listing as Conservation Category.	Successful

2.2.3 Heritage

The reserve is within the Whadjuk People Indigenous Land Use Agreement area. The heritage sites are specifically protected under the EPBC Act 1999, Aboriginal Heritage Act 1972 and/or Heritage Act 2018 (WA).

One registered site of significance (3298) under the Aboriginal Heritage Places was present within Booragoon Lake Reserve. Booragoon Lake (3298) is registered as an Artefacts / Scatter, Camp. Booragoon Lake (25386) is listed on the Heritage Council Local Heritage Survey, which has been recommended for the State Heritage listed for its importance as a natural environment and association with Beeliar Noongars.

Table 9: Heritage Asset Indicator

Asset	Objective	Assessment of Success
Registered Heritage Site	Monitor - remain aware to new heritage discoveries or changes to conditions. Any works causing significant disturbance in mapped area should be discussed with Department of Lands Planning and Heritage.	Successful - additionally Booragoon Lake has been recommended to be State Heritage listed (25386).

2.2.4 Community Interest

Booragoon Lake Reserve is identified as being a High value community site in the NAAMP. Community and natural resource management organisations are active in the reserve. Groups include:

- Friends of Booragoon and Blue Gum Lakes (FoBBGL)
- South East Centre for Urban Landcare (SERCUL)
- Wirambi Landcare
- local residents.

FoBBGL and SERCUL have undertaken project works within the reserve including weed control works in revegetation and bushland areas, revegetation planting, and removal of rubbish.

Table 10: Heritage Asset Indicator

Asset	Objective	Assessment of Success
Community Interest	Maintain or Enhance - improve number or size of active community groups and area being actively managed.	Successful

2.2.5 Reference Sites

No reference sites for long term monitoring or research have been established in Booragoon Lake Reserve.

Table 11: Reference Site Asset Indicator

Asset	Objective	Assessment of Success
Reference Sites	Monitor - no change expected.	Un-assessable

2.3 Species

The survey of Booragoon Lake Reserve assessed the flora and fauna species present with the reserve boundaries. Native flora and fauna are described in section 2.3.1 and 2.3.2 with introduced species described within the Threats sections 3.3 and 3.5.

2.3.1 Native Flora

A compile of all previous survey undertaken within Booragoon Lake Reserve since 2004 identified a total of 87 native flora species recorded from 30 families. The compiled data makes up approximately 18 % of the native flora species indicated in the NAAMP recorded within the City. Examples of native flora species present across the reserve are displayed in Figure 1.

The 2012 Management Plan included the flora records from the 2004 Management Plan and identified a total of 47 native flora species from 25 families. The 2019 Management Plan identified 34 native flora species from 13 families. The 2023 spring survey identified a total of 65 native flora species recorded from 23 families during the field survey. A compile of the native flora species identified across each survey period are provided in Appendix 3.

The overall native species diversity decreased from the compiled 2004 and 2012 survey data compared to 2018 survey data, decreasing by 13 species. The 2023 spring survey data contained the highest number of native species recorded with an additional 31 species than the 2018 survey data.

No conservation significant species were identified during the surveys. The listed very high value plant species described in the NAAMP have not been identified during any of the surveys undertaken from 2004 to 2023.

Regelia inops

Acacia pulchella (Prickly Moses)

Melaleuca systena (Coastal Honeymyrtle)

Hemiandra pungens (Snakebush)

Figure 1: Examples of native flora species recorded across the reserve.

Table 12: Native Flora Asset Indicator

Asset	Objective	Assessment of Success
Species diversity	Maintain or Enhance - increase native species diversity.	Successful
Very high value plant species	Monitor - none of these species are currently known from the reserve.	Successful

2.3.2 Native Flora

A compile of all previous survey undertaken within Booragoon Lake Reserve since 2004 identified a total of 125 native vertebrate fauna species recorded from 47 families. The compiled data makes up approximately 47 % of the native fauna species indicated in the NAAMP recorded within the City. Examples of native fauna species recorded across the reserve are provided in Figure 2.

The 2012 Management Plan included the fauna records from the 2004 Management Plan and community records and identified a total of 92 native fauna species from 27 families. The 2019 Management Plan identified 42 native fauna species during the survey from 25 families. The 2023 spring survey identified a total of 30 native fauna species recorded from 20 families during the field survey. The number of native fauna species recorded across the reserve grouped by class is provided in Table 13. The native fauna recorded in 2023 and a table comparing occurrences listed in the previous management plans from 2004 to 2019 are provided in Appendix 4.

The joint 2004 Management Plan and the 2012 Management Plan records include community records, the

community records for the 2019 Management Plan are included in Appendix 4, the community records are not provided in the data below due to possible false positives. Community records can provide an indication of the species that utilise the site all year round which a single season survey cannot determine.

The 2019 Management Plan recorded four additional mammals compared to the 2024 Management Plan, predominately comprised of bat species, this change could be due to differences in sampling methodology. The methodology undertaken in spring 2023 are provided in Appendix 1, which undertook nocturnal recordings using a handheld acoustic recorder.

One conservation significant fauna species was recorded within Booragoon Lake Reserve, Blue-billed Duck (Oxyura australis), the Blue-billed Duck in Priority 4 underneath the Biodiversity Conservation Act 2016 (WA). The Blue-billed Duck has previously been recorded and present on site in the 2012 Management Plan and the 2019 Management Plan.

Table 13: Number of native fauna species recorded grouped by class

Class	2012 Management Plan	2019 Management Plan	2024 Management Plan
Amphibian	2	3	4
Birds	85	26	17
Mammals	0	5	1
Reptiles	3	4	4

Western Three-lined Skink (*Acritoscincus trilineatus*)

Australasian Grebe (Black-throated Grebe) (*Tachybaptus novae-hollandiae*)

Common Brushtail Possum, Koomal (*Trichosurus vulpecula*)

Grey-breasted White-eye (Silvereye) (*Zosterops lateralis*)

Figure 2: Examples of native fauna species recorded across the reserve.

A total of 3 fauna habitat types were recorded across Booragoon Lake Reserve, 51 potential black cockatoo habitat trees, and 4 bird and bat boxes (Table 14, Map 4). Across the reserve there is suitable habitat for refuge with areas of dense understory, leaf litter and fallen logs. The on-ground survey assessed potential habitat trees (with a DBH greater than 300mm) across the reserve if they were present within the grid survey point. Of the 51 potential habitat trees recorded, 10 were observed to contain hollows, with the total number of hollows observed being 11. The bird and bat boxes across the survey area were established between 2018 and 2023 by the City.

Table 14: Fauna habitat types present across the survey area.

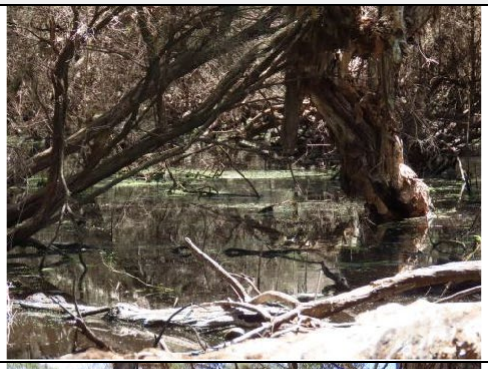
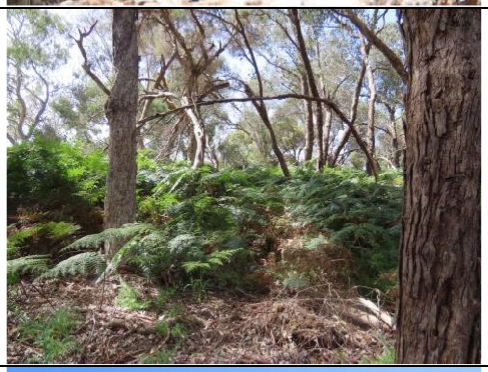
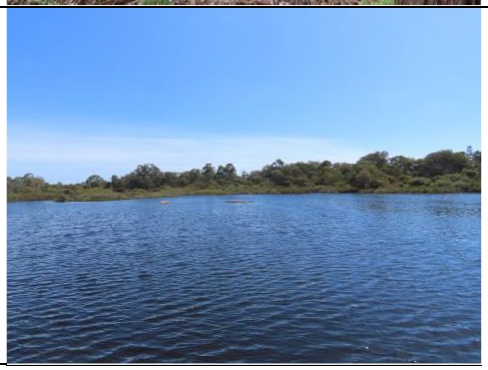
Fauna Habitat Type	Description	Photograph
Paperbark woodland	A woodland of *Melaleuca rhaphiophylla*, and *Melaleuca teretifolia* over sedgeland	
Eucalyptus woodland	A woodland of *Eucalyptus rudis* and *Melaleuca rhaphiophylla*.	
Open water	Open water body	

Table 15: Native Fauna Asset Indicator

Asset	Objective	Assessment of Success
Mammal species	Maintain - continue to protect species diversity and manage habitat to allow ongoing use of reserve by species.	Unsuccessful
Amphibian species		Successful
Reptile species		Successful
Bird species		Unsuccessful

3 Threats

Significant threats to natural areas in the City were identified in the NAAMP. The 10 most significant threats include physical disturbance, fire, weeds, habitat loss, feral animals, disease and pathogens, stormwater, reticulation, acid sulfate soils, and climate change. The success of each of the threats as outlined against the objectives provided in the 2019 Management Plan are described at the bottom of each threat discussed.

3.1 Physical Disturbance

Inappropriate access and the presence of rubbish was evident at Booragoon Lake Reserve. The rubbish and inappropriate access points were at low levels with only a few occurrences noted. The physical disturbances recorded across Booragoon Lake Reserve over the survey years are indicated in Table 15 and locations are displayed in Map 5.

Rubbish and vandalism removal across the reserve is undertaken on a regular basis by community groups and the City. As the rubbish and vandalism was noted as minimal during the field survey it is suggested that the effort undertaken to control physical disturbance is relatively effective and is recommended to continue.

Table 16: Physical Disturbances recorded across Booragoon Lake Reserve over the survey years

Physical Disturbance	2012 Management Plan	2019 Management Plan	2024 Management Plan
Informal track development	None	40 m over one track on eastern side of lake.	40 m over one track on eastern side of lake.
Disturbance for likely propagation of prohibited substances	None	Point 6 at end of informal track, site inactive.	None
Rubbish dumping	Minimal litter close to pathways. Small amount of wind dispersed paper litter within vegetation. No garden waste dumping observed but considered to have historically occurred.	Small amount of wind/ water transported along Leach Highway Road verge and around storm water drain at western edge.	Minimal litter along the pathways, and minimal litter within the vegetation. Higher accumulation of litter near storm drain.
Tree poisoning	None	None	None
Illegal clearing	None	None	None
Firewood collection	None	None	None
Vandalism	Small amount on signage. Little disturbance in native vegetation.	Small amount on signage.	None

3.2 Fire

The NAAMP identified that small urban bushland remnants are more susceptible to the negative impacts of fire. Frequent fire events and large fire extent that impact more than 50 % of the reserve are more likely to experience local extinction of fire vulnerable species.

In the 2012 management plan 0.8 ha a fire occurred in the southeast portion or the reserve in 2005, this fire was described as a hot canopy fire causing significant damage to vegetation. Areas of dense bracken

fern (Pteridium esculentum) was present across the survey area which corresponds with the burnt area from the 2005 fire. Across the survey area there was a high accumulation of leaf litter including dead branches, it is recommended that fire fuel load reduction activities are undertaken across the reserves. Bushfire control and management should be undertaken in line with the City of Melville's Bushfire Management Guideline (2019).

Table 18: Fire Threat Indicator

Threat	Objective	Assessment of Success
Fire	Prevent - manage the reserve so as to prevent any large (>50 % of reserve burnt) or overly frequent (frequency <8 years) fires occurring.	Successful

3.3 Weeds

A compile of all previous survey undertaken within Booragoon Lake Reserve since 2004 identified a total of 94 weed species recorded from 36 families.

The 2012 Management Plan included the flora records from the 2004 Management Plan and identified a total of 54 weed species from 27 families. The 2019 Management Plan identified 41 weed species from 22 families. The 2023 spring survey identified a total of 66 weed species recorded from 29 families during the field survey. A compilation of the weed species identified across each survey period is provided in Appendix 5.

The overall weed species present across the reserve decreased from the compiled 2004 and 2012 survey data compared to 2018 survey data, decreasing by 13 species. The 2023 spring survey data contained the highest number of weed species recorded with an additional 25 species than the 2018 survey data. The combined weed density on the western side of Booragoon Lake Reserve has decreased in compared to the 2019 Management Plan. An increase in the weed density is evident in the northern component of Booragoon

Lake Reserve compared to the 2019 Management Plan. The differences in weed species present across the survey area over the survey periods is attributed to seasonal changes and weed control activities undertaken within the reserve.

The NAAMP classifies weed species into impact classes of very high, high, medium and low. The number of species present across each impact classes across the survey periods are provided in Table 19 and further categorised into type in Table 20. The location of weeds present across the survey area are provided in Map 5 to 14.

A total of five declared pest and Weeds of National Significance (WoNS) were identified across the survey area during the 2023 field survey, including:

- Arum Lily (*Zantedeschia aethiopica) (DP and WoNS)
- Bridal Creeper (*Asparagus asparagoides) (DP and WoNS)
- Common Prickly Pear (*Opuntia stricta) (DP and WoNS)
- Golden dodder (*Cuscuta campestris) (DP)
- *Anredera cordifolia (WoNS).

*Moraea flaccida (DP) was recorded in the 2012 Management Plan but has not been recorded within the site since. Declared pests are listed on the Western Australian Organism List (WAOL) (Department of Primary Industries and Regional Development (DPIRD), 2023), under the Biosecurity and Agriculture Management Act 2007 (WA). This classification requires the landowner/land manager to control the

population to limit damage as a result of the presence of these species (DPIRD), 2019).

It is recommended that weed control is undertaken across the reserve prioritizing declared pest, WoNS and the species listed under the very high impact class. Weed management across the reserve is undertaken in accordance with the City of Melville's Environmental Weed Management Guidelines (2018).

Table 19: Number of weed species within each impact class recorded over the survey years

Impact Class	2012 Management Plan	2019 Management Plan	2024 Management Plan
Very High	8	6	6
High	27	20	31
Medium	2	0	4
Low	17	15	25

Table 20: Weeds recorded within each rating and category over the survey years

Rating	Weed	2012 Management Plan	2019 Management Plan	2024 Management Plan
Very High	Bridal Creeper	X	X	X
	Arum Lily	X	X	X
	One Leaf Cape Tulip	X		
	Golden Dodder			X
	Madeira Vine	X	X	X
	Perennial Clumping Grass			
	African Love Grass	X		
	Perennial Veldt Grass	X	X	X
	Vasey Grass	X	X	
	Brazilian Pepper	X	X	X
High	Annual Clumping Grasses	6 species	4 species	7 species
	Perennial Running Grasses	3 species	2 species	3 species
	Clumping Geophytes	8 species	2 species	3 species
	Giant Grasses	1 species	1 species	
	Trees and Shrubs	9 species	11 species	18 species
Medium	All Other Perennial Weeds	2 species		4 species
Low	All Other Annual Weeds	17 species	15 species	25 species

Table 21: Weeds Threat Indicator

Threat	Objective	Assessment of Success
Very High Impact weed specie	Eliminate - Arum Lily, Bridal Creeper, Brazilian Pepper, Madeira Vine Contain- Perennial Veldt Grass (*Ehrharta calycina, Paspalum dilatatum).*	Unsuccessful
High Impact weed species	Eliminate - Clumping Geophytes, Giant Grasses (Pampas Grass), Contain-Annual Clumping Grasses, Perennial Running Grasses (Kikuyu and Couch), Trees and Shrubs.	Unsuccessful
Medium and Low Impact weed species	Contain - species Fumaria (*Fumaria capreolata*). Manage - reduce impact on bushland or revegetation projects when possible.	Unsuccessful

3.4 Habitat Loss

Habitat loss is a significant threat to the long-term viability of some species in urban areas. The NAAMP identified that fragmentation can reduce species diversity and immediate loss of species diversity.

The vegetation complex of Booragoon Lake Reserve is Bassendean Complex- Central and South. The pre- European extent of this vegetation complex remaining is:

- 26.87 % within the Swan Coastal Plain
- 2.56 % within the City of Melville (Government of Western Australia, 2019).

The NAAMP identified that habitat loss can be assessed by determining the native species cover, bare ground, weed cover and increased fire risk with dense grass infestation. Bare ground cover, weed cover and vegetation condition was assessed across the survey area to determine potential habitat loss.

Weed density were higher on the southeastern section of the reserve compared to the western section of the reserve (Map 16). Bare ground was greater than 25 % towards the outskirts of the reserve, particularly within areas previously identified for revegetation works (Map 17). Bare ground has a higher risk of erosion, it is important to revegetated areas of bare ground to mitigate the impact of erosion on the environment. Bare ground and combined weed density has not been recorded in previous management plans and so was unable to make a comparison to determine possible habitat loss.

Vegetation condition of the site was compared to the vegetation condition recorded in the 2019 Management Plan (Table 22). Overall, the reserve has decreased in condition, the portion of the reserve recorded in very good condition has decreased, with the portion of the reserve in good and degraded condition has increased. The vegetation condition was unable to be compared to the management plans prior to the 2019 Management Plan due to changes in the survey technical guidance, this has altered the vegetation classification system and the intensity of the surveys undertaken. A portion of the reserve regarded as degraded is due to the presence of dense Bracken Fern (*Pteridium esculentum*) the density of Bracken Fern should be reduced to allow for a higher diversity of native species within the vegetation.

The City has established four bird and bat boxes across the site since 2018, increasing available habitat. It is recommended that weed management alongside revegetation works to improve the vegetation condition.
Areas suitable for revegetation incorporate the areas previously identified for revegetation and additional

areas outlined in Map 19. It is recommended that further revegetation works, including infilling are undertaken across the reserve.

Table 22: Vegetation condition comparison between the survey years

Vegetation Condition	2019 Management Plan (%)	2024 Management Plan (%)
Pristine	0	0
Excellent	0	0
Very Good	62	32
Good	13	26
Degraded	25	42
Completely Degraded	0	0

Table 23: Habitat Loss Threat Indicator

Threat	Objective	Assessment of Success
Habitat Loss	Manage - prevent habitat loss at reserve scale	Unsuccessful

3.5 Feral Animals

A total of four introduced vertebrate fauna species were identified during the 2023 field survey, Laughing Kookaburra (*Dacelo novaeguineae), House Mouse (*Mus musculus), Spotted Turtle Dove (*Spilopelia chinensis), and Rainbow Lorikeet (*Trichoglossus moluccanus) (Table 24).

The three species are listed by the city as very high impact: Feral Cat, Fox, and Rabbit. These very high impact introduced animals were not identified during the field survey. The NAAMP notes that feral cats, identified as very high impact, were present in high densities throughout Booragoon Lake Reserve. It is likely that due to the proximity of urbanised development, the cats identified are likely to be free roaming domestic cats rather than feral. Evidence of cats across the reserves were not recorded during the 2023 field survey, there is the potential for the occurrence of cats within the reserves due to the proximity to urbanised areas. It is recommended to control domestic and stray cats by promoting responsible pet ownership through education and awareness campaigns to the residents within the City.

One declared pest was present during the field survey, Rainbow Lorikeet (*Trichoglossus moluccanus). Both Rainbow Lorikeet (*Trichoglossus moluccanus) and Laughing Kookaburra (*Dacelo novaeguineae) were identified in the NAAMP as competing with native birds for resources, including tree hollows.

Two species are listed as High Impact introduced animals: European Bee and One-spot Livebearer (a fish). Active control programs for the listed terrestrial species are undertaken on an ongoing basis by contractors for the City under the Feral Animals Management Guidelines (City of Melville, 2015). European Bees was recorded within one of the nest boxes (Figure 3), the location of the beehive is displayed on Map 20.
Contractors for European Bees control removed four hives in 2021-2022, and five hives in 2022-2023. European Bee removal is to continue to be undertaken by contractors to reduce the threat of European Bees occupying native fauna habitat.

Table 24: Feral Animals recorded across Booragoon Lake Reserve

Impact Rating	Feral Animal Species	2012 Management Plan	2019 Management Plan	2024 Management Plan
Very High	Feral Cat		X	
	Fox	X		
	Rabbit	X		
High	European Bee	X	X	X
	One-spot Livebearer			X
Non-Priority	Black Rat		X	
	House mouse			X
	Mallard Duck		X	
	Laughing Kookaburra	X	X	X
	Laughing Turtle Dove	X	X	
	Spotted Dove	X	X	
	Rainbow Lorikeet	X	X	X

Figure 3: European Bees recorded within a nesting box.

Table 25: Feral Animal Threat Indicator

Threat	Objective	Assessment of Success
Feral Cats	Manage - reduce numbers (within guidelines).	Successful
Fox and Rabbits	Manage - exclude from area (prevent reintroduction).	Successful
European Bee	Manage - reduce presence.	Unsuccessful
Feral Waterfowl	Prevent - exclude from the area if more than four individuals observed.	Successful

3.6 Diseases and Pathogens

Introduced diseases or pathogens, including Phytophthora dieback, have not been identified in previous management plans or the NAAMP for Booragoon Lake Reserve. No evidence of plant diseases requiring investigation were identified in 2023 field survey.

Table 26: Disease and Pathogens Threat Indicator

Threat	Objective	Assessment of Success
Diseases and Pathogens	Prevent - ensure infestations of diseases and pathogens do not become established	Successful

3.7 Stormwater

Booragoon Lake Reserve is part of the Bull Creek catchment area. Booragoon Lake receives stormwater from the surrounding road, urban and garden catchments through six drains (Map 21).

The southwestern drain entrance includes a retention basin, rock riffles and a vegetated channel to allow for filtration. Weed control work and revegetation was evident surrounding the basin. The drainage basin in the northeast contained a high abundance of weeds. The drain located adjacent to Leach Highway has the potential to be the source of significant pollution if there is a fuel, oil or chemical spill, a valve is present on this drain to allow it to be closed if required. The remaining drains flow directly into the lake with minimal sedimentation or nutrient stripping.

Water quality sampling is undertaken at the reserve on an annual basis by SERCUL in partnership with the Department of Water and Environmental Regulation (DWER) and the City. The 2022 sampling report provides a summary of and a comparison to the previous 14 years of data (2007-2021) (SERCUL, 2022). The key results from this report and how this compares to ANZECC guidelines (ANZECC and ARMCANZ 2000) are summarised in Table 27. For detailed results please refer to the SERCUL 2022 report.

Table 27: Water quality and summary of results for Booragoon Lake Reserve

Water Quality Parameter	Substrate	Result	Summary of Results
Metals	Aluminium	0.078 mg/L	Exceeded the ANZECC 95% protection guideline
	Arsenic	0.002 mg/L	Acceptable of the ANZECC 95 % protection guideline
	Chromium	<0.001 mg/L	Acceptable of the ANZECC 95 % protection guideline
	Copper	0.0012 mg/L	Acceptable of the ANZECC 95 % protection guideline
	Iron	2.5 mg/L	Exceeds ANZECC guidelines
	Mercury	<0.00006 mg/L	Acceptable of the ANZECC 99 % protection guideline
	Lead	0.0012 mg/L	Acceptable of the ANZECC 95 % protection guideline
	Zinc	0.013 mg/L	Acceptable of the ANZECC 99 % protection guideline
Nutrients	Total Nitrogen	3.4 mg/L	Exceeded the ANZECC trigger values
	Total Phosphorus	1.05 mg/L	Exceeded the ANZECC trigger values
Physical	pH	6.52	Within the acceptable range of 6.5 to 8.0
	Dissolved oxygen	26.55%	Dissolved oxygen is low, and below the ANZECC acceptable range of 90 – 110 %
	Conductivity	1.925 mS/cm	Conductivity values outside of the ANZECC acceptable range

The Water Quality Improvement Plan (Emerge Associates, 2023) report determined the following:

- pH is predominantly below the acceptable lower range between 3.34 and 7, with a median pH of 6.52. The data trend indicates that the pH is improving and becoming less acidic over time
- dissolved oxygen is below the expected lower range (experiencing dissolved oxygen at 0 % approximately once a year). The data trend indicates that dissolved oxygen saturation is progressively declining over time and reports a median of 26.55 %
- a median electrical conductivity of 1.93 mS/cm with a high variability in concentrations. The data trend shows improvements with electrical conductivity concentrations to be within the acceptable range.
- median total nitrogen concentration is 3.4 mg/L and data trend indicates improvements in total nitrogen concentrations with less variability
- the median concentration of total phosphorus is 1.05 mg/L with the highest total phosphorus recorded
- 8.3 mg/L in January 2009. Since then, extreme exceedances have lowered with the most recent high exceedance being 5.5 mg/L in October 2017.The trendline indicates total phosphorus stability, with a minor improvement
- soluble iron concentrations consistently report high exceedances of the trigger value, with a median of
- 2.5 mg/L. The data trend indicates a gradual increase in concentrations
- soluble aluminium concentrations consistently reports high exceedances of the trigger value, with a median of 0.0835 mg/L and low variability in concentrations. The data trend indicates a gradual decline in concentrations.

The SERCUL 2022 report concluded that Booragoon Lake Reserve is considered to have one of the poorest water qualities in the Bull Creek main drain catchment. These sites should be the focus of management responses to improve the quality of the sites. The recommendations provided by SERCUL to improve water quality in the lake are summarised below:

- continue replacing grass surrounding the lake with native species to prevent further ingress of grass into the lake and help filter runoff
- continue to remove and control other invasive species that contribute to organic loads into the lake

which contribute to large loads of organic material and prevent native growth
- revegetate all drainage outlets
- periodically remove excess sediment and litter from north-east drainage basin
- investigate use of Phoslock (or similar) to control/remove phosphorus
- consider increasing the lake pH; this may also reduce mobilisation of metals from sediment
- consider adding analysis for arsenic, mercury and nickel to future monitoring
- consider speciation testing for zinc and copper
- add macroinvertebrate testing to provide an indication of eutrophic status and species richness.

Water quality sampling for the City was undertaken by Emerge Associates in 2022. The 2023 sampling report provides a summary of and a comparison to the historic water quality data collected. The key recommendations from this report are summarised in Table 28. The City is conducting internal water quality monitoring following the recommendations outlined in the Water Quality Improvement Plan provided by Emerge Associates.

Table 28: Recommendations outlined in the Water Quality Improvement Plan

Priority	Recommendation	Timeframe/duration
1	Inspect and if present remove excess sediments and gross pollutants at discharge locations into the lake and the immediately upstream stormwater pit/s and gross pollution traps.	Annually prior to first flush rainfall event and/or when excessive sedimentation and/or gross pollutant accumulation is observed.
1	Assess and where present or problematic, manually remove aquatic weeds and/or algae. Manual removal to be considered in preference to herbicides/algicides.	Review aquatic weed cover biannually, and if required, undertake weed control twice a year nominally in summer and spring.
1	Assess waterway edges and stormwater inflow pathways and where present, undertake weed control and revegetate with native species. Ensure the discharge locations into the wetland are not blocked by weeds and/or grass ingress.	Review weed cover bi-annually, and if required, undertake weed control twice a year in autumn/winter and spring.
2	Collect groundwater quality samples from a nearby bore to compare with surface water data, to determine whether groundwater is influencing/contributing to surface water quality.	Quarterly and where possible to align with surface water monitoring.
3	If increased frequency of manual maintenance does not improve water quality, consider installation of gross pollution traps and/or vegetated swales at discharge locations into the lake to control gross pollutants, sedimentation, and to provide nutrient removal.	Prior to Autumn 2024.
2	Continue monitoring total phosphorus. If total phosphorus continues to report high concentrations, consider use of treatment methods for the control/removal of phosphorus in a wetland environment e.g. Phoslock.	Reassess at the end of 2023 monitoring program.
3	Investigate the feasibility of removing sediments and organic debris from the base of the wetland to remove accumulated nutrient and metal loads.	To be assessed if the above measures have not improved the condition of water quality.

Source: Emerge Associates, 2023.

Table 29: Stormwater Threat Indicator

Threat	Objective	Assessment of Success
Stormwater	Manage - ensure stormwater inflows into the lake are as clean as possible.	Indeterminate
Metals	Manage - ensure stormwater inflows into the lake are as clean as possible.	Unsuccessful
Nutrients	Manage - reduce nutrient addition to the lake.	Unsuccessful
Physical characteristics	Manage - ensure stormwater inflows into the lake are as clean as possible.	Unsuccessful

3.8 Reticulation

No reticulation is present in areas that may affect bushland, no sighting of excessive overspray was recorded to be impacting the bushland. The areas of reticulated grass in parkland are sufficiently buffered from bushland and wetland areas.

Table 30: Reticulation Threat Indicator

Threat	Objective	Assessment of Success
Reticulation	Manage - prevent overspray/leakage from reticulation entering bushland.	Successful

3.9 Acid Sulfate Soils

Assessment of the Acid Sulfate Soils Risk Map, Swan Coastal Plain (DWER-055) (DWER, 2017) shows Booragoon Lake Reserve has a high to moderate risk of having Acid Sulfate Soils. Acid Sulfate Soils have been identified across the lakes surface in Booragoon Lake Reserve in 2015 (D'Alessio, 2018).

The listing of the area as high to moderate risk and the presence of Acid Sulfate Soils requires that potential soil disturbance is considered for all proposed works in the mapped area. The NAAMP identifies that disturbance of or exposure to oxygen of the Acid Sulfate Soils has potential to cause significant environmental impacts and could lead to listing of the area as a contaminated site. Any soil disturbing works or excavations planned for the area requires a specific Acid Sulfate Soil investigation and management plan to mitigate risks.

Table 31: Acid Sulfate Soils Threat Indicator

Threat	Objective	Assessment of Success
Acid Sulfate Soils	Prevent - Prevent physical disturbance of acid sulfate soils. Any soil disturbing activates should undertake a risk assessment prior to commencement.	Indeterminate

3.10 Climate Change

Climate change within the south-west of Western Australia is expected to increase occurrences and intensity of weather events, decrease annual rainfall, and increase temperatures. These changes are likely to increase likelihood of erosion during storm events and increased water stress on plants. Decreases in water levels lead to a shift in vegetation types and complexes which has the potential to alter the ecosystem structure and function, including the fauna species that the environment supports. The decrease in rainfall and drop in water levels is recorded to have a higher impact on wetland environments, in which the plant species are dependent on hydrological niche. Decreases in groundwater levels are likely impacted by decreasing rainfall, groundwater abstraction and borewater extraction. It is important to monitor the water levels at Booragoon Lake Reserve and mitigate the reduction in water levels where possible to prevent the loss of ecosystem function and structure.

Table 32: Climate Change Threat Indicator

Threat	Objective	Assessment of Success
Climate Change	Manage - continue to manage climate change impacts.	Indeterminate

4 Implementation

The management objective and implementation strategies will be measured in relation to the Key Performance Indicators (KPI).

4.1 Key Performance Indicators (KPI)

Review of previous management objectives and an assessment of success was undertaken. Some objectives could not be assessed due to an unavailability of data to undertake an accurate assessment. A summary of the assessment of success of measurable indices for management objectives is provided in Table 33.

Table 33: Summary of Key Performance Indicators

Asset or Threat		Successful Indices	Unsuccessful Indices	Indeterminate or Un-assessable
	Bush Forever Listing	1	0	0
	Ecological Linkages	1	0	0
	Ecological Communities	2	2	0
	Wetlands	1	0	0

Assets	Heritage	1	0	0
	Community Interest	1	0	0
	Reference	0	0	1
	Native Flora	2	0	0
	Native Fauna	2	2	0
Threats	Physical Disturbance	3	1	0
	Fire	1	0	0
	Weeds	0	3	0
	Habitat Loss	0	1	0
	Feral Animals	3	1	0
	Diseases and Pathogens	1	0	0
	Stormwater	0	3	1
	Reticulation	1	0	0
	Acid Sulfate Soils	0	0	1
	Climate Change	0	0	1

4.1.1 Lagging Indicators

Lagging indicators are associated with changes and trends of assets. The tiered objects for assets and associated lagging indicators are indicated in Table 34. The implementation recommendations for each asset are described in Table 35.

Table 34: Tiered Objects for Assets and Associated Lagging Indicators

Objective	Lagging Indicator	Applicable When
Enhance	Increase in either: ▪ extent ▪ density ▪ abundance	Assets can be enhanced for reasonable cost or where enhancement may reduce operational costs
Maintain	No decrease in: ▪ extent ▪ density ▪ abundance	Asset can be maintained or when there is insufficient knowledge or resources currently available to enhance
Confirm	Decrease number of assets for which information is limited or none available	Potential to be present but currently unknown
Monitor	No measurable indicator	Assets that cannot be managed by action within the City or where asset is not considered critical

Table 35: Asset Management Objectives and Recommendations for 2024-2029

Section Reference	Asset	Sub head	Objective (Lagging Indicator)	Implementation Recommendation
2.1.1	Bush Forever Listing		Monitor - no change to Bush Forever Listing expected.	▪ No action required.
2.1.2	Ecological Linkages		Monitor - no change to Ecological linkages expected.	▪ No action required.
2.2.1	Ecological Communities	Vegetation type diversity	Maintain or Enhance - four vegetation types are currently described.	▪ Prevent introduction and spread of dieback and other diseases / pathogens. ▪ Continue weed management as outlined in the City's Environmental Weed Management Guideline. ▪ Prevent high intensity fires through fire fuel load reduction.
		Extent of native vegetation	Maintain or Enhance - expand area of native vegetation.	▪ Continue revegetation works prioritising areas which are in a degraded or completely degraded condition.
		Condition of native vegetation	Maintain or Enhance - improve condition of native vegetation.	▪ Continue revegetation works and weed management across the reserve.
		Significant communities	Maintain or Enhance - improve overall condition of native vegetation.	▪ Continue revegetation works and weed management across the reserve.
2.2.2	Wetlands	Conservation Category Wetland listing	Maintain or Enhance - environmental criteria leading to listing as Conservation Category.	▪ No action required.

Section Reference	Asset	Sub head	Objective (Lagging Indicator)	Implementation Recommendation
2.2.3	Heritage	Registered Heritage Site	Monitor - remain aware to new heritage discoveries or changes to conditions. Any works causing significant disturbance in mapped area should be discussed with Department of Lands Planning and Heritage.	▪ Works within mapped area must be discussed prior to the commencement of works and receive the appropriate permits through the Department of Lands, Planning and Heritage.
2.2.4	Community Interest		Maintain or Enhance - improve number or size of active community groups and area being actively managed.	▪ Support and maintain community partner relationships.
2.2.5	Reference Sites		Monitor - no change expected.	▪ No action required.
2.3.1	Native Flora	Species diversity	Maintain or Enhance - increase native species diversity.	▪ Continue revegetation works and weed management.
		Very high value plant species	Monitor - none of these species are currently known from the reserve.	▪ No action required.
2.3.2	Native Fauna	Mammal species	Maintain - continue to protect species diversity and manage habitat to allow ongoing use of reserve by species.	▪ Undertake feral animal control. ▪ Inform local residents regarding cat laws and promote responsible pet ownership. ▪ Enhance water quality.
		Amphibian species		
		Reptile species		
		Bird species		
		Fauna Habitat	Maintain or Enhance - increase the number of bird and bat boxes and number of suitable habitat trees.	▪ Increase number of bird and bat boxes to provide suitable habitat. ▪ Ensure that hollows and bird and bat boxes are maintained and are free from European Bees.

4.1.2 Leading Indicators

Leading indicators are associated with changes in the density / abundance / extent / occurrences of threats. The tiered objects for threats and associated leading indicators are indicated in Table 36. The implementation recommendation for each threat is described in Table 37.

Table 36: Tiered Objects for Threats and Associated Leading Indicators

Objective	Leading Indicator	Applicable When
Prevent	Prevent introduction or occurrence of	Threat not currently present in an area or the reserve
Eliminate	Reduce extent, density or abundance working towards eventual complete removal	Elimination is feasible Impact has potential to be high
Contain	Stop, restrict or reduce rate of spread or frequency of occurrence	Elimination is not feasible Impact has potential to be high
Manage	Limit negative impacts on assets	Threat is believed to be already at or near maximum impact
None	No measurable indicator	Threat is absent from reserve and will not be accidentally introduced or naturally develop

Table 37: Threat Management Objectives and Recommendations for 2024-2029

Section Reference	Threats	Sub head	Objective (Leading Indicator)	Implementation Recommendation
3.1	Physical Disturbance	Informal Tracks	Eliminate - reduce number and extent of informal tracks in bushland.	▪ Revegetate along informal tracks. ▪ Use natural materials (fallen logs) to block access to informal tracks to deter use.
		Rubbish Dumping	Manage - continue ongoing rubbish removal program. Maintain rubbish occurrence at low levels currently recorded, target no large occurrences of garden waste or household rubbish dumping.	▪ Continue rubbish removal across the reserve.
		Tree poisoning Illegal Clearing Firewood Collection	Prevent - no occurrences.	▪ Continue to promote values of natural areas.
		Vandalism	Manage - maintain current low levels of graffiti on signage only.	▪ Continue removal of graffiti across the reserve.
3.2	Fire		Prevent - manage the reserve to prevent any large (>50 % of reserve burnt) or overly frequent (frequency <8 years) fires occurring.	▪ Undertake fire fuel load reduction.
3.3	Weeds	Very High Impact weed species	Eliminate	▪ Continue weed management following the City's Environmental Weed Management Guideline.
		High Impact weed species	Eliminate	▪ Continue weed management following the City's Environmental Weed Management Guideline.

Section Reference	Threats	Sub head	Objective (Leading Indicator)	Implementation Recommendation
		Medium and Low Impact weed species	Contain - medium and low impact weed species. Manage - reduce impact on bushland or revegetation projects when possible.	▪ Continue weed management following the City's Environmental Weed Management Guideline.
3.4	Habitat Loss		Manage - prevent habitat loss at reserve scale.	▪ Continue revegetation works and weed management.
3.5	Feral Animals	Feral Cats	Manage - reduce presence (within guidelines).	▪ Inform local residents regarding cat laws and promote responsible pet ownership. ▪ Monitor populations and control if necessary, following the City's Feral Animals Management Guidelines.
		Fox and Rabbits	Manage - exclude from area (prevent reintroduction).	▪ Monitor and undertakeferal animal control if necessary, following the City's Feral Animals Management Guidelines.
		European Bee	Manage - reduce presence (within guidelines).	▪ Continue control and removal of European Bees following the City's Feral Animals Management Guidelines.
		Feral Waterfowl	Prevent - exclude from the area if more than four individuals observed.	▪ Monitor and undertakeferal animal control if necessary, following the City's Feral Animals Management Guidelines.
3.6	Diseases and Pathogens		Prevent - ensure infestations of diseases and pathogens do not become established.	▪ Monitor the vegetation, if there is the likelihood of any plant disease and pathogens undertake an assessment by an approved contractor.

Section Reference	Threats	Sub head	Objective (Leading Indicator)	Implementation Recommendation
3.7	Stormwater	Stormwater	Manage - ensure stormwater inflows into the lake are as clean as possible.	▪ Establish vegetation within the drains that will filter stormwater. ▪ Ensure that drains are not blocked by rubbish or weeds. ▪ Follow the management strategies outlined in the Water Quality Improvement Plan.
		Metals	Prevent and Contain - concentrations of metals to not exceed guidelines.	▪ Follow the management strategies outlined in the Water Quality Improvement Plan.
		Nutrients	Prevent and Contain - concentrations of metals to not exceed guidelines.	▪ Reduce fertiliser use within the community, inform residents regarding the impacts and other options. ▪ Establish nutrient stripping vegetation within the drains that will filter stormwater. ▪ Follow the management strategies outlined in the Water Quality Improvement Plan.
		Physical characteristics	Prevent and Contain - concentrations of metals to not exceed guidelines.	▪ Establish vegetation within the drains that will filter stormwater. ▪ Follow the management strategies outlined in the Water Quality Improvement Plan.
3.8	Reticulation		Manage - prevent overspray/leakage from reticulation entering bushland.	▪ monitor and continue to manage.

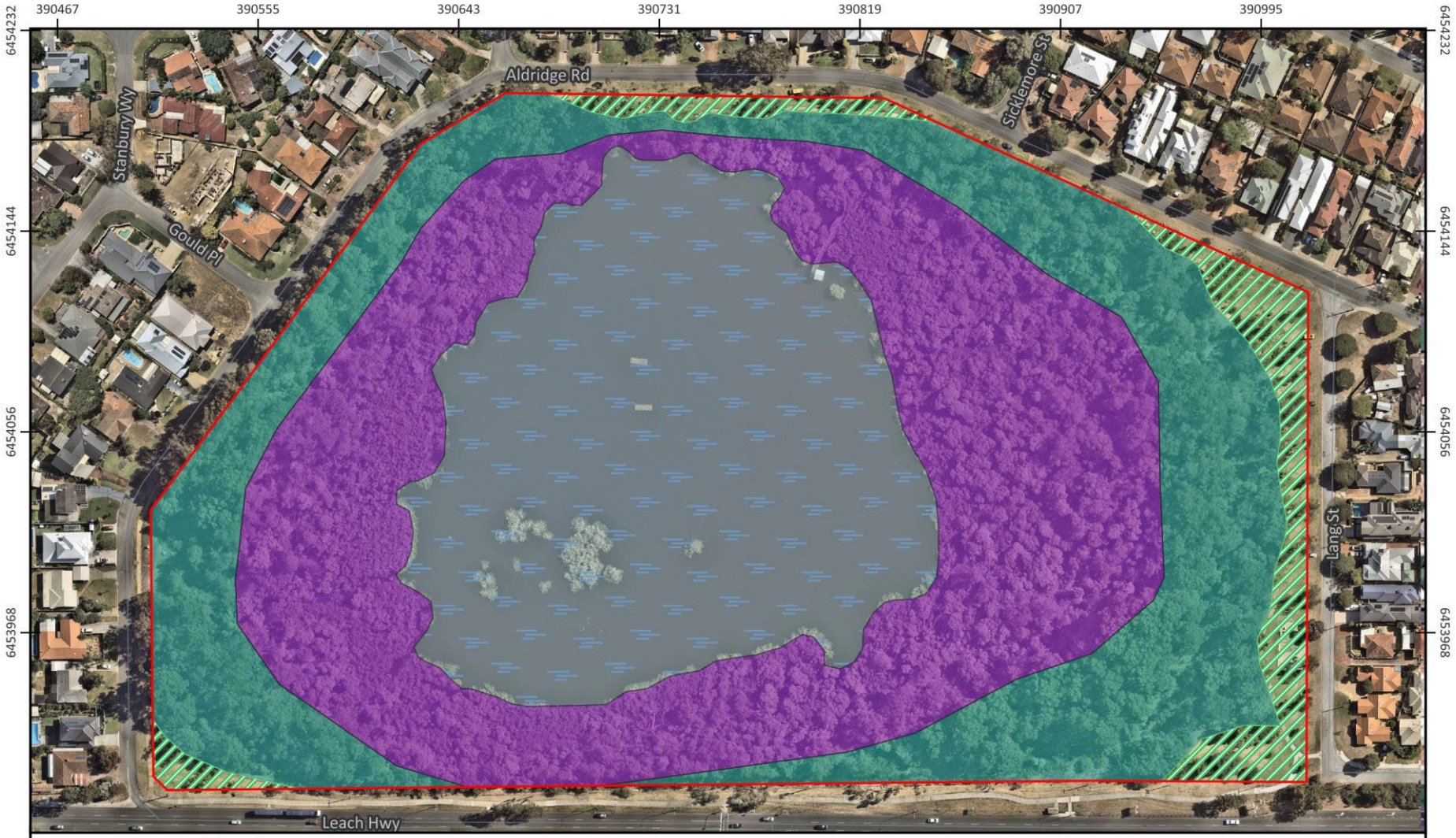
Section Reference	Threats	Sub head	Objective (Leading Indicator)	Implementation Recommendation
3.9	Acid Sulfate Soils		Prevent - prevent physical disturbance of acid sulfate soils.	▪ Investigate presence of acid sulfate soils. ▪ Works within mapped area must be managed inline with *Treatment and Management of Soil and Water in Acid Sulfate Soil Landscape* guidelines (DWER, 2015).
3.10	Climate Change		Manage - continue to manage climate change impacts.	▪ Continue to monitor and manage climate change impact.

Maps

Map 1:

Legend

Client: City of Melville
04/04/2024



Map 2:
Vegetation Type

Lake Booragoon Reserve, City of Melville

Legend

- ErMrW
- MrMtW
- Open Water
- Parkland
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	04/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

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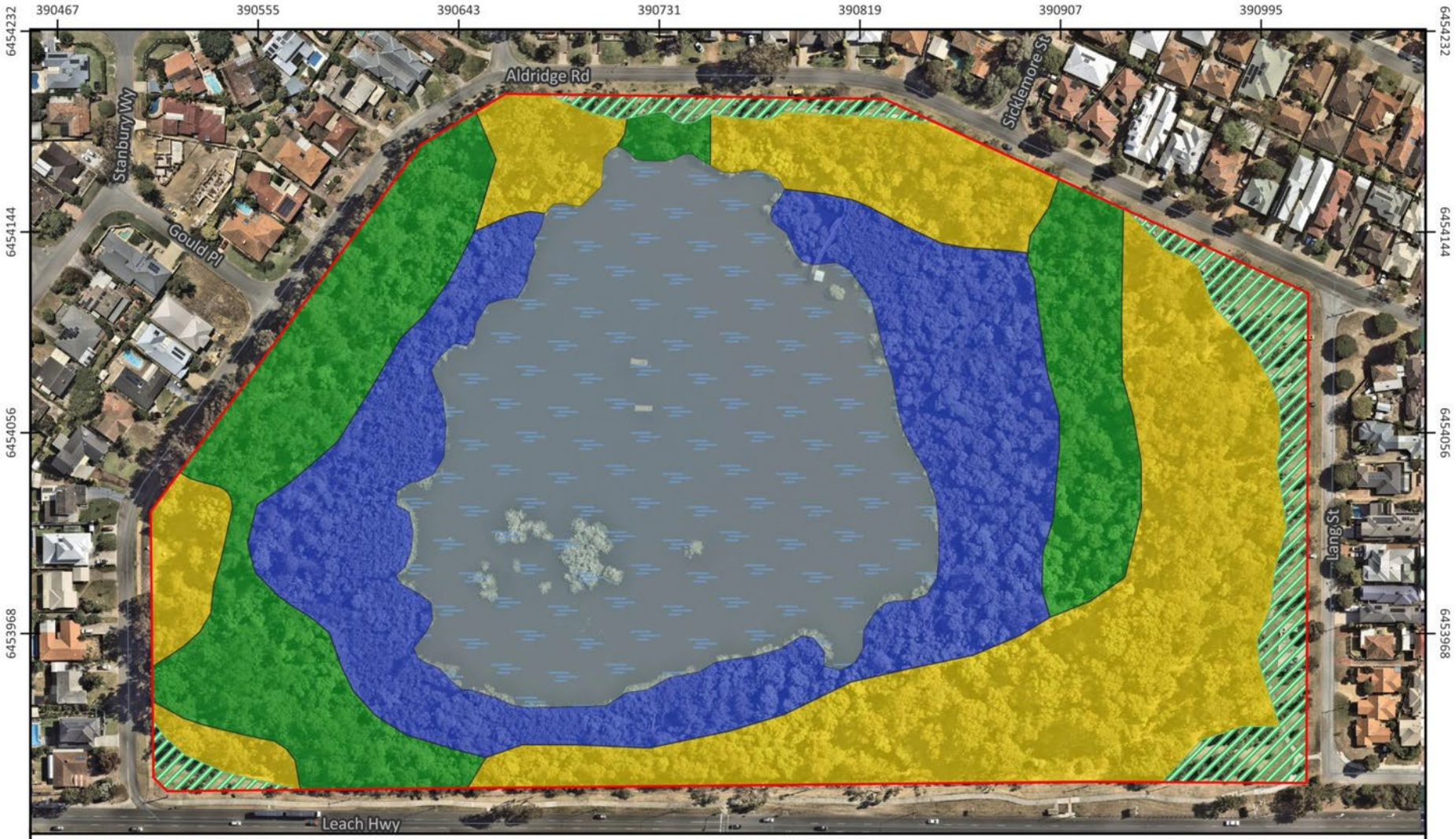

Map 3:
Vegetation Condition

Lake Booragoon Reserve, City of Melville

Legend

- Very Good
- Good
- Degraded
- Water
- Parkland
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	04/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

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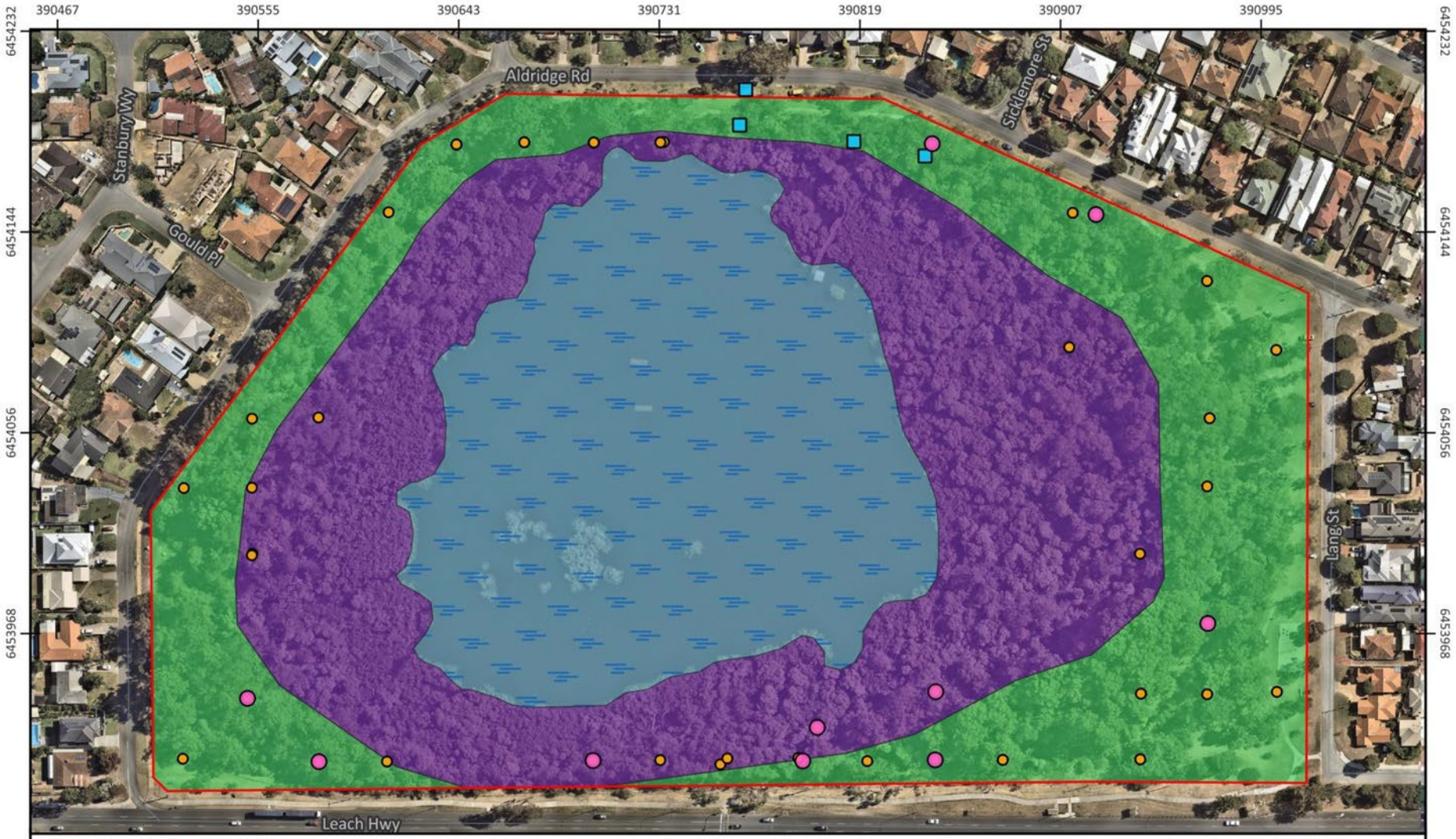

Map 4:
Fauna Habitat

Lake Booragoon Reserve, City of Melville

Legend

- Booragoon and Blue Gum Nestbox
- Potential Habitat Trees
- Potential Habitat Trees with Hollows
- Eucalyptus Woodland
- Paperbark Woodland
- Open Water
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N

Map 5:
Physical Disturbances

Lake Booragoon Reserve, City of Melville

Legend

- Rubbish
- Unmarked Pathway
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

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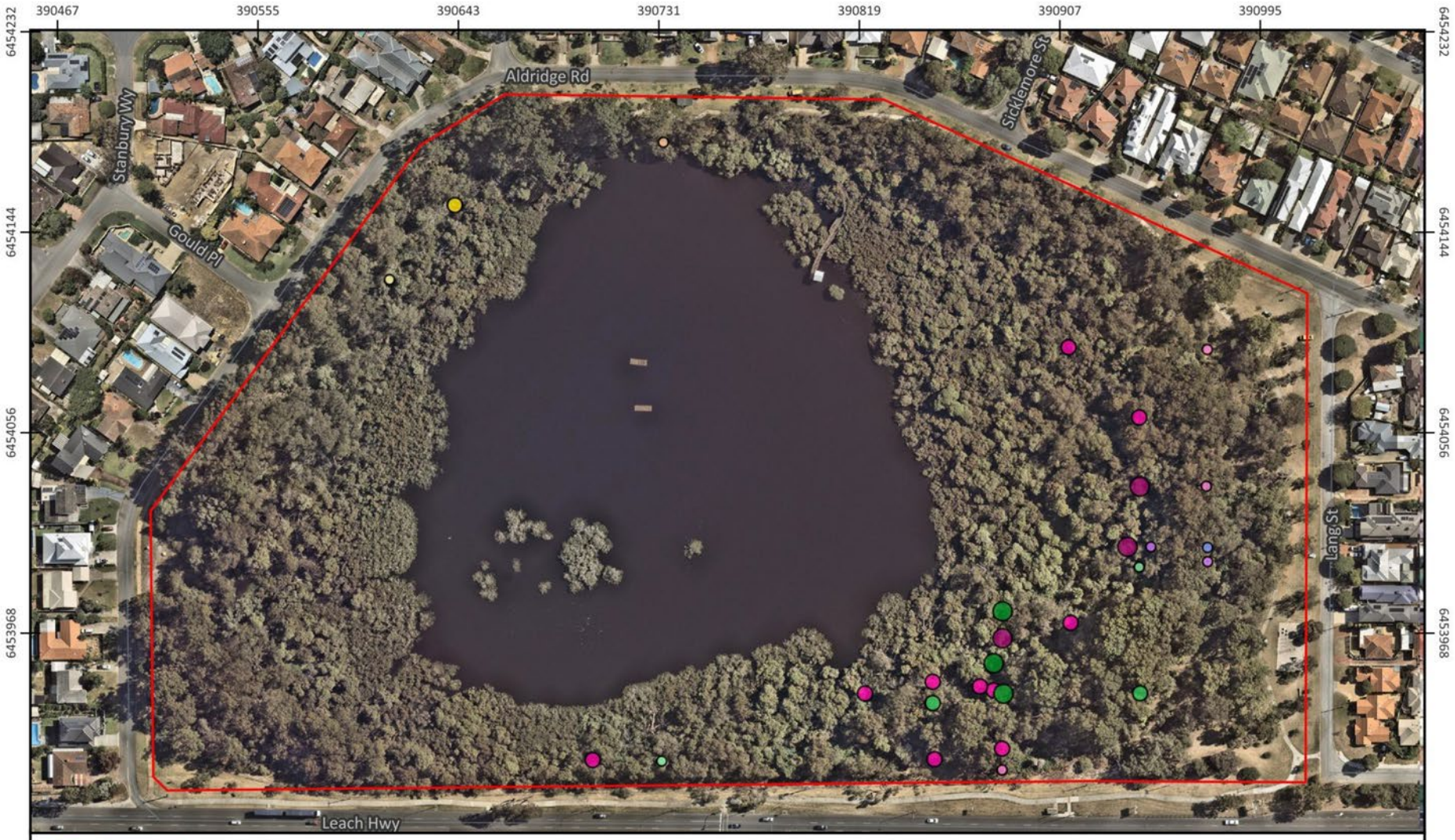

Map 6:
Very High Weeds

Lake Booragoon Reserve, City of Melville

Legend

- Anredera cordifolia (<5)
- Anredera cordifolia (>25)
- Anredera cordifolia (5-25)
- Asparagus asparagoides (<5)
- Cuscuta campestris (<5)
- Cuscuta campestris (5-25)
- Ehrharta calycina (<5)
- Schinus terebinthifolia (<5)
- Schinus terebinthifolia (>25)
- Schinus terebinthifolia (5-25)
- Zantedeschia aethiopica (<5)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

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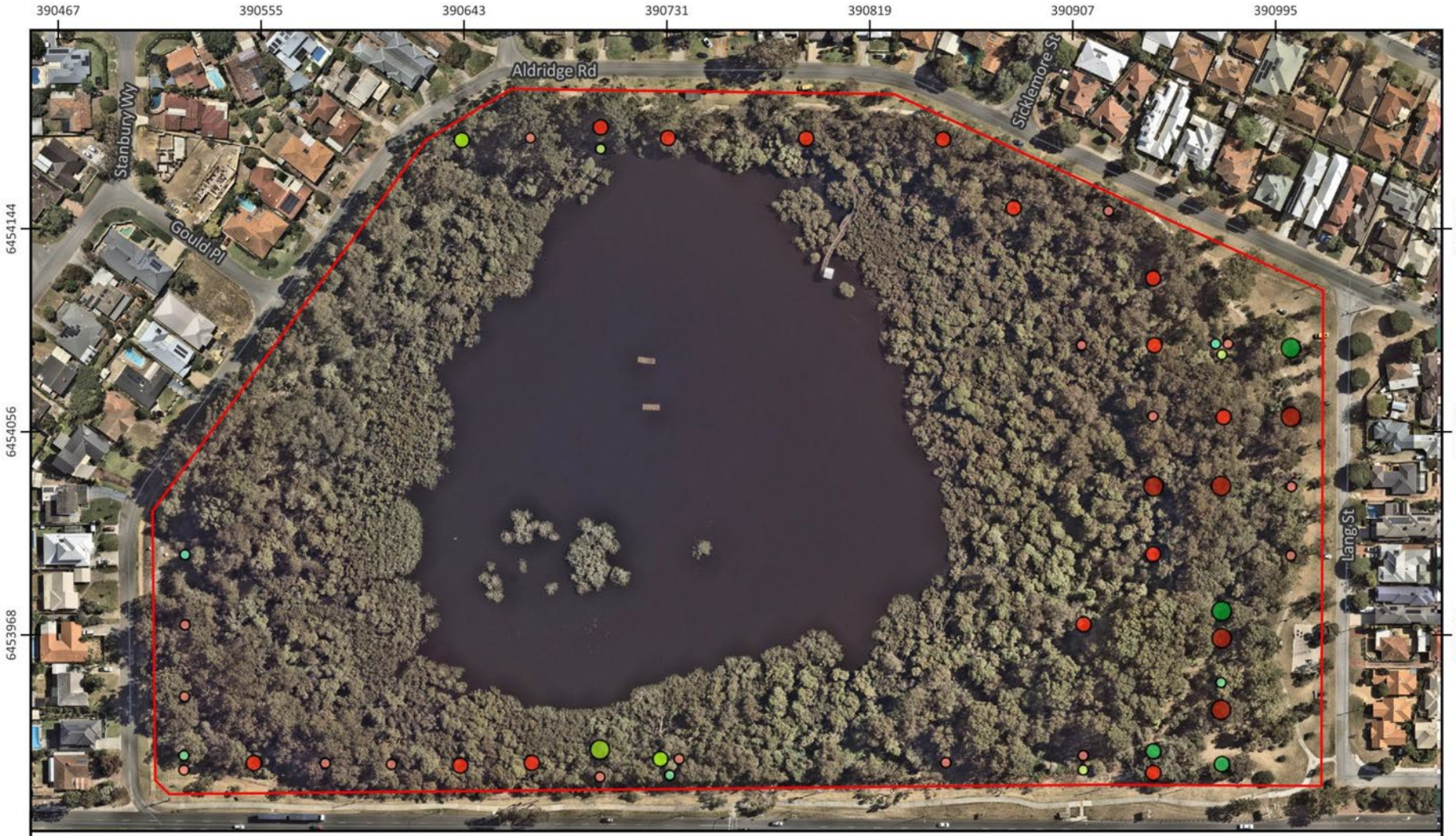


Map 7:
High Grass Weeds

Lake Booragoon Reserve, City of Melville

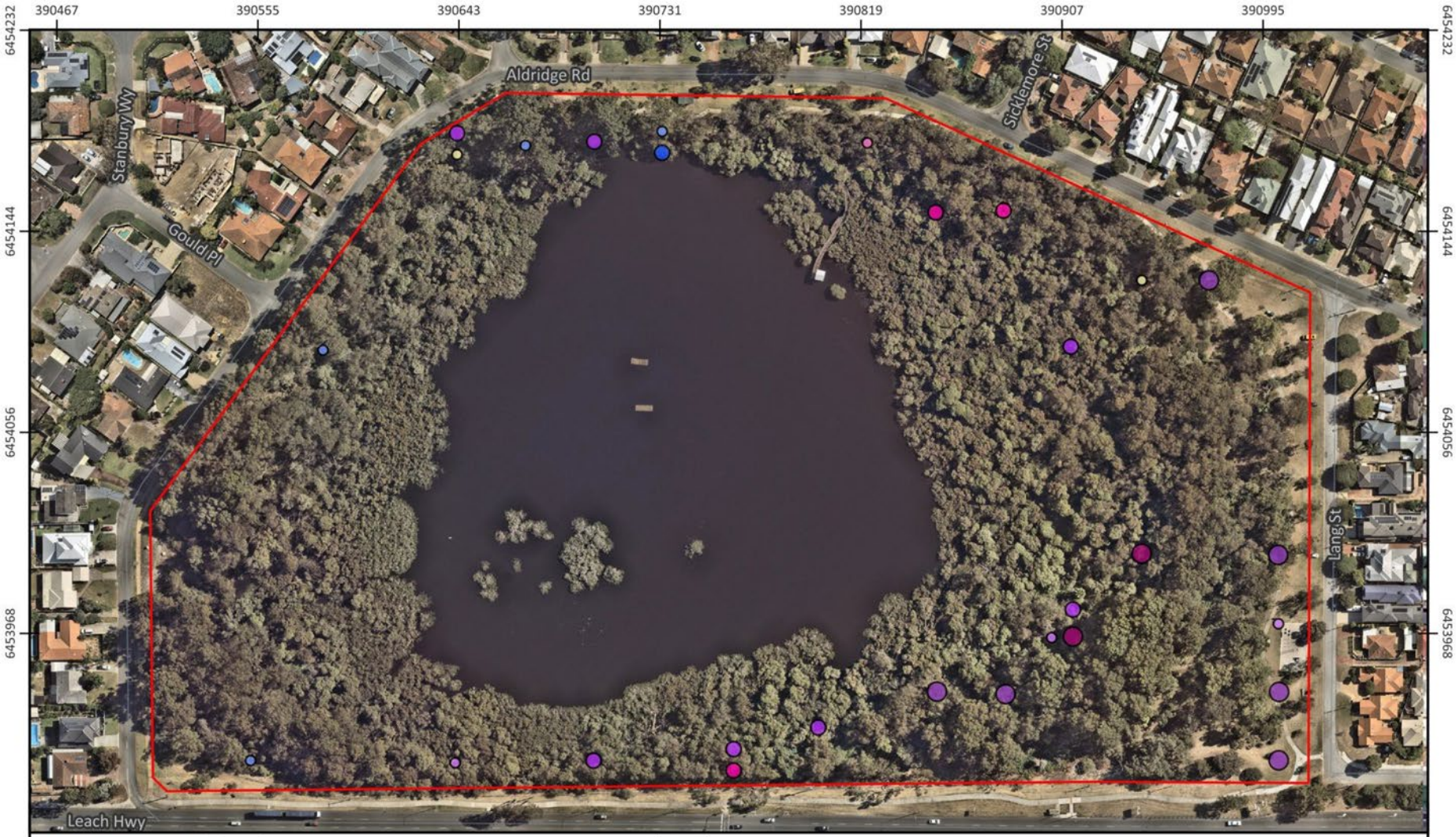
Legend

- Ehrharta longiflora (<5)
- Ehrharta longiflora (>25)
- Ehrharta longiflora (5-25)
- Hordeum leporinum (<5)
- Hordeum leporinum (>25)
- Hordeum leporinum (5-25)
- Lagurus ovatus (<5)
- Lolium rigidum (<5)
- Lolium rigidum (>25)
- Lolium rigidum (5-25)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N



Map 8:
High Grass Weeds

Lake Booragoon Reserve, City of Melville

Legend

- Avena barbata (<5)
- Bromus diandrus (<5)
- Bromus diandrus (5-25)
- Cenchrus clandestinus (<5)
- Cenchrus clandestinus (5-25)
- Cenchrus clandestinus (>25)
- Cynodon dactylon (<5)
- Cynodon dactylon (5-25)
- Cynodon dactylon (>25)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N

Map 9:
High Bulb Weeds

Lake Booragoon Reserve, City of Melville

Legend

- Freesia leichtlinii subsp. alba × leichtlinii subsp. leichtlinii (<5)
- Watsonia meriana var. bulbilifera (5-25)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N


390467
390555
390643
390731
390819
390907
390995
6454144
6454056
6453968
Aldridge Rd
Stanbury Wy
Gould Pl
Sicklemore St
Lang St
Map 10:
High Woody Weeds
Lake Booragoon Reserve, City of Melville
Legend
Acacia baileyana (5-25)
Brachychiton populneus (<5)
Callistemon sp. (<5)
Cinnamomum camphora (<5)
Casuarina cunninghamiana (<5)
Casuarina cunninghamiana (>25)
Eucalyptus grandis (>25)
Phoenix dactylifera (5-25)
Phoenix dactylifera (>25)
Melaleuca quinquenervia (<5)
Homalanthus populifolius (5-25)
Ricinus communis (>25)
Washingtonia filifera (>25)
Opuntia stricta (<5)
Ficus carica (<5)
Ficus carica (5-25)
Ficus carica (>25)
Booragoon Lake Reserve Boundary
Client: City of Melville
Date: 08/04/2024
Created by: Z. Stoney
Image Source: Nearmap, 2024
Datum: GDA2020 / MGA zone 50
Scale: 1: 2200
0 25 50 m
N

Map 11:
High Other Weeds

Lake Booragoon Reserve, City of Melville

Legend

- Atriplex prostrata (<5)
- Atriplex prostrata (5-25)
- Cyperus rotundus (<5)
- Cyperus rotundus (5-25)
- Malva parviflora (<5)
- Pelargonium capitatum (<5)
- Polypogon monspeliensis (<5)
- Solanum nigrum (<5)
- Solanum nigrum (5-25)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N

Map 12:
Medium Weeds

Lake Booragoon Reserve, City of Melville

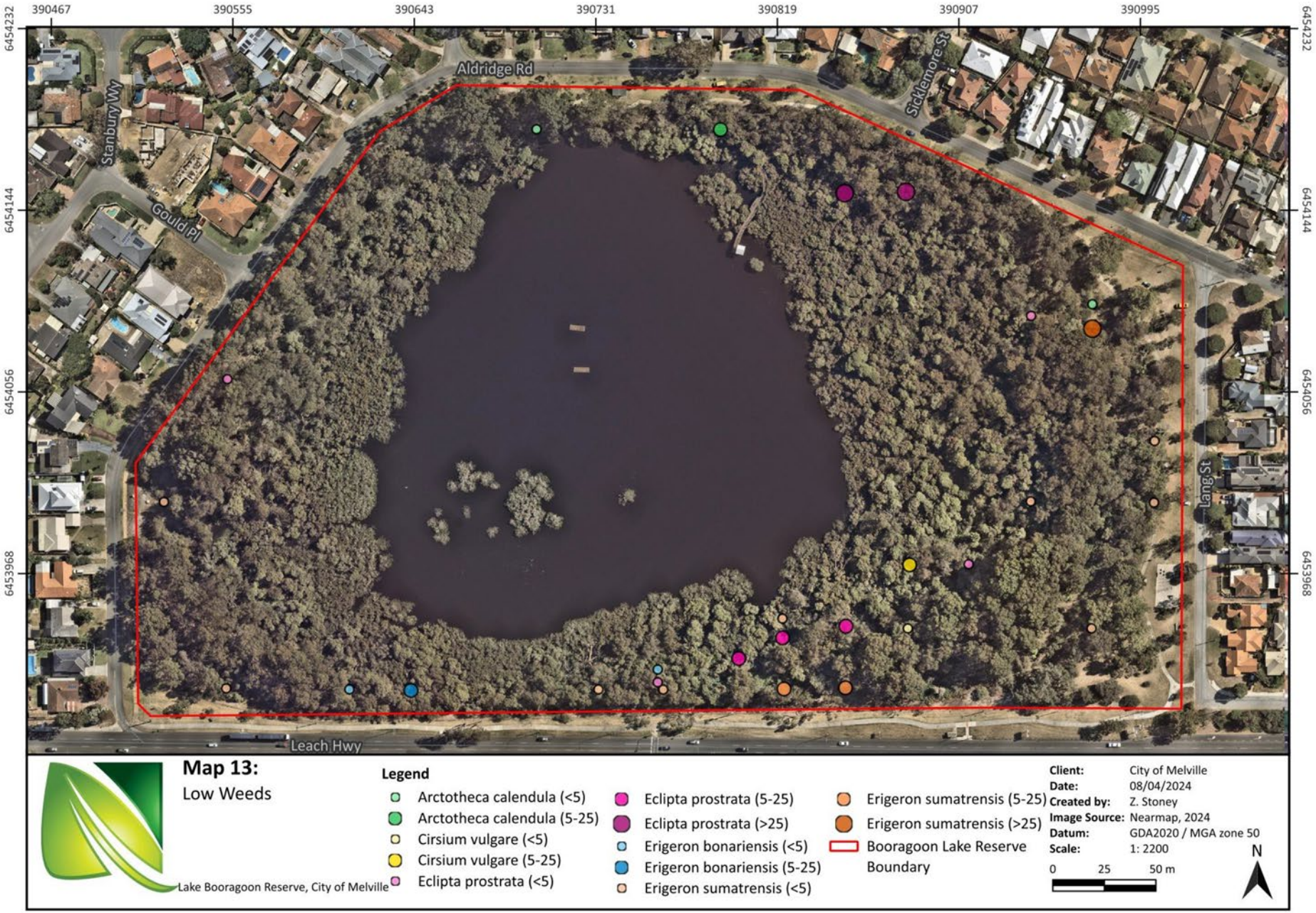
Legend

- Parthenocissus quinquefolia (<5)
- Phytolacca octandra (<5)
- Rumex acetosella (<5)
- Rumex crispus (<5)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N



Map 13:
Low Weeds

Lake Booragoon Reserve, City of Melville

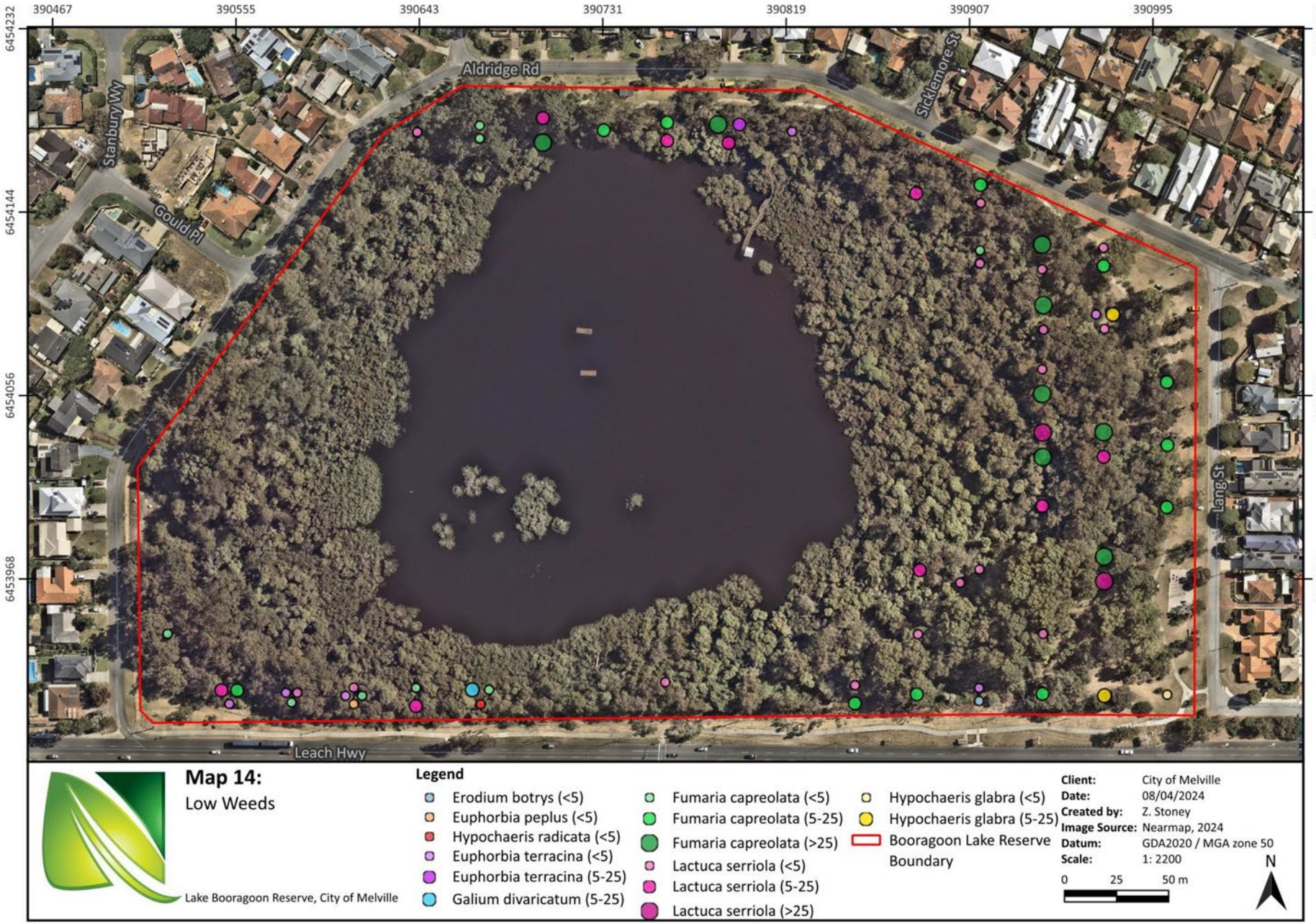
Legend

- Arctotheca calendula (<5)
- Arctotheca calendula (5-25)
- Cirsium vulgare (<5)
- Cirsium vulgare (5-25)
- Eclipta prostrata (<5)
- Eclipta prostrata (5-25)
- Eclipta prostrata (>25)
- Erigeron bonariensis (<5)
- Erigeron bonariensis (5-25)
- Erigeron sumatrensis (<5)
- Erigeron sumatrensis (5-25)
- Erigeron sumatrensis (>25)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N



Map 14:
Low Weeds

Lake Booragoon Reserve, City of Melville

Legend

- Erodium botrys (<5)
- Euphorbia peplus (<5)
- Hypochaeris radicata (<5)
- Euphorbia terracina (<5)
- Euphorbia terracina (5-25)
- Galium divaricatum (5-25)
- Fumaria capreolata (<5)
- Fumaria capreolata (5-25)
- Fumaria capreolata (>25)
- Lactuca serriola (<5)
- Lactuca serriola (5-25)
- Lactuca serriola (>25)
- Hypochaeris glabra (<5)
- Hypochaeris glabra (5-25)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N

Map 15:
Low Weeds

Lake Booragoon Reserve, City of Melville

Legend

- Lysimachia arvensis (<5)
- Oxalis pes-caprae (<5)
- Polygonum aviculare (<5)
- Pseudognaphalium luteoalbum (5-25)
- Sonchus asper (<5)
- Sonchus oleraceus (<5)
- Sonchus oleraceus (5-25)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N

Map 16:
Low Weeds

Lake Booragoon Reserve, City of Melville

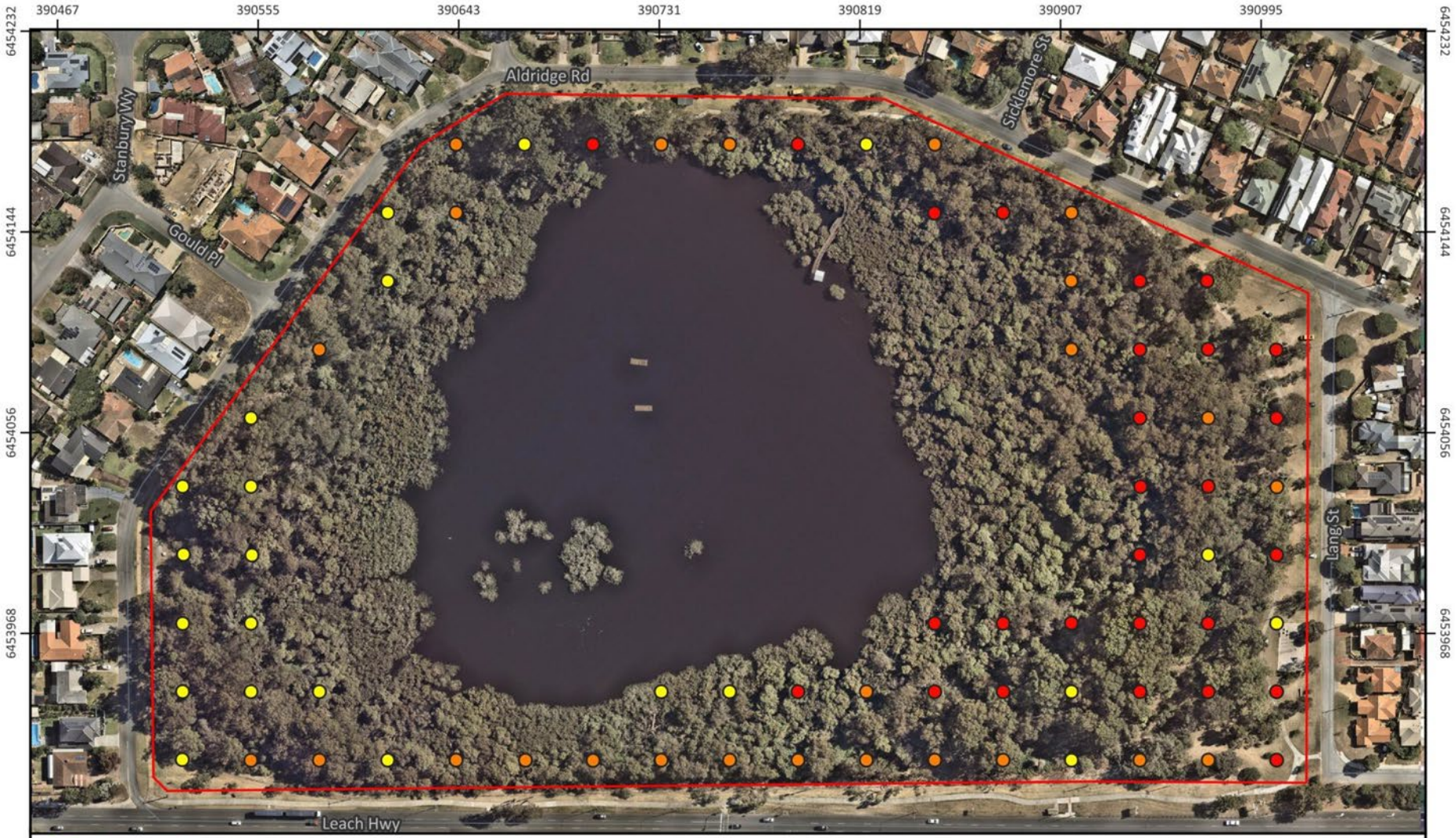
Legend

- Stellaria media (<5)
- Stellaria media (>25)
- Stellaria media (5-25)
- Stenotaphrum secundatum (<5)
- Stenotaphrum secundatum (>25)
- Stenotaphrum secundatum (5-25)
- Symphyotrichum squamatum (<5)
- Trifolium campestre (<5)
- Urospermum picroides (<5)
- Urospermum picroides (5-25)
- Vicia sativa (<5)
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N



Map 17:
Combined Weed Density

Lake Booragoon Reserve, City of Melville

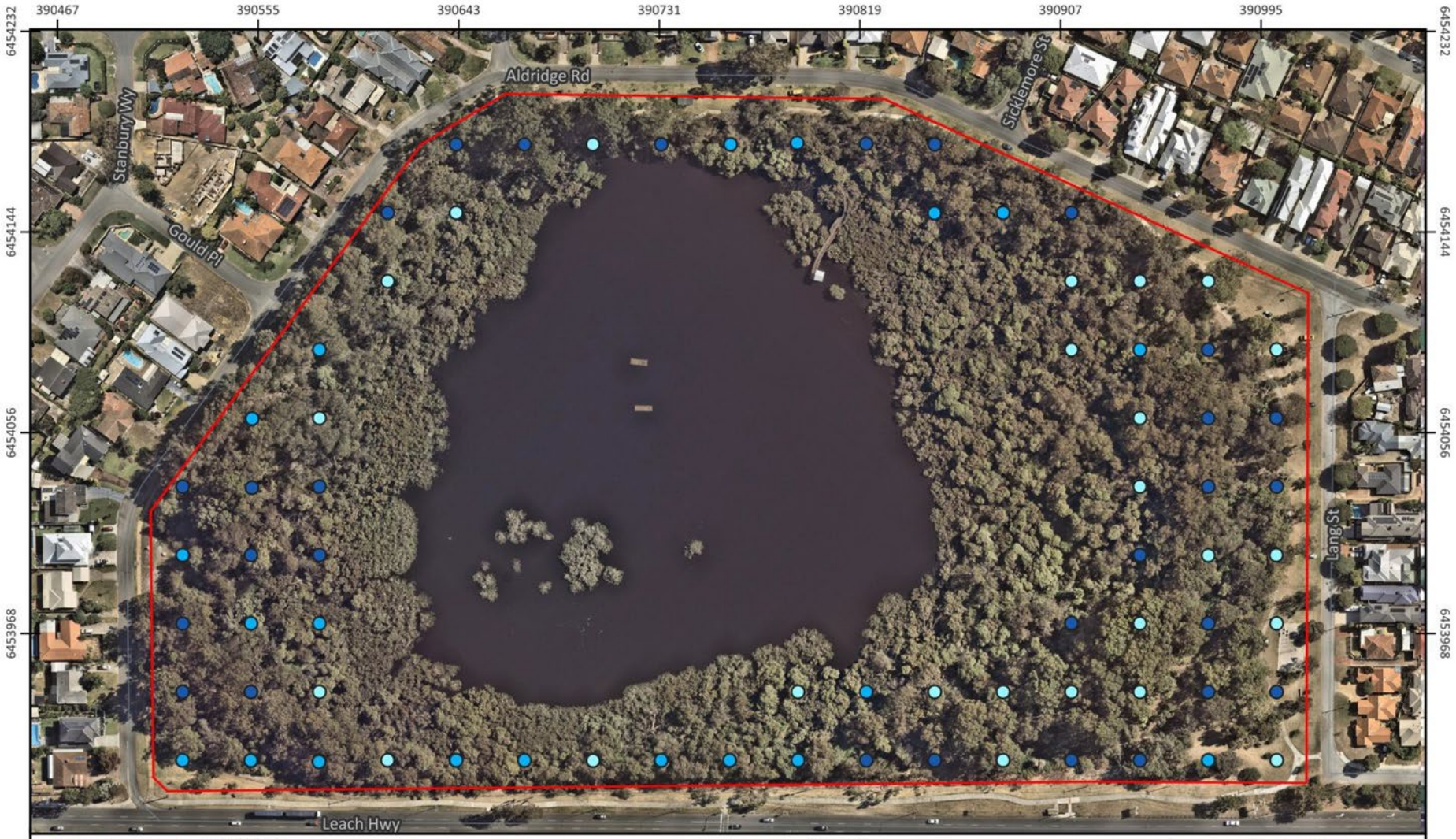
Legend

- <5
- 5-25
- >25
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N



Map 18:
Bare Ground

Lake Booragoon Reserve, City of Melville

Legend

- <5
- 5-25
- >25
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	08/04/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N

Map 19:
Priority Areas for Revegetation

Lake Booragoon Reserve, City of Melville

Legend

- Proposed Revegetation Areas
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	27/06/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N

Map 20:
Location of European Bees

Lake Booragoon Reserve, City of Melville

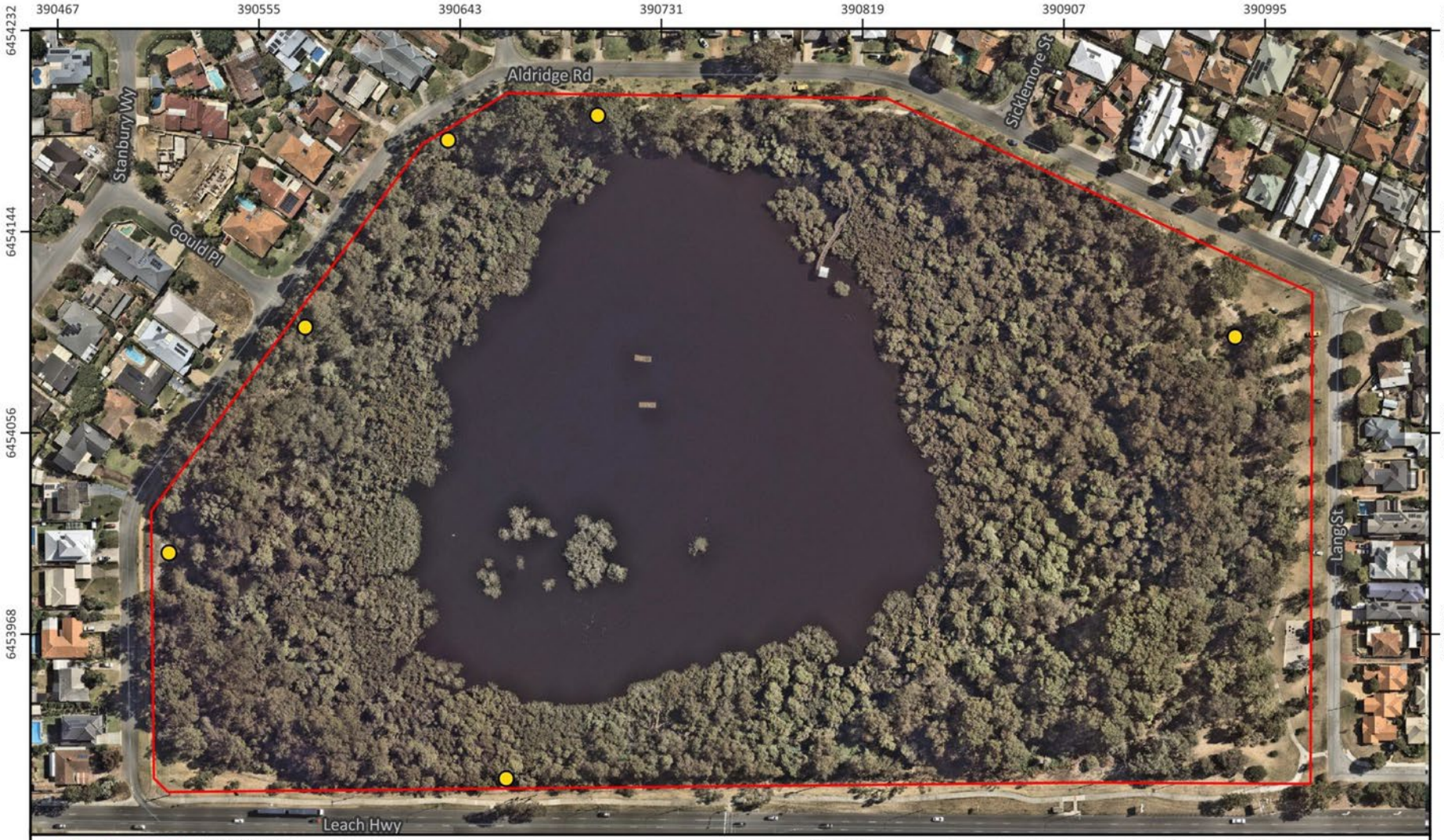
Legend

- European Beehive
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	27/06/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N



Map 21:
Stormwater Drains

Lake Booragoon Reserve, City of Melville

Legend

- Stormwater Drains
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	27/06/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

0 25 50 m

N

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Appendix 1 Survey Methodology

Natural Area Consulting Management Services (Natural Area) was contracted by City of Melville to undertake a basic flora survey, a detailed fauna survey and weed mapping across Booragoon Lake Reserve.

On-ground 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 species to enable later identification.

Natural Area environmental scientists undertook the survey between October 19 and 20, 2023, with key data recorded using Mappt software on a handheld tablet. Survey activities included:

- traversing the entirety of the site in grid format
- recording all species present, including native and invasive species
- recording the weed species and cover present at each grid point
- recording the percentage of bare ground
- marking locations of any conservation significant flora, declared pests (DP) and/or Weeds of National Significance (WoNS) identified
- recording vegetation type including dominant over, middle and understorey species and condition using the scale attributed to Keighery (Table 38)
- the use of GPS to map significant species and boundaries of differing vegetation type and condition
- recording evidence of disturbance, such as fire.

Vegetation Type

The vegetation type was determined using the structural classes described in NVIS Level V (Executive Steering Committee for Australian Vegetation Information (ESCAVI), 2003), recording dominant over, middle and understorey species.

Vegetation Condition

Vegetation condition was assessed using the rating scale attributed to Keighery in *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) (Table 38). Table 38 provides a description of the rating scale.

Table 38: Vegetation condition ratings

Category		Description
1	Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
2	Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
3	Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds, partial clearing, dieback and grazing.

Category		Description
5	Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
6	Completely Degraded	The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Source: EPA, 2016

On-ground Fauna Survey

The fauna survey was conducted in accordance with a Detailed Fauna Survey as outlined in the *Technical Guidance, Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020). Natural Area environmental scientists undertook the survey between October 16 and 20, 2023, with survey activities including:

- trapping over five consecutive days (four nights) with trap-line and Elliott traps (Table 39)
- setting up three trap-lines which included pitfalls and funnel traps along a drift fence with vegetation used to cover funnel traps and placed in pitfall buckets to provide protection from the elements (Figure 4)
- setting up six Elliott traps with universal bait (oats and peanut butter), newspaper being placed inside for bedding and then traps were covered with a hessian bag or foliage to provide protection from the elements (Figure 4)
- all trap and trap line coordinates were recorded using a hand-help GPS and marked with flagging tape (GPS coordinates are provided in Table 40 and displayed in Map 22)
- checking traps daily within three hours of sunrise as per Department of Biodiversity, Conservation and Attractions (DBCA) licence conditions, along with recording and releasing captured species back into the site
- active searching included searching under logs, rocks and hand raking through leaf litter
- static bird census was undertaken during trapping events with five-minute census undertaken at each trap line location recording visual observations of birds and calls heard
- walking the site to record opportunistic sightings or signs of birds and larger mammals, including calls, tracks, diggings, and scats
- undertaking two nocturnal surveys recording fauna using a combination of thermal imaging, spotlighting and an acoustic recorder
- recording the outcomes of the trapping and observation activities.

Table 39: Total trap nights

Number of Traps	Number of Nights	Number of Trap nights
Six Funnels (Trapline)	Four	24
Nine Pitfalls (Trapline)		36
Six Elliots		24
		Total: 36

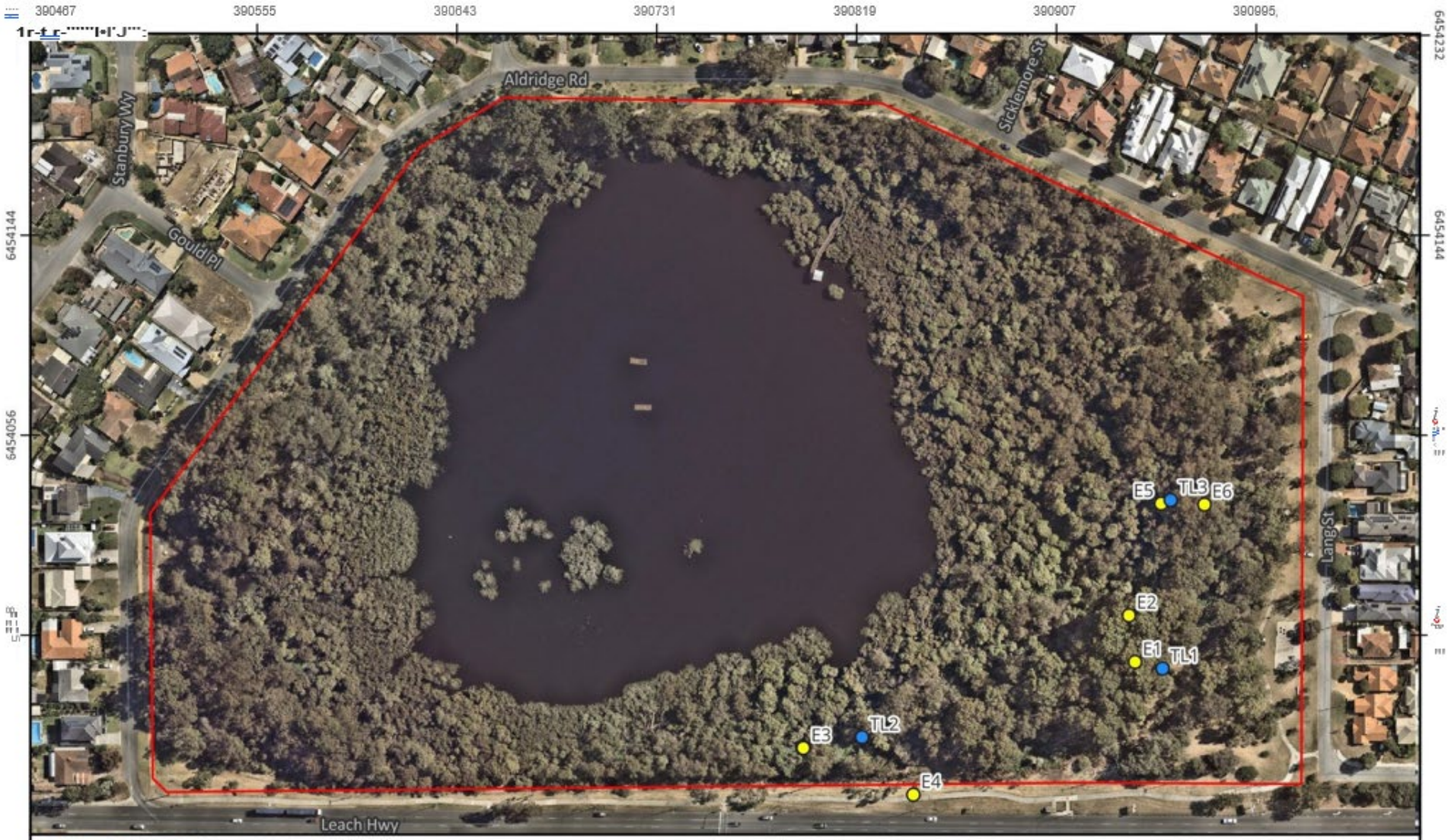
Figure 4: Trap line (left) and Elliot trap (right).

Weather Conditions

Local weather conditions can affect fauna activity, with low temperatures and rain likely to reduce mammals and reptile activity, which was the case in this survey. The trapping period experienced cool and cloudy mornings, temperatures during the trapping period ranged between 11.2 °C and 36.9 °C. Rainfall during the trapping period was recorded at 0 mm according to the Perth Airport Weather Station ID:009022 (Bureau of Meteorology, 2024).

Table 40: Fauna trapping locations provided as GPS Coordinates

ID	Type	Northing	Easting
E1	Elliot Trap	6453956	390941
E2	Elliot Trap	6453977	390939
E3	Elliot Trap	6453918	390795
E4	Elliot Trap	6453898	390844
E5	Elliot Trap	6454026	390953
E6	Elliot Trap	6454025	390972
TL1	Trap Line	6453953	390954
TL2	Trap Line	6453923	390821
TL3	Trap Line	6454027	390957



Map 22:
Trap Locations

Lake Booragoon Reserve, City of Melville

Legend

- 0 Elliott
- Trap Line
- Booragoon Lake Reserve Boundary

Client:	City of Melville
Date:	02/07/2024
Created by:	Z. Stoney
Image Source:	Nearmap, 2024
Datum:	GDA2020 / MGA zone 50
Scale:	1: 2200

N

0 25 50m

A

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

Conservation Code	Name	Description
		consideration can be given to their declaration as threatened fauna or 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, 2020a)

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 Species List (Flora)

Native flora species identified within the reserve are listed below by family.

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Amaranthaceae	*Alternanthera nodiflora*	Common Joyweed	X		
Apiaceae	*Centella asiatica*	Centella	X	X	X
Apiaceae	*Xanthosia huegelii*			X	
Araceae	*Lemna disperma*	Duckweed	X	X	X
Asparagaceae	*Sowerbaea laxiflora*	Purple Tassels	X		
Asteraceae	*Cotula australis*	Common Cotula			X
Campanulaceae	*Lobelia anceps*	Angled Lobelia	X		X
Casuarinaceae	*Allocasuarina fraseriana*	Sheoak			X
Casuarinaceae	*Allocasuarina humilis*	Dwarf Sheoak		X	X
Chenopodiaceae	*Rhagodia baccata*	Berry Saltbush			X
Colchicaceae	*Burchardia congesta*	Milkmaids	X		
Cyperaceae	*Gahnia trifida*	Coast Saw-sedge			X
Cyperaceae	*Isolepis cernua*	Nodding Club-rush			X
Cyperaceae	*Lepidosperma gladiatum*	Coast Sword-sedge			X
Cyperaceae	*Machaerina juncea*	Bare Twigrush	X		X
Cyperaceae	*Machaerina preissii*		X		X
Cyperaceae	*Lepidosperma longitudinale*	Pithy Sword-sedge	X	X	X
Cyperaceae	*Machaerina articulata*	Jointed Rush	X	X	X

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Cyperaceae	*Bolboschoenus caldwellii*	Marsh Club-rush	X		
Cyperaceae	*Isolepis congrua*			X	
Cyperaceae	*Schoenoplectus tabernaemontani*	Lake Club-rush	X		
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	X	X	X
Dilleniaceae	*Hibbertia cuneiformis*	Cutleaf Hibbertia			X
Dilleniaceae	*Hibbertia hypericoides*	Yellow Buttercups			X
Ericaceae	*Styphelia propinqua*		X		
Fabaceae	*Acacia pulchella*	Prickly Moses	X	X	X
Fabaceae	*Acacia saligna*	Orange Wattle	X	X	X
Fabaceae	*Acacia stenoptera*	Narrow Winged Wattle		X	
Fabaceae	*Bossiaea eriocarpa*	Common Brown Pea		X	X
Fabaceae	*Gastrolobium ebracteolatum*		X		X
Fabaceae	*Gompholobium tomentosum*	Hairy Yellow Pea			X
Fabaceae	*Hardenbergia comptoniana*	Native Wisteria	X	X	X
Fabaceae	*Jacksonia furcellata*	Grey Stinkwood	X	X	X
Fabaceae	*Jacksonia sternbergiana*	Stinkwood	X	X	X
Fabaceae	*Kennedia prostrata*	Scarlet Runner	X	X	X
Fabaceae	*Viminaria juncea*	Swishbush		X	X
Haemodoraceae	*Conostylis aculeata*	Prickly Conostylis			X
Haemodoraceae	*Haemodorum spicatum*	Bohn	X		

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Hemerocallidaceae	*Dianella revoluta*	Blueberry Lily	X		X
Hemerocallidaceae	*Tricoryne elatior*	Yellow Autumn Lily	X		
Iridaceae	*Patersonia occidentalis*	Purple Flag			X
Iridaceae	*Patersonia juncea*	Rush Leaved Patersonia	X		
Juncaceae	*Juncus pallidus*	Pale Rush	X	X	X
Juncaceae	*Juncus subsecundus*	Finger Rush			X
Lamiaceae	*Hemiandra pungens*	Snakebush			X
Lauraceae	*Cassytha racemosa*	Dodder Laurel	X		X
Loranthaceae	*Nuytsia floribunda*	Christmas Tree	X		
Myrtaceae	*Agonis flexuosa*	Peppermint			X
Myrtaceae	*Astartea scoparia*	Common Astartea	X	X	X
Myrtaceae	*Calothamnus quadrifidus*	One-sided Bottlebrush			X
Myrtaceae	*Corymbia calophylla*	Marri			X
Myrtaceae	*Eucalyptus gomphocephala*	Tuart			X
Myrtaceae	*Eucalyptus rudis*	Flooded Gum	X	X	X
Myrtaceae	*Hypocalymma angustifolium*	White Myrtle			X
Myrtaceae	*Hypocalymma robustum*	Swan River Myrtle		X	X
Myrtaceae	*Kunzea glabrescens*	Spearwood		X	X
Myrtaceae	*Melaleuca huegelii*	Chenille Honeymyrtle			X
Myrtaceae	*Melaleuca preissiana*	Moonah	X	X	X

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Myrtaceae	*Melaleuca radula*	Graceful Honeymyrtle			X
Myrtaceae	*Melaleuca rhaphiophylla*	Swamp Paperbark	X	X	X
Myrtaceae	*Melaleuca seriata*				X
Myrtaceae	*Melaleuca systena*	Coastal Honeymyrtle			X
Myrtaceae	*Melaleuca teretifolia*	Banbar	X	X	X
Myrtaceae	*Melaleuca viminea*	Mohan			X
Myrtaceae	*Regelia ciliata*				X
Myrtaceae	*Regelia inops*				X
Myrtaceae	*Scholtzia teretifolia*			X	
Orchidaceae	*Microtis media*	Tall Mignonette Orchid	X		X
Polygonaceae	*Muehlenbeckia adpressa*	Climbing Lignum			X
Polygonaceae	*Persicaria decipiens*		X		
Proteaceae	*Banksia grandis*	Bull Banksia		X	X
Proteaceae	*Banksia littoralis*	Swamp Banksia	X	X	X
Proteaceae	*Banksia nivea*	Honeypot Dryandra			X
Proteaceae	*Banksia prionotes*	Acorn Banksia			X
Proteaceae	*Hakea prostrata*	Harsh Hakea	X	X	X
Proteaceae	*Hakea varia*	Variable-leaved Hakea	X		X
Proteaceae	*Adenanthos cygnorum subsp. Cygnorum*	Common Woollybush	X		
Proteaceae	*Banksia attenuata*	Slender Banksia	X		

amily	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
roteaceae	*Banksia menziesii*	Firewood Banksia	X	X	
roteaceae	*Synaphea spinulosa subsp. Spinulosa*			X	
apindaceae	*Dodonaea sp.*		X		
hymelaeaceae	*Pimelea rosea*	Rose Banjine	X		X
yphaceae	*Typha domingensis*	Bulrush	X		
yphaceae	*Typha orientalis*	Bulrush	X	X	
anthorrhoeaceae	*Xanthorrhoea brunonis*				X
anthorrhoeaceae	*Xanthorrhoea preissii*	Grass tree	X	X	X
amiaceae	*Macrozamia fraseri*		X	X	X

Appendix 4 Species List (Fauna)

Fauna species recorded across the reserve are listed below by family. Species highlighted in red are declared pests and those that are highlighted in green are conservation significant species.

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2019 Management Plan (Community)	2024 Management Plan	2024 Management Plan (eDNA)
Amphibian							
Limnodynastidae	*Heleioporus eyrei*	Moaning Frog	X	X		X	
Limnodynastidae	*Limnodynastes dorsalis*	Western Banjo Frog	X	X		X	X
Myobatrachidae	*Crinia georgiana*	Quacking Frog				X	
Myobatrachidae	*Pseudophryne guentheri*	Crawling Toadlet					X
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog		X		X	
Pelodryadidae	*Litoria cyclorhyncha*	Spotted-thighed Frog					X
Bird							
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill (Broad-tailed Thornbill)	X				
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	X				
Acanthizidae	*Acanthiza inornata*	Western Thornbill	X		X		
Acanthizidae	*Gerygone fusca*	Western Gerygone	X		X		
Acanthizidae	*Smicrornis brevirostris*	Weebill	X	X	X		
Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk	X		X		
Accipitridae	*Accipiter fasciatus*	Brown Goshawk	X		X		
Accipitridae	*Circus approximans*	Swamp Harrier	X		X		

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2019 Management Plan (Community)	2024 Management Plan	2024 Management Plan (eDNA)
Accipitridae	*Elanus axillaris*	Black-shouldered Kite	X		X		
Accipitridae	*Haliastur sphenurus*	Whistling Kite	X		X		
Accipitridae	*Lophoictinia isura*	Square-tailed Kite			X		
Acrocephalidae	*Acrocephalus australis*	Australian Reed Warbler	X		X		
Alcedinidae	**Dacelo novaeguineae*	Laughing Kookaburra				X	
Alcedinidae	*Todiramphus sanctus*	Sacred Kingfisher	X		X		
Anatidae	**Anas platyrhynchos*	Mallard	X				X
Anatidae	*Anas castanea*	Chestnut Teal	X				
Anatidae	*Anas gracilis*	Grey Teal	X	X	X		X
Anatidae	*Anas superciliosa*	Pacific Black Duck	X	X	X	X	
Anatidae	*Aythya australis*	Hardhead	X	X	X		
Anatidae	*Biziura lobata*	Musk Duck	X				
Anatidae	*Chenonetta jubata*	Australian Wood Duck (Wood Duck, Maned Duck)	X	X	X		
Anatidae	*Cygnus atratus*	Black Swan	X	X	X	X	
Anatidae	*Dendrocygna arcuata*	Wandering Whistling Duck (Chestnut Whistling Duck)	X				
Anatidae	*Malacorhynchus membranaceus*	Pink-eared Duck	X	X	X	X	
Anatidae	*Oxyura australis*	Blue-billed Duck	X	X	X	X	X
Anatidae	*Spatula rhynchotis*	Australasian Shoveler	X		X		
Anatidae	*Tadorna tadornoides*	Australian Shelduck (Mountain Duck)	X		X		

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2019 Management Plan (Community)	2024 Management Plan	2024 Management Plan (eDNA)
Anhingidae	*Anhinga novaehollandiae*	Australasian Darter	X		X		
Ardeidae	*Ardea alba modesta*	Great Egret (Eastern Great Egret)	X		X		
Ardeidae	*Ardea garzetta*	Little Egret	X				
Ardeidae	*Ardea intermedia*	Intermediate Egret			X		
Ardeidae	*Ardea pacifica*	White-necked Heron	X		X		
Ardeidae	*Egretta garzetta*	Little Egret			X		
Ardeidae	*Egretta novaehollandiae*	White-faced Heron	X		X		
Ardeidae	*Nycticorax caledonicus*	Nankeen Night Heron (Rufous Night Heron)	X	X	X		
Ardeidae	*Ardea ibis*	Cattle Egret			X		
Artamidae	*Cracticus tibicen*	Grey Butcherbird	X	X	X		
Artamidae	*Gymnorhina tibicen*	Australian Magpie	X		X	X	
Artamidae	*Strepera versicolor*	Grey Currawong			X		
Cacatuidae	*Cacatua pastinator*	Western Long-billed Corella			X		
Cacatuidae	*Cacatua sanguinea*	Little Corella			X		
Cacatuidae	*Cacatua tenuirostris*	Eastern Long-billed Corella			X		
Cacatuidae	*Calyptorhynchus banksii*	Red-tailed Black Cockatoo			X		
Cacatuidae	*Calyptorhynchus baudinii*	Baudin's Black Cockatoo			X		
Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's Black Cockatoo	X		X		
Cacatuidae	*Eolophus roseicapilla*	Galah	X	X	X		

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2019 Management Plan (Community)	2024 Management Plan	2024 Management Plan (eDNA)
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	X		X		
Charadriidae	*Elseyornis melanops*	Black-fronted Dotterel	X		X		
Charadriidae	*Vanellus miles*	Masked Lapwing	X				
Columbidae	**Columba livia*	Domestic Pigeon (Rock Dove)	X				
Columbidae	**Spilopelia chinensis*	Spotted Turtle Dove		X	X	X	
Columbidae	**Spilopelia senegalensis*	Laughing Turtle Dove	X		X		
Columbidae	*Ocyphaps lophotes*	Crested Pigeon			X		
Corvidae	*Corvus coronoides*	Australian Raven	X	X	X	X	
Cuculidae	*Chrysococcyx lucidus*	Shining Bronze Cuckoo	X				
Cuculidae	*Heteroscenes pallidus*	Pallid Cuckoo	X				
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird	X		X		
Falconidae	*Falco berigora*	Brown Falcon	X				
Falconidae	*Falco cenchroides*	Australian Kestrel (Nankeen Kestrel)	X		X		
Falconidae	*Falco longipennis*	Australian Hobby	X		X		
Hirundinidae	*Hirundo neoxena*	Welcome Swallow	X		X		
Hirundinidae	*Petrochelidon nigricans*	Tree Martin	X		X		
Laridae	*Chroicocephalus novaehollandiae*	Silver Gull	X				
Maluridae	*Malurus splendens*	Splendid Fairywren		X	X		
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill	X				

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2019 Management Plan (Community)	2024 Management Plan	2024 Management Plan (eDNA)
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	X	X	X		
Meliphagidae	*Anthochaera lunulata*	Western Little Wattlebird (Western Wattlebird)	X		X		
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater	X		X		
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater	X	X	X	X	
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner	X				
Meliphagidae	*Phylidonyris niger*	White-cheeked Honeyeater	X		X		
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater	X		X	X	
Meropidae	*Merops ornatus*	Rainbow Bee-eater	X		X		
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	X		X		
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	X		X		
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote			X		
Pardalotidae	*Pardalotus striatus*	Striated Pardalote	X	X	X	X	
Pelecanidae	*Pelecanus conspicillatus*	Australian Pelican	X		X		
Phalacrocoracidae	*Microcarbo melanoleucos*	Little Pied Cormorant	X	X	X	X	X
Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant	X				
Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant	X	X	X		
Phalacrocoracidae	*Phalacrocorax varius*	Pied Cormorant (Australian Pied Cormorant)	X				
Podicipedidae	*Podiceps cristatus*	Great Crested Grebe	X				

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2019 Management Plan (Community)	2024 Management Plan	2024 Management Plan (eDNA)
Podicipedidae	*Poliocephalus poliocephalus*	Hoary-headed Grebe	X	X	X	X	
Podicipedidae	*Tachybaptus novaehollandiae*	Australasian Grebe (Black-throated Grebe)	X	X	X	X	
Psittaculidae	**Trichoglossus moluccanus*	Rainbow Lorikeet	X	X	X	X	
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	X		X		
Psittaculidae	*Purpureicephalus spurius*	Red-capped Parrot	X		X		
Rallidae	*Fulica atra*	Eurasian Coot	X	X	X	X	X
Rallidae	*Gallinula tenebrosa*	Dusky Moorhen		X			X
Rallidae	*Hypotaenidia philippensis*	Buff-banded Rail	X				
Rallidae	*Porphyrio melanotus*	Australasian Swamphen	X	X	X	X	
Rallidae	*Porzana fluminea*	Australian Spotted Crake (Australian Crake)	X				
Rallidae	*Zapornia pusilla*	Baillon's Crake	X				
Rallidae	*Zapornia tabuensis*	Spotless Crake	X				
Recurvirostridae	*Cladorhynchus leucocephalus*	Banded Stilt			X		
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	X		X		
Recurvirostridae	*Recurvirostra novaehollandiae*	Red-necked Avocet	X		X		
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	X	X	X		
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	X		X	X	
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	X				

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2019 Management Plan (Community)	2024 Management Plan	2024 Management Plan (eDNA)
Scolopacidae	*Tringa glareola*	Wood Sandpiper			X		
Scolopacidae	*Tringa nebularia*	Common Greenshank	X		X		
Threskiornithidae	*Platalea flavipes*	Yellow-billed Spoonbill	X		X		
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis			X		
Threskiornithidae	*Threskiornis molucca*	Australian White Ibis	X	X	X	X	
Threskiornithidae	*Threskiornis spinicollis*	Straw-necked Ibis	X		X		
Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye (Silvereye)	X	X	X	X	
Fish							
Blenniidae	*Parablennius yatabei*	Yatabe blenny					X
Gobiidae	*Arenigobius bifrenatus*	Bridled Goby					X
Gobiidae	*Arenigobius frenatus*	Halfbridled Goby					X
Paralichthyidae	*Pseudorhombus jenynsii*	Smalltooth Flounder					X
Poeciliidae	*Gambusia holbrooki*	Eastern Gambusia					X
Poeciliidae	*Xiphophorus hellerii*	Green swordtail					X
Scorpaenidae	*Gymnapistes marmoratus*	Soldier					X
Mammal							
Canidae	**Vulpes vulpes*	Red Fox	X				
Felidae	**Felis catus*	Cat	X	X			
Leporidae	**Oryctolagus cuniculus*	Rabbit	X				

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2019 Management Plan (Community)	2024 Management Plan	2024 Management Plan (eDNA)
Molossidae	*Austronomus australis*	White-striped Free-tailed Bat		X			
Muridae	**Mus musculus*	House Mouse				X	
Muridae	**Rattus rattus*	Black Rat		X			
Peramelidae	*Isoodon fusciventer*	Quenda		X			
Phalangeridae	*Trichosurus vulpecula*	Brushtail Possum				X	
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat		X			
Vespertilionidae	*Nyctophilus sp.*			X			
Vespertilionidae	*Vespadelus regulus*	Southern Forest Bat		X			
Reptile							
Chelidae	*Chelodina oblonga*	Oblong Turtle	X				
Scincidae	*Acritoscincus trilineatus*	Western Three-lined Skink	X	X		X	
Scincidae	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink		X		X	
Scincidae	*Cryptoblepharus virgatus*		X				
Scincidae	*Egernia kingii*	King's Skink		X			
Scincidae	*Hemiergis peronii*						X
Scincidae	*Hemiergis quadrilineata*	Two-toed Earless Skink		X		X	
Scincidae	*Tiliqua rugosa rugosa*	Bobtail				X	

Appendix 5 Species List (Weeds)

Weed species recorded across the reserve are listed below by family. Species highlighted in red are declared pests and / or WoNS.

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Aizoaceae	**Carpobrotus edulis*	Hottentot Fig	X		
Alliaceae	**Nothoscordum gracile*		X		
Anacardiaceae	**Schinus terebinthifolia*		X	X	X
Araceae	**Zantedeschia aethiopica*	Arum Lily	X	X	X
Arecaceae	**Phoenix dactylifera*	Date Palm		X	X
Arecaceae	**Washingtonia filifera*		X	X	X
Asparagaceae	**Asparagus asparagoides*	Bridal Creeper	X	X	X
Asteraceae	**Arctotheca calendula*	Cape Weed	X	X	X
Asteraceae	**Cirsium vulgare*	Spear Thistle			X
Asteraceae	**Eclipta prostrata*			X	X
Asteraceae	**Erigeron bonariensis*		X	X	X
Asteraceae	**Erigeron sumatrensis*				X
Asteraceae	**Hypochaeris glabra*	Smooth Cats-ear	X	X	X
Asteraceae	**Hypochaeris radicata*	Flat Weed			X
Asteraceae	**Lactuca serriola*	Prickly Lettuce	X	X	X
Asteraceae	**Pseudognaphalium luteoalbum*	Jersey Cudweed			X
Asteraceae	**Senecio condylus*	Perth Groundsel			X
Asteraceae	**Sonchus asper*	Rough Sowthistle			X

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Asteraceae	**Sonchus oleraceus*	Common Sowthistle	X	X	X
Asteraceae	**Symphyotrichum squamatum*	Bushy Starwort			X
Asteraceae	**Urospermum picroides*	False Hawkbit			X
Asteraceae	**Taraxacum khatoonae*	Dandelion		X	
Asteraceae	**Vellereophyton dealbatum*	White Cudweed	X		
Basellaceae	**Anredera cordifolia*		X	X	X
Brassicaceae	**Brassica tournefortii*	Mediterranean Turnip		X	
Brassicaceae	**Cardamine hirsuta*	Common Bittercress		X	
Brassicaceae	**Raphanus raphanistrum*	Wild Radish	X		
Cactaceae	**Opuntia stricta*	Common Prickly Pear			X
Caryophyllaceae	**Stellaria media*	Chickweed	X	X	X
Casuarinaceae	**Casuarina cunninghamiana*			X	X
Chenopodiaceae	**Atriplex prostrata*	Hastate Orache			X
Commelinaceae	**Commelina benghalensis*		X		
Commelinaceae	**Tradescantia fluminensis*		X		
Convolvulaceae	**Cuscuta campestris*	Golden dodder			X
Cyperaceae	**Cyperus rotundus*	Nut Grass	X		X
Cyperaceae	**Cyperus tenuiflorus*	Scaly Sedge	X	X	
Cyperaceae	**Cyperus eragrostis*	Umbrella Sedge	X		
Euphorbiaceae	**Euphorbia peplus*	Petty Spurge	X	X	X

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Euphorbiaceae	**Euphorbia terracina*	Geraldton Carnation Weed	X		X
Euphorbiaceae	**Homalanthus populifolius*				X
Euphorbiaceae	**Ricinus communis*	Castor Oil Plant	X		X
Euphorbiaceae	**Homalanthus novo-guineensis*		X		
Fabaceae	**Trifolium campestre*	Hop Clover			X
Fabaceae	**Vicia sativa*	Common Vetch			X
Fabaceae	**Acacia baileyana*			X	X
Fabaceae	**Acacia iteaphylla*			X	
Fabaceae	**Acacia podalyriifolia*		X		
Geraniaceae	**Erodium botrys*	Long Storksbill			X
Geraniaceae	**Pelargonium capitatum*	Rose Pelargonium	X	X	X
Geraniaceae	**Erodium moschatum*	Musky Crowfoot		X	
Iridaceae	**Freesia leichtlinii subsp. alba × leichtlinii subsp. leichtlinii*		X		X
Iridaceae	**Watsonia meriana var. bulbillifera*	Bulbil Watsonia	X		X
Iridaceae	**Chasmanthe floribunda*	African Cornflag	X	X	
Iridaceae	**Gladiolus caryophyllaceus*	Wild Gladiolus	X		
Iridaceae	**Moraea flaccida*	One-leaf Cape Tulip	X		
Lauraceae	**Cinnamomum camphora*				X
Malvaceae	**Brachychiton populneus*	Kurrajong		X	X
Malvaceae	**Malva parviflora*	Marshmallow			X

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Moraceae	**Ficus carica*	Common Fig	X	X	X
Myrtaceae	*#Melaleuca viminalis*				X
Myrtaceae	**Callistemon sp.*				X
Myrtaceae	**Eucalyptus grandis*				X
Myrtaceae	**Eucalyptus sp. Planted*			X	
Myrtaceae	**Melaleuca quinquenervia*		X	X	X
Onagraceae	**Oenothera drummondii*	Beach Evening Primrose	X		
Orobanchaceae	**Orobanche minor*	Lesser Broomrape		X	
Oxalidaceae	**Oxalis pes-caprae*	Soursob			X
Papaveraceae	**Fumaria capreolata*	Whiteflower Fumitory	X		X
Phytolaccaceae	**Phytolacca octandra*	Red Ink Plant	X		X
Poaceae	**Avena barbata*	Bearded Oat	X	X	X
Poaceae	**Bromus diandrus*	Great Brome	X	X	X
Poaceae	**Ehrharta longiflora*	Annual Veldt Grass	X	X	X
Poaceae	**Hordeum leporinum*	Barley Grass	X	X	X
Poaceae	**Lagurus ovatus*	Hare's Tail Grass	X		X
Poaceae	**Lolium rigidum*	Wimmera Ryegrass			X
Poaceae	**Poa annua*	Winter Grass	X		
Poaceae	**Polypogon monspeliensis*	Annual Beardgrass			X
Poaceae	**Cortaderia selloana*	Pampas Grass	X	X	

Family	Species	Common Name	2012 Management Plan	2019 Management Plan	2024 Management Plan
Poaceae	**Ehrharta calycina*	Perennial Veldt Grass	X	X	X
Poaceae	**Paspalum urvillei*	Vasey Grass	X	X	
Poaceae	**Cenchrus clandestinus*	Kikuyu Grass	X	X	X
Poaceae	**Cynodon dactylon*	Couch	X	X	X
Poaceae	**Stenotaphrum secundatum*	Buffalo Grass	X		X
Poaceae	**Eragrostis curvula*	African Lovegrass	X		
Polygonaceae	**Polygonum aviculare*	Wireweed			X
Polygonaceae	**Rumex acetosella*	Sorrel			X
Polygonaceae	**Rumex crispus*	Curled Dock			X
Polygonaceae	**Persicaria lapathifolia*		X		
Primulaceae	**Lysimachia arvensis*	Pimpernel	X	X	X
Rubiaceae	**Galium divaricatum*				X
Solanaceae	**Solanum nigrum*	Black Berry Nightshade	X	X	X
Tropaeolaceae	**Tropaeolum majus*	Garden Nasturtium	X	X	
Vitaceae	**Parthenocissus quinquefolia*				X
Vitaceae	**Parthenocissus tricuspidata*		X		