ADELAIDE PARK LANDS

Key Biodiversity Area Management Plan 2026-2031

10/04/2026

ACKNOWLEDGEMENT OF COUNTRY

The City of Adelaide acknowledges the Kaurna People of the Adelaide Plains as the Traditional Custodians of the land on which we live, work and gather. We acknowledge and honour their spiritual and cultural stewardship of this Country and recognise their deep and enduring relationship with its land, waters, the sky, and all living things. We pay our respects to Kaurna Elders past and present, and recognise the important role of emerging leaders in sustaining and strengthening culture.

ACKNOWLEDGEMENTS

The development of this *Key Biodiversity Area Management Plan* has been guided by the generosity, knowledge, and lived experience of Kaurna People, the Traditional Owners of the Adelaide Plains. We respectfully acknowledge the Kaurna community members who shared cultural insight, ecological knowledge, and perspectives that have shaped the direction and depth of this work.

We acknowledge **Firesticks Alliance Kaurna Group** for their contribution of cultural fire knowledge, principles of Caring for Country, and enduring commitment to healing landscapes through Indigenous-led practice.

A special acknowledgment is given to **Catherine Miles of Miles Environmental**, whose authorship, guidance, and commitment to respectful engagement ensures that the plan reflects the collective values and voices of all contributors.

LIST OF ACRONYMS

The following Acronyms are used in this plan:

APL	Adelaide Park Lands
CLMP	Community Land Management Plan
CoA	City of Adelaide
KBA	Key Biodiversity Area
CPTED	Crime Prevention through Environmental Design
PCZ	Protected Conservation Zone
BCZ	Buffer Conservation Zone
RCZ	Revegetation Conservation Zone
IRZ	Informal Recreation Zone
RWZ	Riparian and Wetland Zones
BUT	Butterfly Conservation Zone

DOCUMENT PROPERTIES

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1.6	9/04/2026	Haley Irvine	Formatting and final edit

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1. BACKGROUND

1.1 Purpose

This document provides Management Plans for each of the seven Key Biodiversity Areas (KBA's) within the Adelaide Park Lands (see Figure 1). The purpose of the Management Plans is to set the objectives, targets and management actions for each of these areas over the next five years (2026 to 2031).

The Management Plans define how these areas will be managed and the rationale behind those decisions. Chapter 3 outlines the target vegetation communities to guide planning within the KBAs.

The first KBA Management Plans were prepared in 2018 and have been important documents for CoA staff managing the KBAs. This update provides revision to those plans and includes an additional KBA #7.

Key Biodiversity Areas are globally significant sites for conservation having met one or more of eleven criteria under the themes of:

A. Threatened biodiversity

Sites that support significant populations of species or ecosystems at risk of extinction.

B. Geographically restricted biodiversity

Sites that hold species or ecosystems with limited global ranges or extent.

C. Ecological integrity

Sites with intact ecological communities that maintain natural processes and have low human impact.

D. Biological processes

Locations critical for key life-cycle events such as breeding aggregations, refuges, or recruitment sources.

E. Irreplaceability

Sites essential for achieving conservation goals, where loss would significantly reduce options for biodiversity protection.

KBA criteria is set by the International Union for Conservation of Nature (IUCN). The IUCN is the world's largest and most diverse environmental network, harnessing the knowledge, resources and reach of more than 1,400 Member organisations and 17,000 experts. This diversity and expertise make IUCN the global authority on the status of the natural world and the measures needed to safeguard it.

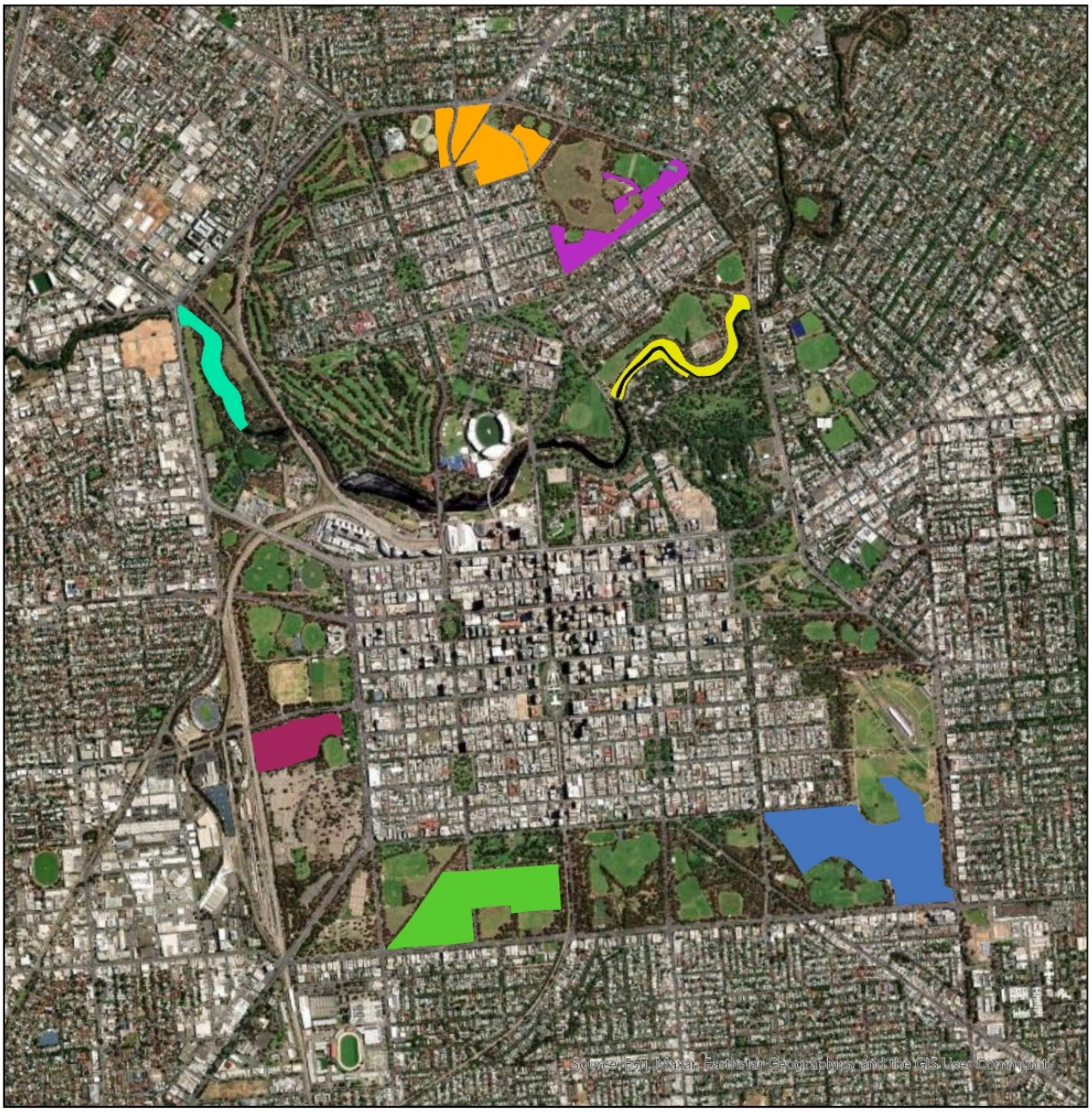

Figure 1 *Location of KBAs*

1.2 Strategic Context

1.2.1 Document Map

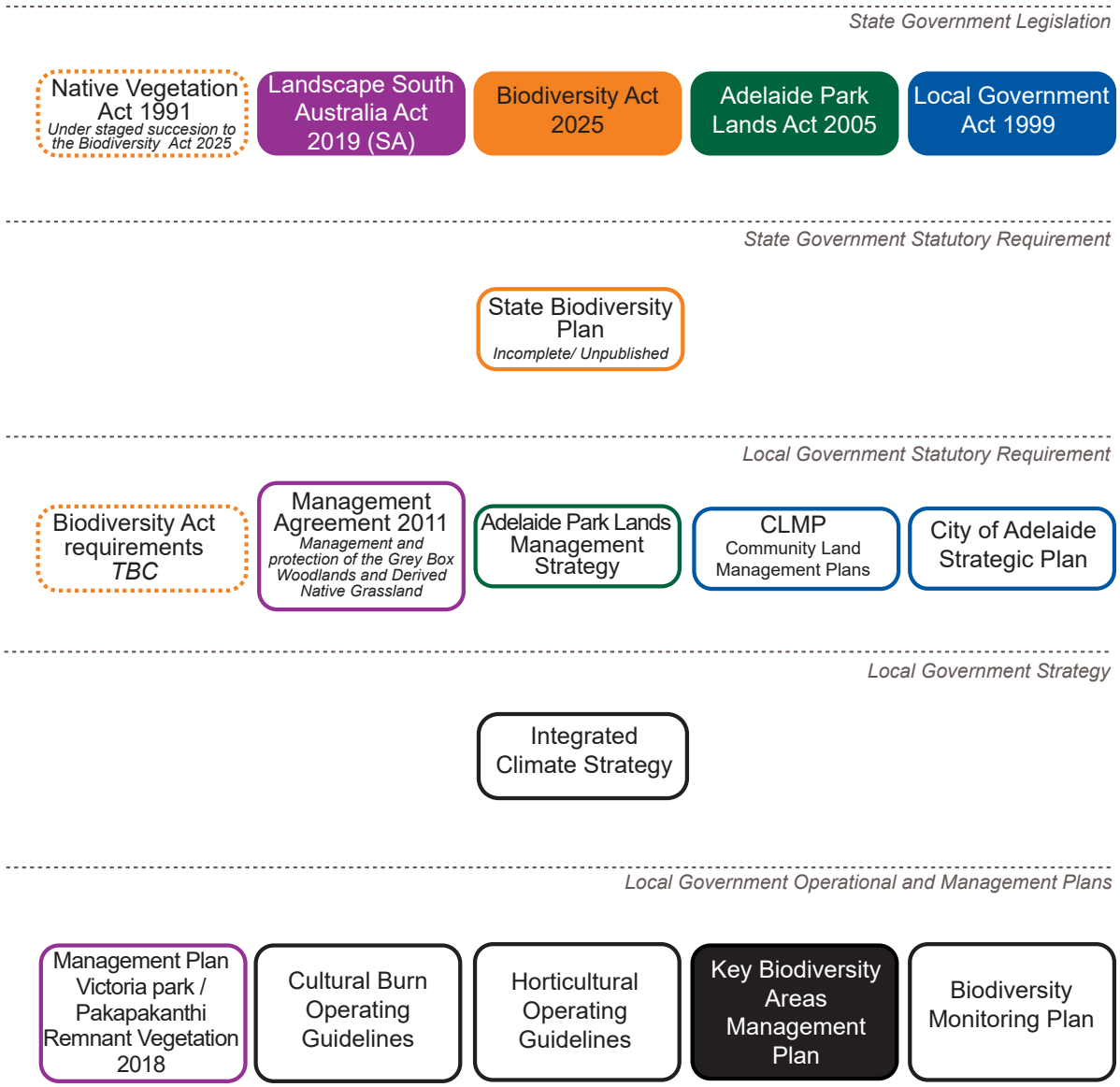

Figure 2 *Strategic Framework of The Adelaide Park Lands*

The Key Biodiversity Area Management Plans sit at the operational level of council and are guided and influenced by the principles set at a strategic level, particularly the Integrated Climate Strategy. It is noted that at the time of publication of this plan, a staged succession of the *Native Vegetation Act 1991* (SA) to the *Biodiversity Act 2025* (SA) is underway, with no definitive timeframe for completion.

1.2.2 City of Adelaide's Integrated Climate Strategy

The Integrated Climate Strategy (CoA 2023b) sets a vision for a resilient, protected and sustainable city where people can live, work, study and play and adapt to changes in the climate that bring social and economic opportunity and disruption. The management of KBAs are most closely aligned to Goal 3:

Goal 3: A city where nature thrives – our natural ecosystems are protected and enhanced in a changing climate.

Under **Goal 3** the following priorities are set and action required:

Priority	What is needed
7. Caring for Country in partnership with Kaurna Miyurna	In collaboration with Kaurna, integrated, celebrated, and promoted 'Caring for Country' approaches
8. Biodiversity, native grasslands and woodlands are protected and enhanced	There is a net increase in biodiversity, habitats, and ecosystem health within the City of Adelaide by 2030
9. Karrawirra Pari, waterways, Adelaide Park Lands, streets and squares act as arteries connecting our native species	Greater diversity of aquatic and terrestrial flora and fauna in the [Karrawirra Pari/ River Torrens] and urban water courses [And other actions for management of stormwater]

1.2.3 Community Land – Adelaide Park Lands

The purpose for which the Adelaide Park Lands is held is to:

'provide benefit to the people of South Australia by being publicly accessible and supporting a diverse range of environmental, natural heritage, cultural, recreational and social values and activities, providing a defining feature to the City of Adelaide, and contributing to the economic and social well-being of the city.'

Each park's purpose is to be a park within the overall open space network of the Adelaide Park Lands (CoA 2023a CLMP).

In addition, the Adelaide Park Lands are held for a number of purposes including:

- Protecting Key Biodiversity Areas.
- Supporting biodiversity and playing an important role in the recovery of pre-European native vegetation associations according to the topography and natural systems of each park.

- Providing a green open space buffer that visually and physically separates the urban form of the City to the surrounding adjacent suburbs.
- Providing a connection to nature for the community to improve health and wellbeing.
- Retaining trees, midstorey and understorey that contribute to overall canopy cover and biodiversity according to their landscape typologies and character. Trees should be retained and replaced with succession planting over time to maintain canopy targets and planting associations.

Principles for managing the Adelaide Park Lands (derived from the *Adelaide Park Lands Act 2005* (SA)) include:

- To protect the National Heritage Values of the Adelaide Park Lands and City Layout.
- To hold the Adelaide Park Lands for public benefit, freely available to the people of South Australia for their use and enjoyment.
- To ensure a balance of environmental, cultural, recreational and social uses of the Adelaide Park Lands.
- To recognise, protect, enhance and interpret cultural heritage sites of Kaurna, European and multicultural significance.
- To enhance and showcase the biodiversity of the Adelaide Park Lands, including areas of remnant vegetation and biodiversity significance.
- To enhance the ecological health of the Adelaide Park Land watercourses.
- To manage landscapes and buildings sustainably.

1.2.4 Kaurna Cultural Land Management Integration

The City of Adelaide has made a commitment to work with Traditional Owners to embed Kaurna-led cultural land management programs across the seven Key Biodiversity Areas.

This commitment centres on restoring cultural authority and access to Country for Kaurna peoples, to re-establish cultural land management practices, and to embed Indigenous decision-making as part of Council land management.

Further information is provided in Section 2.1.

1.2.5 Adelaide Park Lands Management Strategy

The Adelaide Park Lands Management Strategy – Towards 2036 (APLMS) is the lead strategic document for the Adelaide Park Lands.

The APLMS defines 'precincts' across the Adelaide Park Lands, as part of a spatial planning approach to deliver a diverse and integrated park system. To guide how management of the vegetation in each KBA is integrated with other existing and proposed uses, each management plan must be implemented with close consideration of the relevant precinct plan; accordingly, each management plan identifies the precinct in which the KBA is located.

Each KBA Plan also identifies the relevant Community Land Management Plan, any other relevant policy or planning document, and additional significant features.

1.2.6 External Plans and Strategies

Table 1 sets out the key regional, state and national biodiversity strategies relevant to the KBA Management Plans.

Region	Strategy	Key directions
Australia	Australia's Strategy for Nature 2024-2030	Objective 7: Reduce threats and risks to nature and build resilience Target: Minimise the impact of climate change on biodiversity and increase its resilience through mitigation, adaptation and disaster risk reduction actions, including by embedding climate change adaptation in all relevant decision-making, and through nature-based solutions and/or ecosystem-based approaches, while minimising negative and fostering positive impacts of climate action on biodiversity.
South Australia	*Biodiversity Act 2025* (SA)	The Biodiversity Act was passed in the State Parliament in June 2025 and different parts of the Act will gradually be proclaimed. The Act mandates the development of a *State Biodiversity Plan.*
Green Adelaide Region	Landscape Plan **Currently under review*	Goal: Conserve, restore and expand habitats for native flora and fauna
	Urban Greening Strategy for Metropolitan Adelaide	Targets: 30% urban tree canopy Improving plant species diversity

***Table 1** Relevant regional, state and national biodiversity planning*

1.3 Conservation Values

Covering 760 hectares of Council managed land, the Adelaide Park Lands are a nationally and internationally recognised park network that defines the City of Adelaide and contributes to its economic, environmental and social well-being. The Key Biodiversity Areas within the Adelaide Park Lands contain remnants of native vegetation communities representing the range of pre-European vegetation associations (described in Section 3, shown in Figure 2), of which less than 1% remains within a 5 km radius (NatureMaps 2025). These areas are unique within Adelaide's urban boundary as the only large-scale biodiversity sites and are therefore of high conservation value. The Karrawirra Pari/River Torrens Linear Park provides the only other significant native vegetation area, connecting the hills to the coast.

From 2023 to 2025 the CoA commissioned multiple biodiversity surveys of the Adelaide Park Lands, focussing on the KBAs and other priority areas. The Biodiversity Survey included vegetation condition and plant and animal species diversity. Key findings are presented in the Summary Report (CoA 2024) and include:

Ecosystems	Grey Box (*Eucalyptus microcarpa*) grassy woodlands and derived native grasslands – a Nationally endangered ecological community. Older plantings of local and non-local eucalypt species provide resources for native fauna, including tree hollows, nectar, pollen, logs and leaf litter.
Plant species	Total of 183 indigenous plant species and 5 State threatened species: 1. Swollen Spear Grass (*Austrostipa gibbosa*) – Rare in SA 2. Rock Logania *(Logania saxitalis)* – Rare in SA 3. Mount Lofty Speedwell *(Veronica derwentiana* ssp*. homalodonta)* – Critically endangered nationally and endangered in SA 4. Upright Milfoil (*Myriophyllum crispatum*) – Vulnerable in SA 5. Wavy Marshwort *(Nymphoides crenata)* – Rare in SA A number of species are also threatened regionally.
Mammals	8 species of bats (3 of which had not previously been recorded). Healthy populations of Common Brushtail and Common Ringtail Possums 2 threatened species: ○ Common Brushtail Possum (*Trichosurus vulpecula)* - Rare in SA ○ Grey-headed Flying Fox (*Pteropus poliocephalus*) - Rare in SA
Invertebrates	71 native bee species (2 of which had not previously been recorded). 664 of other unique species including: ○ Chequered Copper Butterfly *(Lucia libaria)* – Rare in Metropolitan Adelaide ○ Jewel Beetle (*Diphucrania trimentula)* - rarely recorded species for both the State and region
Birds	Birds were not included in the survey specifically but two threatened species were observed: ○ Australasian Shoveler (Spatula rhynchotis) – Rare in SA ○ Yellow-tailed Black Cockatoo (Zanda funerea) – Vulnerable in SA

Reptiles	Not included in the survey specifically but one threatened species was observed: ○ Eastern Water Skink *(Eulamprus quoyii)* - Vulnerable in Metropolitan Adelaide
Fish	9 species of native fish in Torrens River /Karrawirra Pari, including the Shortfinned Eel (*Anguilla australis,* unofficial Rare rating in SA)

An important outcome of the Biodiversity Surveys was the identification of the Community Education Hub in GS Kingston Park/ Wirrarninthi (Park 23) as an area of high biodiversity value, leading to its classification as a KBA.

1.4 Climate Change

Adelaide's future climate is predicted to be hotter and drier with increasing frequency and intensity of extreme events such as heatwaves and floods. A summary of the key changes by 2050 are presented in **Table 2.**

In brief, they include increasing temperatures, more frequent hot days, declining rainfall but more intensive heavy rainfall events. Major impacts of climate change on vegetation will be increased evapotranspiration and reduced soil moisture (GA 2025). This will lead to increasing water stress for plants, shorter growing seasons for some species (i.e. winter annuals), changes in behaviour or physiology (such as flowering and pollen production) and altered survival and recruitment success of many species. Impacts of climate change may also be compounded by urban heat island effects and altered surface run-off. The overall result will be changes in the structure and composition of vegetation communities which is taken into consideration in planning revegetation and setting vegetation targets.

Variable	Baseline (1986 – 2005)	Mean projected change 2050 (RCP4.5 to RCP8.5)
Annual mean daily maximum temperature (^{0}C)	21.8	+1.6
Summer daily maximum temperature (^{0}C)	21.3	+ 1.8 to + 1.9
Mean annual rainfall (mm)	530	-3 to -5%
Spring rainfall (mm)	141	-11 to -20%
Mean number of very hot days (over 40^0)	1.1	+3.0 to + 4.1
Extreme rainfall (mean days per year above 99.9th percentile)	0.38	Projected frequency: 0.59 to 0.71

Table 2 *Projected change in climate variables for Adelaide under RCP4.5 and RCP8.5 (source: DEW 2022 pp. 24-25)*

The Integrated Climate Strategy incorporates goals to reduce climate impact and improve resilience and adaptability to climate change. As noted above, the management of KBAs comes under Goal 3: A city where nature thrives (refer Section 1.2.2).

2. FRAMEWORK FOR MANAGEMENT PLANS

2.1 Embedded Kaurna Cultural Management

The following section has been prepared by Rayne Simpson and Quahli Newchurch (Firesticks Alliance - Kaurna Group).

2.1.1 Opportunity

The City of Adelaide seeks to strengthen its Key Biodiversity Management Plan by embracing cultural burning as a foundational element of land stewardship.

Cultural fire represents a time-tested land-care practice that has successfully shaped the landscape for thousands of years. Including it in biodiversity management recognises both its ecological benefits and the deep knowledge held by Kaurna custodians.

To effectively incorporate cultural burning, the City of Adelaide can partner with Kaurna Elders and fire practitioners, establishing them as key leaders in designing, guiding and implementing burning programs across the Adelaide Park Lands Key Biodiversity Areas.

The City of Adelaide's Integrated Climate Strategy and Cultural Burn Operating Guidelines establish a policy framework that supports caring for Country practices and the use of cultural fire in biodiversity planning. This approach can be further supported through the development of annual burn schedules to complement existing management practices with Indigenous land management wisdom. In doing so, the City of Adelaide seeks to support critical ecological processes, enhance biodiversity resilience, and honour its commitment to respectful collaboration with Traditional Owners.

Embracing cultural burning represents a pathway toward more complete, sustainable, and culturally informed biodiversity management that benefits the entire community.

2.1.2 Benefits

Key benefits of implementing cultural burns as advised by Kaurna cultural fire practitioners include:

Improved ecosystem health
Cultural burns use low-intensity, mosaic fire that mimics natural processes, helping maintain balanced ecosystems and encouraging healthy vegetation structure.

By creating a mosaic of burnt and unburnt patches, providing varied microhabitats that support a wide range of animals, from ground-dwelling insects to small reptiles and birds.

Enhanced biodiversity
Many native plant species respond positively to gentle, frequent burning. Cultural fire can promote seed germination, increase habitat diversity, and support species that rely on open, mosaic-style landscapes.

Reduced fuel loads and safer fire regimes
Regular cultural burning reduces build-up of dry vegetation in a controlled, low-risk way, supporting long-term fire safety within and around urban green spaces.

Revival of Indigenous cultural land management
Implementing cultural fire reconnects the Adelaide Park Lands with millennia-old Kaurna ecological knowledge, supporting cultural renewal and fostering respectful partnerships with Traditional Owners.

Improved habitat resilience to climate change
By reducing stress on ecosystems and promoting native species adapted to fire, cultural burning can make habitats more resilient to heatwaves, drought, and extreme weather.

Support for threatened species and ecological communities
Low-intensity burns can suppress invasive species, open up native ground layers, and maintain conditions needed by species that struggle under dense vegetation or long unburnt conditions.

Better soil health and nutrient cycling
Cultural fire techniques minimise soil damage, improve nutrient turnover, and protect microbial communities, contributing to healthier and more productive soils.

Increased community engagement and education
Cultural burning provides opportunities for public learning, cultural exchange, and community involvement in caring for Country.

Enhanced food resources for pollinators and invertebrates
Low-intensity burning promotes the regrowth of nectar- and pollen-producing native plants. This benefits pollinating insects, including the Copper Chequered Butterfly, which relies on healthy populations of its larval host plants and nectar sources.

Support for the life cycle of native bee species

Cultural fire can help maintain open patches of bare ground by reducing weeds and dense thatch. This is critical to the lifecycle of native ground-nesting bees, which require exposed soil to construct burrows and lay their eggs. By encouraging recruitment of native flora species, cultural burns also increase the availability of pollen and nectar, further supporting native bee populations.

Control of invasive species that threaten native fauna

By reducing invasive grasses and weeds that outcompete native flora, cultural burns indirectly support fauna that depend on native plants for food, shelter, or breeding sites.

Increased structural diversity for birds and small mammals

Cultural burns maintain multi-layered vegetation structure, open ground, sparse understorey, and intact refuges, which enhances foraging and nesting opportunities for species adapted to varied environments.

Improved movement corridors

Maintaining open yet vegetated pathways through careful burning can support safe movement for small fauna, improving genetic exchange and reducing habitat fragmentation.

2.1.3 Implementation

Kaurna implementation of cultural burning centres on restoring cultural authority, re-establishing traditional fire and land management practices, and embedding Indigenous decision-making as part of land management.

Key to implementing the cultural land management program is to have Cultural fire practitioners, guided by Kaurna Elders, to lead site assessments within KBAs to determine where, when, and how cultural burns should occur, drawing on deep knowledge of seasonal indicators, plant lifecycles, soil conditions, animal behaviours, environmental conditions and weather patterns.

Kaurna-led teams assist with mapping culturally appropriate burn zones, establishing burn objectives for each site, such as supporting native grasses, regenerating key plant species, protecting fauna habitat, or revitalising areas of cultural significance and designing low-intensity, mosaic-style burns tailored to the specific needs of each landscape.

Kaurna-led monitoring follows each burn, evaluating ecological responses, reinstating culturally informed adaptive management, and ensuring that fire practices continue to

strengthen both biodiversity outcomes and cultural continuity across the Adelaide Park Lands.

Implementation encourages cross cultural exchange between cultural fire practitioners with City of Adelaide, its Aboriginal Ranger(s), biodiversity team and other staff through on-Country learning, while developing co-governance protocols, and building burn calendars aligned with the Kaurna seasonal cycle.

Shared aims for Kaurna cultural land management are:

Kaurna Authority and Decision-Making
A clear statement that cultural fire practitioners, guided by Elders, hold primary authority to determine where, when, and how cultural burns occur, partnering with CoA to deliver on-ground works and wider community engagement.

Consent, Indigenous Cultural Intellectual Property (ICIP) Protection and Cultural Protocols
Explicit requirements for free, prior, and informed consent, protection of Kaurna ICIP, and adherence to cultural protocols in all stages of planning, implementation, and knowledge sharing.

Cultural Fire Objectives and Ecological Outcomes
A set of clearly defined aims linking cultural burning to biodiversity goals, such as native species regeneration, habitat restoration, weed suppression, and protection of culturally significant landscapes.

Operational Pathways and Burn Program Structure
A practical outline of how burns will be scheduled, approved, resourced, and conducted, aligned with the Kaurna seasonal calendar.

Training, Capacity Building, and On-Country Learning
Commitments to Kaurna-led training for CoA staff, contractors, and partner organisations, ensuring all involved understand cultural fire philosophy and protocols.

Monitoring, Reporting, and Adaptive Management
A Kaurna designed system for pre and post-burn ecological monitoring, cultural indicators of success, and ongoing adaptive management.

Inclusion

The inclusion of Aboriginal Land Management practices in the Adelaide Park Lands Key Biodiversity Areas will deliver significant ecological, cultural, and fauna-related benefits.

2.2 Definition of Key Biodiversity Areas (KBA)

The areas of the KBAs are defined within the Adelaide Park Lands Community Land Management Plan (CLMP).

In addition to the overall purpose for which the Adelaide Park Lands are held (see above CoA 2023), each Park may have a specific purpose for which it is held, outlined in the Park Specific Management section of the CLMP. This includes designation as a Key Biodiversity Area (KBA) which is a management boundary that prioritises high value native biodiversity. At least one Key Biodiversity Area is in each of the five recognised pre-European vegetation communities across the Adelaide Park Lands (CoA 2025). KBAs can include all or part of a Park and may encompass areas from adjoining parks.

2.3 Zoning

A zoning approach is used in these KBA Management Plans with KBAs divided into different zones to clarify how areas within the KBA should be managed. Each KBA Plan maps and describes the zoning that will be used for management. KBAs may have multiple zones of the same type, in which case they are numbered.

The following classification of zones are applied in KBAs:

Protected Conservation Zone (PCZ)

The areas within the KBA that are of highest conservation value. Biodiversity conservation is the primary land use and objective within these zones. Individual site management / maintenance plans may be developed for these zones.

Buffer Conservation Zone (BCZ)

Areas that are of lower conservation value than protected conservation zones but have sufficient remnant biodiversity to be sympathetically managed to achieve broader biodiversity outcomes.

Revegetation Conservation Zone (RCZ)

Areas of high-quality re-established local vegetation and habitat. Only plantings that use stock of carefully considered provenance and that contribute positively to the ecological objectives for the KBA are considered as revegetation conservation zones. These zones may also include areas in which revegetation is planned but has not yet been implemented.

Informal Recreation Zone (IRZ)

Areas that contain scattered native plants or other notable conservation values but have informal recreation or similar as the primary land use. Opportunities can be sought to modify management practices, such as mowing and pesticide application, to favour the native biodiversity and thereby contribute to larger populations and greater connectivity.

Riparian and Wetland Zones (RWZ)

Areas associated with a permanent or temporary water body (i.e. watercourse or wetland), including:

- Watercourse or wetland in areas that may be regularly or seasonally dry or exposed,
- Areas outside the watercourse or wetland where the soils would normally be saturated and/or flooded.

This classification recognises:

- The careful management that is required in these areas to protect aquatic ecosystems,
- The unique importance of these environments for aquatic and semi-aquatic species,
- Their role as habitat for terrestrial species, especially as cool refuges during hot periods that are anticipated to occur more frequently under future climate conditions.

Butterfly Conservation Zone (BUT)

An area within KBA 1 which is located south of the management agreement area. The area supports a population of the rare Chequered Copper Butterfly and includes some remnant vegetation. Management practices aim to conserve the Chequered Copper Butterfly population by protecting its host plant species, *Oxalis perennans* and obligate ant species *Iridomyrmex sp.*

Other Zones:

Additional special conservation zones are defined in some KBAs.

2.4 Management Principles

The KBA Management Plans have been prepared in accordance with the principles below.

Remnants and revegetation

Protecting and enhancing remnant vegetation and habitat is the highest priority.

- Remnant vegetation will be managed using best-practice techniques to promote survival and recruitment of desirable native species.

Revegetation plays a role where it assists in enhancing viability and size of existing remnants, and for pre-European communities that have been fully cleared. However, this should be well planned and have clear ecological goals.

Connectivity

Connected populations have greater genetic diversity and are more resilient.

To maximise the likelihood of populations of species surviving, larger populations are preferable. This increases genetic diversity, reduces the risk of local extinction, and increases the capacity of the populations, species and ecosystems to cope with a changing climate.

Biodiversity should be managed at a landscape scale rather than at the scale of individual remnants. Managing the best-quality biodiversity areas with linkages to improve connectivity will facilitate larger, more genetically diverse and resilient populations.

Adapting and building resilience to climate change

Native vegetation management needs to adapt to and build resilience to climate change.

- This includes flexibility in the selection of plant species and target vegetation communities rather than rigidly applying the pre-European community descriptions (described in Section 3). Appropriate genetic and species diversity will be included to overcome landscape-scale fragmentation, with collection of plant material substituting for the natural flow of genes and species.

Different management approaches should also be trialled to assist the establishment of native vegetation and maintenance of long-lived habitat trees. These could include watering at certain life stages, thinning trees and shrubs in older and dense revegetation areas, directing run-off from paths to trees, or use of crushed rock as a mulch. All new approaches should be well planned, documented and monitored so that their effectiveness can be evaluated to inform future management.

Target vegetation communities and revegetation species selection

In general, the restoration target for PCZ's and RCZ's is to restore the pre-European vegetation communities (as described in section 3). However, given the lack of representative examples of these communities, highly modified conditions in the Adelaide Park Lands (i.e. history of clearance, fragmentation, grazing, planting of lawns and trees, soil modification and changes in hydrology), multiple land uses and pressures of climate change, these communities are not considered absolute targets.

The general vegetation structure and composition of key species should be a part of the targets, but some flexibility is required to accommodate:

- Ecological values contributed by some planted vegetation (e.g. tree hollows, nectar sources and leaf litter),
- Heritage values, and
- CPTED requirements.

Furthermore, the wetlands within KBAs are artificially constructed environments (i.e. stormwater management wetlands) while the watercourses (i.e. Park Lands Creek and the Karrawirra Pari/ River Torrens) have a modified flow regime and water levels. The target vegetation for these areas is therefore based around providing a variety of structures and species from the Adelaide Plains and foothills regions that are adapted to the water regimes and provide habitat for a range of aquatic, semi-aquatic and terrestrial fauna.

Inclusive, Open and Timely Decision-making

The key stakeholders involved in management of the KBAs will communicate openly with one another and will come together at least annually to review progress on the KBA Management Plans and identify the program of work for the coming year.

2.5 Hierarchy of Objectives

The following hierarchy of objectives are applied for each KBA:

Type	Scale	Timeframe	Definition
Aim	Whole KBA	50 year	The long-term aspiration for the KBA.
Objective	Whole KBA	25 year	Measurable long-term description(s) of what is to be achieved at the whole of KBA scale. Objectives are standardised across KBAs so far as applicable.
Target vegetation community	KBA (or part KBA)	25 year	The target vegetation community for the KBA based on the detailed descriptions for the relevant vegetation communities in Chapter 3.
5 year target	Zone	5 years	A measurable condition or change in condition to be achieved for each zone as steps towards the target vegetation and objectives. The baseline state for the indicators is presented in the biodiversity surveys (see list of References).

Table 3 *Hierarchy of Objectives for Key Biodiversity Areas*

The aims, objectives and targets from the 2018 Management Plan were reviewed as part of the development of this Plan. It is therefore considered that the start date for achieving the longer-term timeframes is 2018, with the exception of KBA 7, which will be measured from 2026.

2.5.1 Species of conservation significance

An objective for all KBA's is to increase the populations of significant species, and known significant species are listed for each KBA. For the purposes of this plan, significant species are defined as:

- Species that are listed as Rare, Vulnerable or Endangered at a state or national level,
- Species that are considered Rare, Vulnerable or Endangered regionally and have not been widely established through revegetation, (for example River Bottlebrush (*Callistemon sieberi)* is considered rare in the Flinders Lofty Block but regionally has been well established through revegetation), and
- Species that are considered locally significant, especially as original remnants of the Adelaide Plains (for example Native Oxalis (*Oxalis perennans)* is regionally common but locally rare and important ecologically for the Chequered Copper Butterfly).

Legislatively and locally recognised significant species are listed for each KBA.

2.6 Horticultural Maintenance Guidelines

Horticultural maintenance guidelines (CoA 2019) outline the standard to which the Adelaide Park Lands and Open Space will be maintained. Section 2.9 sets out the guidelines for KBAs, including the objectives and performance standards for management of each of the types of zones. As the guidelines were prepared prior to this Plan they do not cover the Wetland and Riparian Zone, a preliminary guideline for these zones is presented in Appendix A1.1. The Guidelines should be reviewed for any inconsistencies with this revised Plan and to incorporate the new zones within their next review.

The following Horticultural Maintenance Guidelines will apply in each zone:

Zone type	Acronym	Horticultural Maintenance Guideline (ACC2012/121120)
Protected conservation zone	PCZ	Section 2.9 pages 156-157
Buffer conservation zone	BCZ	Section 2.9 pages 158-159
Revegetation conservation zone	RCZ	Section 2.9 pages 160-161
Informal recreation zone	IRZ	Section 2.9 pages 162-163
Wetland and riparian zone	WRZ	See Appendix A1.1 interim guideline
Other zones	NA	Section 2.9 pages 164-166

Table 4 *Horticultural Maintenance Guideline reference table*

2.7 Interpretation, Education and Facilities

Facilities to encourage people to explore, understand and value KBAs and the biodiversity of the Adelaide Plains and Adelaide Park Lands without damaging their values will be maintained or newly installed where required. During the planning stage for such works, an impact assessment should be conducted to ensure that impacts on significant flora and fauna are avoided and CPTED is achieved. All facilities will require higher levels of maintenance in the immediate vicinity to keep weed and native growth down to achieve community expectations and CPTED objectives.

2.7.1 Amenities

Community amenities including seating opportunities may be incorporated to draw people to experience KBAs and should be sited in areas where there will be minimal impacts and CPTED principles (see below) are upheld. In general, this will be in Buffer Conservation and Informal Recreation Zones.

Trails encourage people to enjoy and value the KBAs and need careful planning to achieve their objectives without impacting site values. New trails should be located outside of Protected Conservation Zones and high quality Revegetation Conservation Zones.

A number of unofficial trails have been created throughout the Adelaide Park Lands. While these should ideally be closed and rehabilitated, and their creation strongly discouraged, once made they need to be managed. The response should therefore be to initially attempt closure through signage, revegetation and/or placing cut branches across them. If this is unsuccessful then pruning and weed control along the path may be required for CPTED, and evaluation of other safety requirements.

Additional planting of trees for shading trails and other facilities should only be undertaken where it is compatible with the target vegetation for the zones.

A list of KBA facilities and requirements is presented in **Appendix 3.**

2.7.2 Education and Interpretation

Interpretive and educational signs and trails encourage interaction, enjoyment and education about KBAs. A suite of signage has been developed for KBAs aligned to the City of Adelaide Wayfinding and Signage Guidelines to provide boundary markers and links to on-line information and resources.

Existing signage is documented in the asset database and monitored to ensure they are in good condition and information is correct. A list of KBA signage and requirements is presented in **Appendix 3.**

2.8 Crime Prevention Through Environmental Design (CPTED)

CPTED is defined as “the proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, and an improvement in the quality of life” a multi-disciplinary approach to crime prevention that uses urban and architectural design and the management of built and natural environments.

“The design initiatives and principles can include:

- The layout and visual appearance of an area, including lighting and landscaping.
- The design, positioning and materials used for buildings and other physical structures.
- The interaction and encouragement of legitimate activities; and

- The ongoing management and maintenance of the particular space."

"CPTED involves the design of physical space in the context of the:

- Needs of bona fide users and the normal and intended use of space.
- Predictable behaviour of both bona fide users and offenders."

"A successful CPTED approach is appropriate if it recognises the designated use of the space and defines the crime problem incidental to, and the solution compatible with, the designated use. It incorporates crime prevention strategies that enhance (or at least do not impair) the effective use of the space (Crowe 2000 p. 46 in South Australia Police)."

For the Adelaide Park Lands, including the KBAs, this will be considered through the placement and management of vegetation to maintain sight lines, particularly around paths/trails. Given most of the target vegetation associations are open grassy woodland types, achieving CPTED is generally achievable without compromising biodiversity objectives.

Guidelines for implementing CPTED in KBAs are presented in **Appendix 2.**

2.9 Monitoring and Evaluation

The KBA Management Plans set 5-year targets and outline actions to achieve those over that timeframe and are reviewed and updated at 5 years.

This information is set out in the Biodiversity Monitoring Plan which should be read in conjunction with the Management Plans.

The Biodiversity Monitoring Plan will assist in tracking progress on the KBA Management Plans and inform the plan review process.

3. VEGETATION COMMUNITIES

This section outlines the vegetation and other ecological features that were present at the time of European settlement and that are present now. This includes a description of the five main pre-European vegetation communities, based on the work of Kraehenbuehl (1996) and Long (2003). Each of these vegetation communities are represented in at least one KBA, however there are slight differences in the mapping of these communities between the two sources, as shown in **Figure 3**.

The five vegetation communities are:

I. *Eucalyptus microcarpa* (Grey Box) / *E. leucoxylon* (SA Blue Gum) Woodland.

II. *Eucalyptus leucoxylon* (SA Blue Gum) / *E. camaldulensis* (River Red Gum) Woodland.

III. *Eucalyptus camaldulensis* (River Red Gum) Woodland along the creeks and river systems.

IV. A. *Eucalyptus porosa* (Mallee Box) Woodland in the west of the city and adjoining city area.

IV. B. *Eucalyptus porosa* (Mallee Box) Woodland in North Adelaide.

Each of these communities is described in detail below with the target vegetation composition and structure. Lists of species considered likely to have been present in these communities are presented in **Appendix 1.**

The vegetation communities are later referred to in Section 4 – Management Plans for Key Biodiversity Areas to guide management activities in each KBA.

Cultural Significance of Vegetation Communities and Landscapes

KBAs sit on top of the culturally rich Tarntanyangga – place of the Red Kangaroo Dreaming. The main water system through this part of Kaurna Country is the Karrawirra Parri / River Torrens– The Red Gum Forest River, an entity of high importance for Kaurna peoples.

Pre-colonisation, Tarntanyangga was an incredibly biodiverse landscape, containing all that was needed for life to thrive. The land as it once was, has been heavily impacted by land clearance, construction, farming and agriculture.

Today, the small pockets of remnant vegetation within the CoA are of high significance for Kaurna people to protect, preserve and promote. The few remnant canopy trees that remain

within the Adelaide Park Lands and KBAs are the Elders of this landscape, and are important providers of food, medicine, habitat, and water for all life around them. These Elders cannot be replaced within our lifetime.

The areas containing remnants of native grasslands throughout the KBAs are indications of ancient food systems that were once abundant across the Adelaide Plains. Within these systems grains, vegetables, herbs and associated fauna were found, providing food availability throughout the year for all that lived within the space. Protecting, preserving and promoting these systems is vital in an ever-changing climate, where food security is at risk.

The Karrawirra Parri / River Torrens contains a number of important food and fibre plants, and habitat for an abundance of fauna species, yet has become polluted, like many of our waterways. Our waterways are the lifeblood of our landscape, and preservation of our waters is key to the preservation of life.

Key management methods are being reintroduced into each of these systems, including cultural fire and harvest, through the integration of Kaurna cultural land management programs within the KBAs.

Cultural fire is vital to the health of our landscape, as our landscape evolved over thousands of years with this intricate practice. Cultural fire provides important nutrients to the soils, it provides the right temperatures for germination of native seed, and promotes fresh, new growth. It naturally thins out areas of unnatural density.

Cultural harvest supports the health of plants through “pruning” and keeps system density at an appropriate scale.

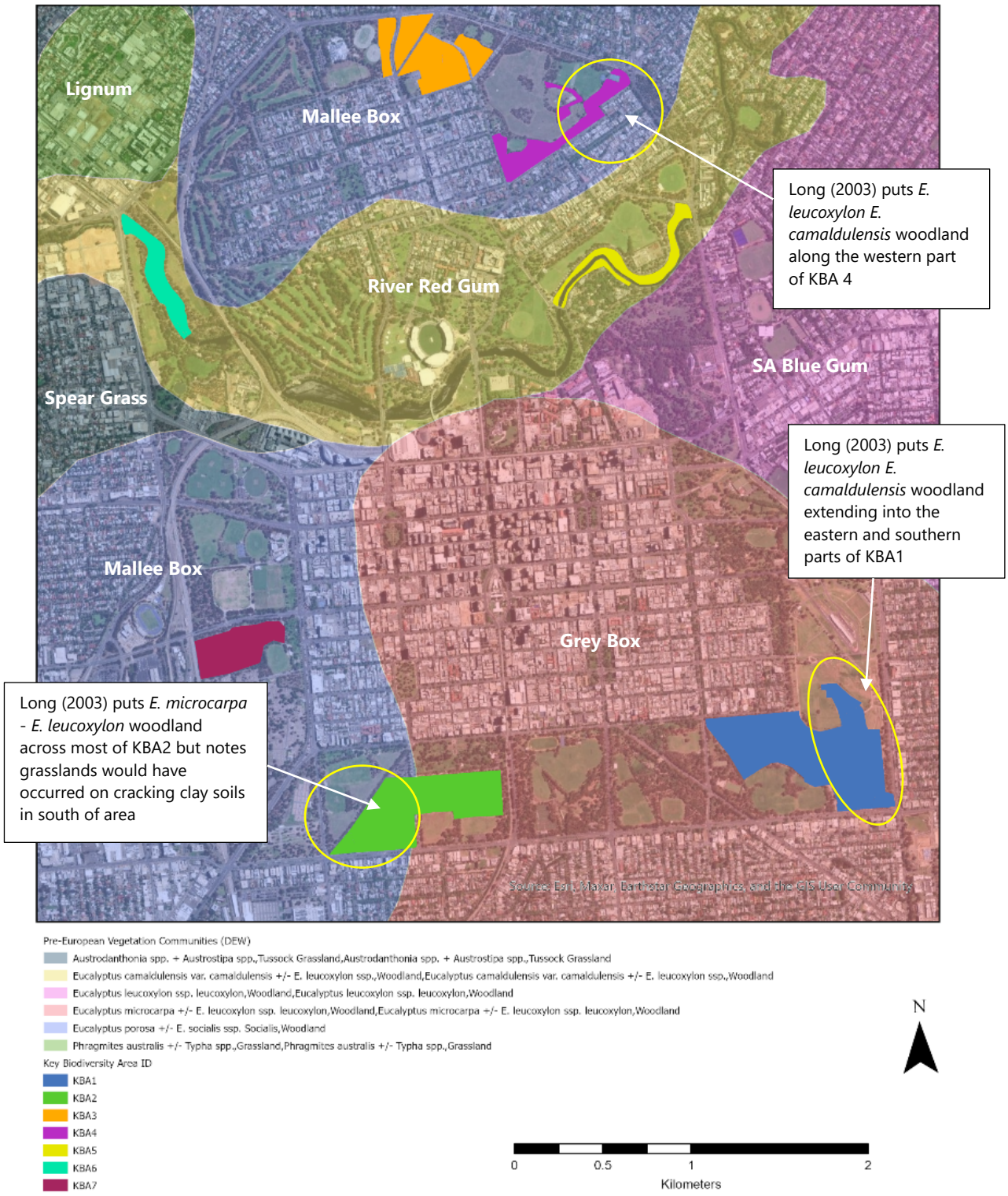

Figure 3 *Distribution of Pre-European Vegetation Communities (as mapped by Kraehenbuehl) and location of KBAs, showing areas where Long (2003, Figure 14, p. 25) mapped different boundaries.*

Source: Pre-European vegetation communities, DEW GDA 2020 licensed under a Creative Commons By Attribution 4.0 Australia Licence; http://creativecommons.org/licenses/by/4.0/

3.1 Grey Box (Eucalyptus microcarpa) with SA Blue Gum (E. leucoxylon ssp. leucoxylon) Woodland

Kraehenbuehl's (1996) account shows that this landscape was highly variable in composition and structure, with the tree canopy cover and the thickness of shrub and small-tree layers varying significantly. Accordingly, variability in composition and structure of native vegetation within KBAs is considered appropriate.

Examples of more intact remnants of this vegetation association can be found in reserves in the foothills to the south and east of Adelaide, including in:

- Beaumont Common (Burnside),
- Mitcham Hills (e.g. Watiparinga and adjacent reserves), and
- Lower parts of Belair National Park, although these areas have higher rainfall and soil types may not be identical.

Refer to Long (2003) Plant Association I (p. 31) and Kraehenbuehl (1996) section 4 "The Black Forest" for further information and sites.

KBA 2 is on the lower rainfall and topographic edge of the mapped extent for Grey Box. SA Blue Gum woodland is present in KBA 2 on the "lower" edge of its extent. This makes this vegetation community very vulnerable to the effects of climate change. The selection of species for revegetation of this association should include a high proportion of species that also occur in the adjacent western association whilst maintaining the target structure. The provenance of the plant stock should also be considered.

3.1.1 Composition

The following information on species present are from Kraehenbuehl (1996, Chapter 4) and Long (2003, pp. 26 and 31). The species mentioned will be included in the vegetation in appropriate locations (see also under Structure below). The species in **Appendix 1** plus any native species found and considered after consultation with external experts to be suitable, are considered to be appropriate for this community in the Adelaide Park Lands.

The complete species list is provided in in **Appendix 1.**

As most KBA areas where this vegetation community is considered to have occurred already have a well established mid- and overstorey (albeit not always aligned to the same species composition), any future revegetation should be focussed on establishing ground layer species, especially the non-grass components, where the cover and/or diversity is low.

Structural layer	Common species
Overstorey	Grey Box (*E. microcarpa*) with SA Blue Gum (*E. leucoxylon* ssp. *leucoxylon*) and River Red Gum (*E. camaldulensis* ssp. *camaldulensis*) as co-dominants.
Midstorey	Density ranging from near absent to moderately dense. Golden Wattle (*Acacia pycnantha*) and other species of wattle, Drooping Sheoak (*Allocasuarina verticillata*), Sweet Bursaria (*Bursaria spinosa* ssp. *spinosa*), and Yacca (*Xanthorrhoea semiplana* ssp *semiplana*).
Ground layer	Typically grassy, with a high diversity of forbs and other non-grass species such as Liliaceae tussocks, groundcovers and small shrubs.

3.1.2 Structure

To capture some of the variability in this pre-European vegetation community, and to provide guidance for aims in vegetation structure in the KBA, profile silhouettes show the generalised structure for two forms of Grey Box / SA Blue Gum grassy woodland: a very open woodland with no midstorey or small shrubs (Figure 4), and a more closed woodland with a midstorey of shrubs and small trees (Figure 5).

Figure 4 *Profile silhouette showing generalised structure for 3.1a - a very open Grey Box / SA Blue Gum grassy woodland with no midstorey*

Figure 5 *Profile silhouette showing generalised structure for 3.1b- a more closed Grey Box / SA Blue Gum grassy woodland with a midstorey of shrubs and small trees*

Some locations in the KBA will aim for the open structure, and other locations will aim for the more closed structure, as outlined in the Management Plans for KBA 1 and KBA 2.

The sources of information for these representations of structure were Croft et al. (2009)[1], Boomsma and Lewis (1980)[2] and Kraehenbuehl (1996).

[1] Croft, SJ, Milne, TI and Pedler, JA (2009) Bushland Condition Monitoring Manual - Southern Mount Lofty Ranges. Nature Conservation Society of SA Inc, Adelaide.
[2] Boomsma, CD and Lewis, NB (1980) The Native Forest and Woodland Vegetation of South Australia. Woods and Forest Department, Adelaide, South Australia

3.2 SA Blue Gum (Eucalyptus leucoxylon ssp. leucoxylon) / River Red Gum (E. camaldulensis ssp. camaldulensis) Woodland

The distribution of this vegetation association is mapped differently by Kraehenbuehl (1996) and Long (2003) (see **Figure 3**). Although both considered it to occur in the east Adelaide Park Lands where it merged with River Red Gum and Grey Box communities, Long (2003) also considered that it would have occurred on Red Brown Earth soils 'in Gilberton, which likely extend through the Melbourne Street section of North Adelaide'. We adopt Long's (2003) distribution boundaries for this association in the north-east Adelaide Park Lands.

Refer to Long (2003) Plant Association II (p. 31) and Kraehenbuehl (1996) section 6 "The Plains and River Torrens between Kent Town and Stonyfell" pp. 90-91 for further information.

There are many examples of this vegetation association in the Mount Lofty Ranges but few on the Adelaide Plains. Kraehenbuel (1993) recommends Ferguson Conservation Park at Stonyfell. The description also includes the watercourse community which is considered applicable for the Park Lands Creek in KBA 1.

The SA Blue Gum and River Red Gum woodland vegetation association in KBA 1 and KBA 4 is at the low rainfall margins of the association's distribution (and many of the species that occur within it). This community may be vulnerable to the effects of climate change within the KBAs and the selection of species for revegetation of this association should include a high proportion of species that also occur in the adjacent western association, whilst maintaining the target structure. The provenance of the plant stock should also be considered.

3.2.1 Composition

The following information on species present is from Kraehenbuehl (1996, pp. 90-91 and 100–105) and Long (2003, pp. 26 and 31). The species in these lists, plus any native species found and considered after consultation with external experts to be suitable, are considered to be appropriate for this community in the Adelaide Park Lands.

As most KBA areas where this vegetation community is considered to have occurred already have a well established mid-storey and overstorey any future revegetation should be focussed on establishing ground layer species in areas where the cover and/or diversity is low.

The complete species list is provided in in **Appendix 1.**

Structural layer	Common species
Overstorey	SA Blue Gum and River Red Gum as co-dominants, occasional Grey Box.
Midstorey	Sub-canopy of Native Cherry (*Exocarpus cupressiformis*), Drooping Sheoak and Golden Wattle. Shrub layer of Sweet Bursaria and Yacca, Sticky Hop-bush, Wreath Wattle (*Acacia acinacea*), Kangaroo Thorn (*A. paradoxa*), Twiggy Daisy-bush (*Olearia ramulosa*) and Dwarf Hakea (*Hakea rugosa*).
Ground layer	Low shrubs: Guinea-flowers (*Hibbertia* spp.), Spider-flower (*Grevillea lavandulacea* ssp. *lavandulacea* Tussocks: Iron-grasses (*Lomandra* spp.), Black-anther Flax-lily (*Dianella revoluta*) Groundcovers: Running Post-man (*Kennedia prostrata*) and Pale Fan-flower (*Scaevola albida*) A high cover of native grasses and many perennials and annuals (herbs, orchids and lilies).

3.2.2 Structure

Kraehenbuehl (1996, p. 90) considers that this vegetation community had a sparse shrub layer and was relatively 'open and parklike' (compared to similar communities towards the foothills), and that the majority of species were 'perennial herbs, grasses and annuals'.

The target structure is therefore an overstorey canopy of 30–40% cover, a midstorey of scattered shrubs and small trees, with a diverse understorey of 95% cover.

3.3 Eucalyptus camaldulensis (River Red Gum) Woodland along the creeks and river systems

The Karrawirra Pari / River Torrens has been greatly altered since European settlement. It was originally a small river with numerous waterholes and highly variable flow, with periods of no flow being common in summer. The flora and fauna varied in response to these spatial and temporal variations and were therefore highly variable. The River is now highly regulated and very little native vegetation remains. For these reasons, accurate reconstruction of pre-European environments is not feasible. Nevertheless, re-establishment of species that occurred at the time of settlement will have benefits for biodiversity conservation and watercourse management (e.g. bank stabilisation, slowing of flows, and improvement of water quality).

The following description is based on Chapter 5 of Kraehenbuehl (1996), and pages 26–27 and 32 of Long (2003). Many of the aquatic species are present within the catchment and easily establish naturally where conditions are suitable. As the river systems of the Adelaide Plains have been heavily modified, there are no intact remnants of these vegetation

associations. Sections of the Gawler River however may provide some guidance on the likely bank and floodplain vegetation associations, while the upper (foothill) reaches of the River Torrens may provide some examples of the lower bank and bed vegetation associations.

Long (2003) listed the characteristic species of the 'terraces and river banks', 'floodplains' and 'river bed' of the River Torrens / Karrawirra Pari; this division is used for planning within the KBAs (see **Appendix 1**).

3.3.1 Composition

The composition and structure are defined by the position of the vegetation in relation to the "normal pool level" and frequency of flooding.

The overstorey throughout consisted of River Red Gum, with some SA Blue Gum and scattered Drooping Sheoak trees on upper (infrequently flooded) slopes.

The 'river bed' was highly variable. Common Reed and Bulrush were common, forming a distinct vegetation association in places. Swamp Wattle was present, and the understorey was rich in sedges and herbs. Aquatic macrophytes were also present.

Along the 'terraces and river banks' (i.e. immediately above normal pool level, with soils likely to be saturated most if not all year), some areas had dense thickets of Silky Tea-tree (*Leptospermum lanigerum*) and River Bottlebrush (*Callistemon sieberi*). Various species of small and medium-sized shrubs and understorey species were also present.

The 'floodplains' refers to areas that are located above the level of the terraces and banks. The main location is Botanic Park (Kraehenbuehl 1996, p. 81); this vegetation is likely to have also been present on the north side of Karrawirra Pari / Torrens River in Mistletoe Park / Tainmuntilla (Park 11), across from Botanic Park. Midstorey species included Golden Wattle, Sweet Bursaria and Austral Hollyhock. The understorey contained numerous grasses and forbs. As the upper slopes are probably less frequently flooded now and also drier due to surface water being diverted by roads, these zones may now grade into adjacent vegetation associations (i.e. SA Blue Gum (*Eucalyptus leucoxylon* ssp. *leucoxylon*) / River Red Gum (*E. camaldulensis* ssp. *camaldulensis*) Woodland and Mallee Box (*Eucalyptus porosa*) Woodland in North Adelaide).

The complete species list is provided in in **Appendix 1.**

3.3.2 Structure

The following information on structure is from Kraehenbuehl (1996) and Long (2003):

- River bed and banks:
    - Silky Tea-tree and River Bottlebrush occurred in dense thickets in some locations on the banks and beds.
    - Common Reed (*Phragmites australis*) and Bulrush (*Typha domingensis*) occurred as a closed herbland, suggesting that some areas on the bed were dominated by one or both of these.
    - Long (2003, p. 32) suggested that other associations may have been present in locations where different species or groups listed above were dominant; this includes Swamp Wattle (*Acacia provincialis*) tall shrubland, *Cyperus* spp. sedgelands, and herblands dominated by any of the herbaceous species listed.
- Floodplains: Kraehenbuehl's accounts indicate that there was a River Red Gum woodland of great majesty on the floodplains, however there are very few records of shrubs and small trees in this vegetation. This suggests that this woodland had an open midstorey with an understorey rich in forbs and grasses.

A dense shrubland of Silky Tea-tree and River Bottlebrush was successfully established from 2007 in Bonython Park / Tulya Wardli (Park 27). This would have been similar to the dense thickets described above. However, after a major flood event in 2016, very large amounts of litter and other debris became embedded in this vegetation, and the shrubs themselves were severely damaged. The resultant management of this location was difficult and expensive. Consequently, re-creation of a shrubland of similar density will not be pursued. These species will be planted as scattered individuals, and they will be managed to prevent the formation of thickets.

Revegetation areas in proximity to trails will include scattered shrubs and small trees that become very sparse adjacent to trails to incorporate CPTED principles.

3.4 Mallee Box (Eucalyptus porosa) Woodland in the west of the city and adjoining city area

Kraehenbuehl (1996) determined that *Eucalyptus porosa* (Mallee Box) woodland was extensive on the northern Adelaide Plains, with its southern extremity occurring in the south-west Adelaide Park Lands vicinity. This vegetation type, which occurred on the brown soils of the Para Fault Block (Long 2003), is more typical of dry mallee / woodland than the Grey Box, SA Blue Gum and River Red Gum woodlands to the south and east of the city. It was characterised by the presence of numerous chenopod shrubs in the midstorey (including

from the genera *Atriplex*, *Maireana* and *Rhagodia*) and a rich ground layer of grasses and forbs.

Although detailed knowledge of the composition and structure of this vegetation is limited, Kraehenbuehl (1996) and Long (2003) described two distinct associations of Mallee Box woodland in the city area, one in the west Adelaide Park Lands and adjoining city area and the other in North Adelaide (see Section 3.5). This association in the west Adelaide Park Lands may have been associated with areas that were damp and/or have heavy subsoils causing seasonal waterlogging (Long 2003). The areas west of the city have been extensively cleared and there are effectively no intact remnants of this association in this area (although remnant species occur, especially in the West Terrace Cemetery). There are, however, remnants of Mallee Box woodland north and south of Adelaide which may provide a representation of this association, including in Aldinga Scrub and the Lewiston area.

3.4.1 Composition

The following summary of species present is from Kraehenbuehl (1996, pp. 135–137) and Long (2003, pp. 28 and 32). The species in the complete list (see **Appendix 1**), plus any native species found and considered after consultation with external experts to be suitable, are considered appropriate for this community in the Adelaide Park Lands. Given the scarcity of remnants and records for this community as well as alterations to the environment, the species mix presented is a broad guide only and the goal should be mostly focussed on achieving the broad structural components with a diverse ground layer of species drawn from the Adelaide Plains, particularly the drier North Adelaide Mallee Box woodland association.

The complete species list is provided in in **Appendix 1**.

Structural layer	Common species
Overstorey	Mallee Box with subcanopy of Drooping Sheoak, Native Apricot (*Pittosporum angustofolium*), Quandong (*Santalum acuminatum*) Golden Wattle and Broughton Willow.
Midstorey	Wattles (A. acinacea, A. ligulata), Native Sarsaparilla (Hardenbergia violacea).
Ground layer	Chenopods (including *Enchylaena tomentosa, Maireana enchylaenoides, Atriplex semibaccata*) with a diversity of native grasses, sedges, rushes, lilies (including the *Lomandras*) and flowering species such as New Holland Daisies (*Vittadinia* spp.), Native Oxalis and Pussy-tails (*Ptilotus spathulatus spathulatus*).

3.4.2 Structure

There are few clues available to the structure of the Mallee Box woodland in this location prior to European settlement. Kraehenbuehl refers to the association as a ‘mallee community’; however, the Mallee Box trees remaining at Folland Park, Enfield, are large trees with one to three trunks, not low multi-stemmed mallee trees. Similarly, Mallee Box remnants north and south of Adelaide also comprise large and widely spaced trees typical of woodlands.

The numerous grasses, forbs and small shrubs on the species lists suggest a relatively open structure. The target structure in the KBA will therefore be an open woodland with 30% overstorey cover, 20% midstorey cover, and 75-95% understorey cover (leaving some open space for insects and reptiles to bask).

Kraehenbuehl (1996) stated that the Mallee Box woodland of the west Adelaide Park Lands would have intermingled with the Grey Box / SA Blue Gum woodland to the east. Although there are minor differences in the location of the boundary between the vegetation types in the maps in Kraehenbuehl (1996) and Long (2003), both show the boundary to be in Golden Wattle Park / Mirnu Wirra (Park 21W).

3.5 Mallee Box (Eucalyptus porosa) Woodland in North Adelaide

This is the second Mallee Box dominated woodland association described by Kraehenbuehl (1996, pp. 137–145) and Long (2003, pp. 28–29 and 33) and is associated with drier, higher ground areas than the first.

3.5.1 Composition

The following summary of species present is from Kraehenbuehl (1996, pp. 137–145) and Long (2003, pp. 28–29 and 33). These were based largely on data from the Enfield area, where a similar association is believed to have occurred. A remnant of vegetation at Folland Park, Enfield, provides a vital insight into the pre-European vegetation. Kraehenbuehl (1996, p. 147) recommends that vegetation re-establishment in the north Adelaide Park Lands be based on species lists from North Adelaide, Prospect and Enfield.

The species in these lists, plus any native species found and considered after consultation with external experts to be suitable, are considered to be appropriate for this community in the Adelaide Park Lands.

The complete species list is provided in in **Appendix 1**.

Structural layer	Common species
Overstorey	Mallee Box with Red Mallee (*E.* socialis) and Southern Cypress Pine (*Callitris gracilis*) with a subcanopy of drooping Sheoak, Native Apricot (*Pittosporum angustofolium*), Quandong (*Santalum acuminatum*) Golden Wattle and Native Cherry (*Exocarpos cupressiformis*).
Midstorey	Wattles (including. *A. pycnantha, A. ligulata, A. victoriae var. victoriae*), Senna (*Senna artemesioides* ssp.), Sticky Hop-bush (*Dodonaea viscosa* ssp. *spathulata*), Sea-berry Saltbush (*Rhagodia candolleana* ssp. *candolleana*) and smaller shrubs.
Ground layer	Lilies (including the *Lomandra*s and *Dianella revoluta*), Goodenias (*G. pinnatifolia, G. blackii*), many daisies (e.g. *Vittadina* spp., *Helichrysum leucopsideum*) and a diverse range of native grasses.

3.5.2 Structure

The main clues to the structure of the Mallee Box woodland in this location prior to European settlement are from Folland Park, Enfield. Long (2003) notes that there was probably less pine (*Callitris gracilis*) in the North Adelaide vegetation than at Enfield.

The remnant Mallee Box trees at Folland Park are larger than the Red Mallee and White Mallee trees. Furthermore, the midstorey at Folland Park is variable in density, with some patches containing a dense layer of shrubs (for example, Desert Senna) and other patches being more open with an understorey of grasses, forbs and small shrubs.

The target structure in the KBA will therefore be a closed woodland with 40% overstorey cover, 30% midstorey cover, and 75-95% understorey cover (with areas of leaf litter and soil crust for basking animals). The aim is to create an open shrub layer with patches of shrubs such as Desert Senna.

4. MANAGEMENT PLANS FOR KEY BIODIVERSITY AREAS

4.1 Management Objectives and Actions for All KBAs

The following objectives apply to all KBAs:

1. To restore Kaurna-led cultural land management across the KBA.

2. To increase the populations of significant species.

3. To maintain and restore vegetation in Protected and/or Revegetation Conservation and/or Riparian and Wetland Zones so that it resembles the composition and structure of the target vegetation communities in excellent condition.

Some KBAs have additional objectives which are outlined in the KBA-specific management plan in the following sections.

The targets and actions outlined in **Table 5** apply to all KBAs in addition to the 5-year targets and actions set for each zone within each KBA.

Table 5 *Management targets and actions applying to all KBAs*

5 Year Target(s)	Actions
Review of all KBAs for Kaurna-led cultural land management practices within the 5 year period.	Kaurna-led cultural land management (see Section 2.1). Actions determined from review processes and planning of on-ground works. May include, but not be limited to (for example): Cultural fire applied within different vegetation communities, with priority to native grass populations, riparian vegetation, leaf litter, weed control, fire prevention.
Up to date database of significant species developed and maintained.	Consolidate records of locations and population sizes of significant species into a single georeferenced database. Review and update database at least every five years and preferably annually.

4.2 Key Biodiversity Area 1 (KBA 1)

4.2.1 Background

Location	Victoria Park / Pakapakanthi (Park 16) and Carriageway Park / Tuthangga (Park 17)
Precinct	Victoria Park Precinct
Other documents	Victoria Park/Pakapakanthi (Park 16) Master Plan 2024 Adelaide Park Lands Community Land Management Plan – Annexures 16 and 17 Brown Hill Keswick Creek Catchment Stormwater Management Plan 2016 Management Plan - Victoria Park / Pakapakanthi (Park 16) Remnant Vegetation Site Maintenance Plan - Victoria Park / Pakapakanthi (Park 16) Remnant Vegetation Bush For Life management plan for remnant vegetation site at Carriageway Park / Tuthangga [CM1.1][CM (Park 17)

4.2.2 Description

Figure 7 shows the KBA boundary and zones within KBA 1 and other significant features.

Target vegetation communities	0 Grey Box (*Eucalyptus microcarpa)* with SA Blue Gum *(E. leucoxylon* ssp. *leucoxylon*) Woodland for the majority 3.2 SA Blue Gum (*Eucalyptus leucoxylon* ssp. *leucoxylon*) / River Red Gum (*E. camaldulensis* ssp. *camaldulensis*) Woodland – along Fullarton Road (RCZ 1 and RCZ 2 and the creek). The wetlands are a novel ecological community that do not have a pre-European reference. The aim is to establish a diversity of vegetation species that are native to the region and self-sustaining, with a range of microhabitats across the different hydrological zones.
Vegetation	This KBA is based around remnants of grassy woodland vegetation with native ground layer in good to excellent condition. In the last five years a diverse native grassland has been revegetated adjacent to one of these areas and stormwater wetlands constructed and planted with a diversity of native wetland flora. There has also been extensive revegetation of parts of the South Park Lands Creek. Surrounding buffer areas in poorer condition provide opportunities for expanding and connecting higher quality areas, providing corridors for movement and habitat for less specialised species. The condition of native vegetation in 2024 for each zone is presented in **Table 6**.
Significant features	A unique Butterfly Conservation Zone (BUT) was created for the protection and improvement of butterfly habitat within KBA 1. The Butterfly

	Conservation Zone is located to the south of an area under a management agreement. The area supports a population of the rare Chequered Copper Butterfly and has some additional remnant biodiversity and food plants. The Pakapakanthi Wetlands were completed in 2021 as part of the Brown Hill Keswick Creek Catchment Stormwater Management Plan. State rare Wavy Marshwort was planted and has established in the wetlands. Bush for Life volunteers are restoring remnant native vegetation in PCZ 3. Part of this area was the site of the first Kaurna Kardla Parranthi Cultural Burn in the Adelaide Park Lands. The Miyawaki planting site to the east is a novel revegetation project demonstrating high intensity revegetation methods. The Green Pakapakanthi community group have plans to continue this approach with a grassland focussed site near to the existing site and provide weed removal from the wetland.
Other Major Uses	• Elm Avenue Carriageway • South Terrace Croquet Club • South Park Lands Creek • Pakapakanthi Wetland • Dog training area • Sports ovals
Volunteer Groups	• Bush for Life (Trees for Life) (PCZ 3) • Green Pakapakanthi (South East City Residents Association) • Catholic Education SA (biodiversity planting in 2023 and 2024 in RCZ 4)

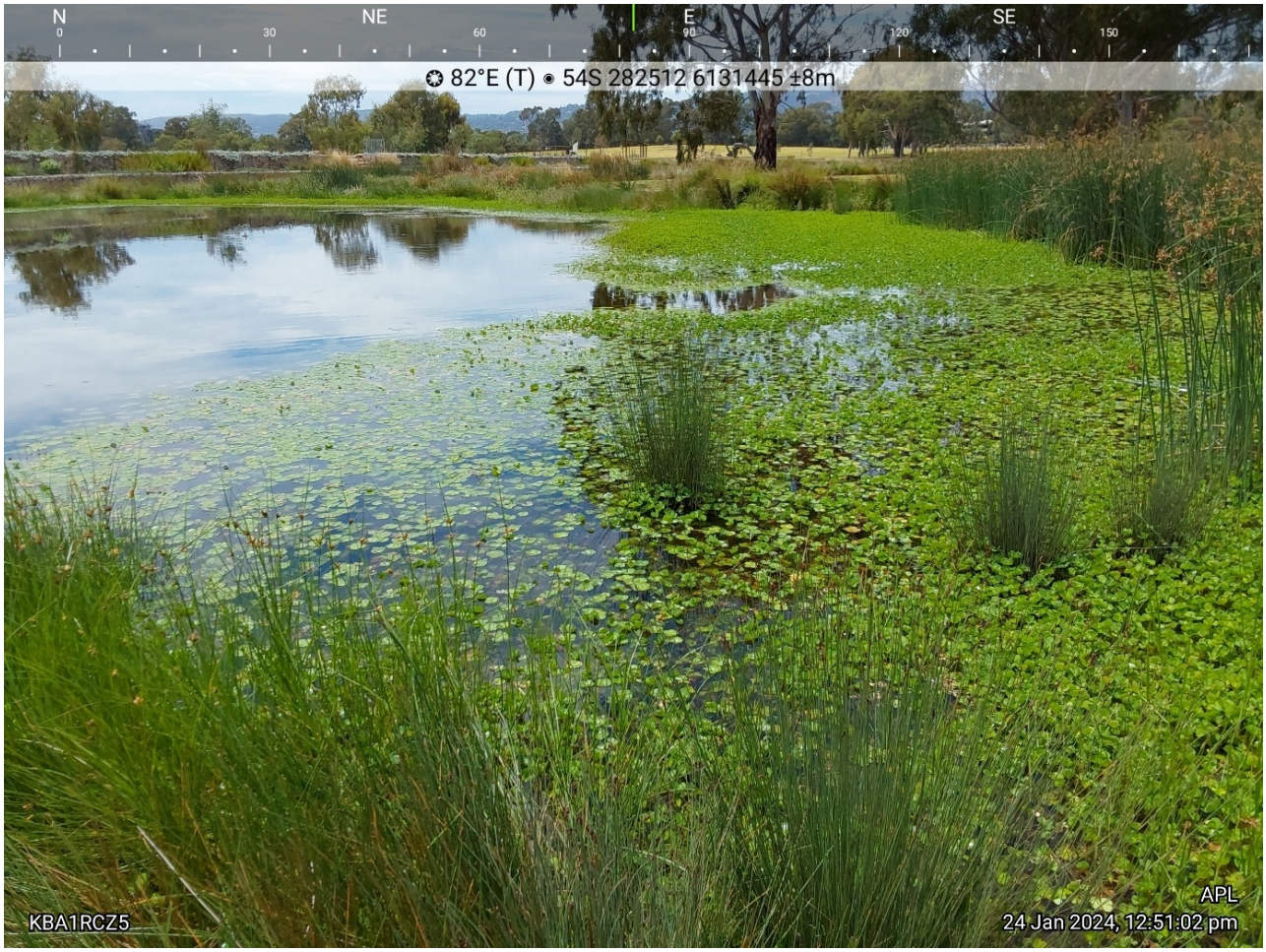

Figure 6 Pakapakanthi wetlands (zone RWZ1)

***Figure 7** Zoning* and significant features *for KBA 1*

4.2.3 Zones

Figure 7 shows the zoning for KBA 1 and significant features. The zones are briefly described in **Table 6** from the native vegetation survey (Miles 2024). Note that there have been some changes to the boundaries of the zones since the previous plan: expansion of PCZ 1, PCZ 2 and RCZ 2 and re-alignment of BCZ 2 and IRZ 1.

Table 6 *Summary of vegetation communities and condition for each zone (Miles 2024)*

Zone type	Zone ID	Vegetation description	Vegetation condition	Comments
Protected conservation	PCZ 1	Spear-grass (*Austrostipa* spp*I)* and Wallaby-grass (*Rytidosperma caespitosum)* grassland with emergent River Red Gums (*Eucalyptus camaldulensis* ssp. *camaldulensis*)	**Good**	Site of cultural burn in 2025.
	PCZ 2	*Eucalyptus cladocalyx* ssp. +/- *E. camaldulensis* ssp. *camaldulensis* woodland over *Acacia paradoxa*, *Austrostipa curticoma*, *Rytidosperma* spp.	**Excellent**	Non-local native Sugar Gums provide hollows.
	PCZ 3	*Eucalyptus cladocalyx* ssp. +/- *E. camaldulensis* ssp. *camaldulensis* woodland over *Acacia acinacea*, *Austrostipa* spp., *Rytidosperma* spp.	**Good**	Site of cultural burn in 2021. Area extended due to expansion of native ground layer species.
	PCZ 4	*Themeda triandra* grassland	**Excellent**	Recent scrape revegetation. Formerly classed as RCZ 1.
Buffer	BCZ 1	*Eucalyptus cladocalyx* ssp. +/- *E. camaldulensis* ssp. *camaldulensis* +/- *Eucalyptus leucoxylon* ssp. *leucoxylon* woodland over Kikuyu grass	**Poor**	Includes Elm Carriageway with many Elms in very poor health but also regenerating. There are patches of native grasses. Small revegetation areas included (formerly separated RCZ 2 & RCZ 4).
	BCZ 2	Exotic grassland	**Poor ***	New part of the KBA.
Revegetation	RCZ 1	*Eucalyptus camaldulensis* ssp. *camaldulensis* woodland over *Acacia paradoxa*	**Moderate**	Formerly RCZ 3.
	RCZ 2	*Eucalyptus camaldulensis* ssp. *camaldulensis* woodland over revegetation	**Poor** to **Moderate***	New part of the KBA, northern area revegetated, southern only contains overstorey trees.
Butterfly	BUT 1	*Rytidosperma* spp. over kikuyu grassland	**Poor**	The Chequered Copper Butterfly requires two other species to be present: a plant Native Sorrel (*Oxalis perennans*) and an ant (*Iridomyrmex refoniger*). Aim to achieve relatively open patches of native grasses and bare ground

Zone type	Zone ID	Vegetation description	Vegetation condition	Comments
				with an increase in key food plants.
Informal recreation	IRZ 1	Kikuyu grass land with scattered *Eucalyptus camaldulensis* ssp. *camaldulensis* with patchy revegetation	**Very poor**	Expanded to take in the croquet and training area (formerly part of the BCZ 1).
Riparian & Wetland	RWZ 1	*Bolboschoenus caldwelliii, Schoenoplectus validus Juncus* spp. sedgeland over *Marsilea drummondii* herbland	**Good**	Good condition and diverse vegetation, lacking deeper water vegetation.
	RWZ 2	Revegetated *Eucalyptus camaldulensis* ssp. *camaldulensis* +/- shrubs over *Phragmites australis & Persicaria decipiens*	**Moderate**	Formerly RCZ 6. Erosion in some sections.
	RWZ 3	*Eucalyptus cladocalyx* ssp over revegetated *Eucalyptus camaldulensis* ssp. *camaldulensis* +/- shrubs over *Phragmites australis & Persicaria decipiens*	**Moderate**	Formerly RCZ 5 plus expanded into BCZ 1 to more of the watercourse.

*Not assessed in 2024, rating based on rapid qualitative assessment, flora species not recorded in this plan.

4.2.4 Biodiversity Survey Results

The following is a summary of KBA 1 biodiversity survey results:

- High density of possums, with Brushtail Possums more abundant in Victoria Park / Pakapakanthi (Park 16) and Ringtail Possums more abundant in Carriageway Park / Tuthangga (Park 17) (McKenzie 2024).
- Pakapakanthi Wetland vegetation is diverse and in good condition, Spotted Marsh-frog and cryptic wetland birds have established naturally (Taylor et. al 2024).
- Moderate-high diversity of microbats (Rust 2024).
- High diversity and numbers of native bees (Hogendoorn & Leijs 2024).
- 34% of KBA 1 has native vegetation in good to excellent condition (Miles 2024).
- Contains nationally threatened Grey Box grassy woodlands and derived highly diverse native grasslands (e.g. Figure 8).

4.2.5 Management Plan

Aims

Four protected conservation zones to be high quality Grey Box / SA Blue Gum grassy woodlands, linked by buffer zones that have multiple uses and contain substantial populations of native flora.

Revegetation conservation zones will have been carefully planned and managed and will be contributing positively to native species' population sizes and viability and represent good condition Grey Box / SA Blue Gum grassy woodlands.

Riparian and wetland zones that support a diversity of native flora and fauna, provide refuge for terrestrial fauna and connectivity between protected conservation zones.

The KBA provides habitat for a diverse range of native fauna and the Chequered Copper Butterfly.

Kaurna Land Management is implemented across the KBA (see Section 2.1).

Objectives

In addition to the objectives set out in Section 4.1, the following objectives apply to KBA 1:

- To extend the area of vegetation considered good and excellent.
- To improve connectivity between high value native vegetation areas.
- To increase the number and diversity of small bird and bat species.
- To establish and maintain diverse native Riparian and Wetland Zones that support water management objectives while providing habitat for aquatic and semi-aquatic species and refugia for terrestrial species.
- To ensure that the Chequered Copper Butterfly persists in the primary habitat area (BUT 1 – core) and facilitate the persistence of a viable population of the Chequered Copper Butterfly.

Vegetation management

Variability - As described in Section 3.1, the Grey Box / SA Blue Gum woodland that occurred here was highly variable in composition and structure, with the tree canopy cover

and the thickness of shrub and small-tree layers varying significantly. Accordingly, variability in composition and structure of native vegetation within the KBA is considered appropriate; some locations in the KBA will aim for an open woodland structure, and other locations will aim for a more closed structure, as outlined in Section 3.1.

Novel Ecosystems - The Pakapakanthi Wetlands (RWZ 1) are a novel ecosystem and the aim for this area is a wetland vegetation community comprising species native to the Adelaide region that achieves the aims of the Brownhill Keswick Creek Stormwater Management Authority and provides a range of habitats for native aquatic and semi-aquatic fauna.

Similarly, the South Park Lands Creek alignment is not “natural” (not shown in Light’s 1839 map but does appear on the 1949 aerial photo) and is likely to be deeper and flowing more frequently (from stormwater run-off) than “natural” Adelaide Plains drainages. The target vegetation community is to establish a vegetation community of local native species that is adapted to the water regime and provides habitat for semi-aquatic and terrestrial fauna.

Sugar Gum Plantings – PCZ 2, BCZ 1 and RWZ 3 have high tree cover, comprised of many large planted eucalypts that are not locally indigenous, including many Sugar Gums (*Eucalyptus cladocalyx).* It is accepted that, in the interim, these non-local trees provide the only structural component of this layer and also provide the only hollows, and that the species will be different from the pre-European vegetation.

Buffer Conservation Zone - The aim is to enable larger populations of some species that are located in this zone and the PCZs, including Native Sorrel (*Oxalis perennans*) and species of wallaby grass (*Rytidosperma* spp.) and spear grass (*Austrostipa* spp.). It should also facilitate movement across the landscape of some fauna species, such as the Chequered Copper butterfly, and movement of pollen and seed to facilitate genetic flow.

Figure 8 *Good stands of Kangaroo Grass (Themeda triandra) and spear-grasses* (*Austrostipa* spp.*) over native herbs with inter-tussock spaces in PCZ 4 (formerly RCZ 1)*

4.2.6 Management Targets and Action

See also 5-year targets and management actions for all KBAs in Section 4.1.

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
PCZ 1	3.1a	CBT	Maintain or increase the diversity of native ground layer species, focussing on herbaceous species. Reduce thatch and increase actively growing grass biomass.	Manage according to the Victoria Park/Pakapakanthi (Park 16) Remnant Vegetation Management Plan and Site Maintenance Plan. Essential: • No planting of woody species including as shade trees for proposed new paths. • Reduce thatch amongst grass tussocks to increase open space and promote native grass germination. • Control weeds following burning/or slashing, working from southern boundary with PCZ 4 to north east. High priority: • Plant patches of herbaceous species (i.e. lilies, daisies, oxalis) from the target community around perimeter and into newly expanded areas. Moderate/low priority: • Install signage to explain lack of shade trees. • If tree regeneration occurs following burning, thin to retain open grassy woodland structure.
PCZ 2	3.1b	CBT	Maintain the cover and diversity of native understorey. Reduce the cover of exotic species.	Essential: • Do not plant or replace trees or large shrubs when they die. • Encourage survival and recruitment of understorey species on the agreed list, with an emphasis on non-grass species (follow techniques from PCZ 1 Site Maintenance Plan). • Implement burning and/or control grassy weeds and perennial herbs (Galenia and Ribbed Plantain). High priority: • Remove some large shrubs, especially *Acacia paradoxa* and/or prune lower branches to maintain visibility and keep total cover below 10%; remove regeneration of *A. paradoxa*. • Assess approaches to conserve population of *Pterostylis pedunculata*, including establishing new locations and ensuring appropriate genetic diversity. • Monitor for and remove regeneration of non-local and exotic trees and shrubs.
PCZ 3	3.1b	BFL	Maintain and expand area of high-quality native ground layer.	Manage according to agreed Bush For Life plan. This includes different management approaches in 23 quadrats, with close assessment of different outcomes to inform ongoing adaptation of actions.
PCZ 4	3.1a	CBT	Maintain site in excellent condition.	Essential • Annual sweep through site to control perennial herbaceous weeds.

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
				High priority. • Monitor thatch build up and loss of inter-tussock spaces and implement burning and/or slashing if required (sections at a time e.g. thirds). • Spot spray/hand weed annual grasses and herbs.
BUT 1	NA	NA	Suitability as habitat for Chequered Copper Butterfly improved. Increase the area of key plant species (including *Oxalis perennans*).	Essential • Focus management on improving and expanding the core zone and cover of key plant species (e.g. *Oxalis perennans*); weeding and planting may be required. High priority • Active management of non-native and weed species to protect habitat patches. Low • Evaluate the sensitivity of significant species to various bush regeneration techniques (including use of herbicides) that may improve the cover of native species.
RWZ 1	NA	Cont., CBT, Hort & PLR	Diversity of native flora and fauna maintained or improved. Abundant native species <10% cover. Exotic species <5% cover.	Essential • Control *Cyperus eragrostis* (priority to preventing seed set), hand removal may be required; implement soil hygiene so not spread. • Monitor *Typha* spp. and *Phragmites australis* and implement control options (see A1.1) if cover >10%. • Manage water levels and wetland capacity for ecological and stormwater management outcomes; machinery to be thoroughly cleaned before and after works to prevent weed spread. • Monitor for and control exotic trees and other high threat weeds at least every 2 years. High priority • Monitor presence and coverage of submerged aquatic vegetation; if not established naturally by 2028 trial introductions of Adelaide Plains species.
RWZ2 & 3	3.2	CBT	Diversity of native flora maintained. Coverage of native understorey increased, especially into upstream areas. Exotic flora species <5% (except Sugar Gums).	Essential • Monitor for and control exotic trees and woody weeds every 2 years at minimum. • Monitor for and control *Cyperus eragrostis* annually at minimum. • Assess erosion at wetland inlet and outlet and implement appropriate management measures. High priority • Do not replace any non-local tree species when they die. • Assess erosion throughout watercourse and implement appropriate management measures. • Extend revegetation in upstream section of the creek.
RCZ1	3.1b	PLR & CBT	Improve the diversity of native ground layer (<0.5m) species.	Essential • Every second-year patrol for and control exotic trees and woody weeds. High priority

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
				• Monitor for regeneration of *Acacia paradoxa* and limit to no more (and ideally less) than 1 plant recruited every 3 years (including around perimeter of zones) and total cover less than 10%. • Spot weed around native understorey and regenerating plants, with priority to areas between PCZ 2 & PCZ 3.
RCZ2	3.2	CBT	Midstorey and understorey established throughout zone. Moderate diversity of native species and life forms established throughout.	Essential • Every second-year patrol for and control exotic trees and woody weeds. • Do not replace exotic trees when they die. • Undertake revegetation in southern section, use CPTED principles to guide placement. • Spot weed herbaceous and grassy weeds as required. High priority • Prune or thin revegetation to achieve CPTED objectives.
BCZ1	3.1b	CBT	Increase the cover of native ground layer species focussed around areas of higher value (i.e. PCZs and RWZs) Self-sustaining population of *V. derwentia* ssp. *homalodonta* established.	Essential • Do not replace non-local and exotic trees and shrubs when they die. • Annual patrol and control of high threat weeds in areas around PCZs and RWZs to prevent weeds spreading into these higher value areas. • Maintain plantings of *V. derwentia* ssp. *homalodonta* as required, monitor for and protect regeneration. High priority • In conjunction with annual patrol and control, monitor for and mark out areas of higher cover of native ground layer for careful management and potential expansion of PCZs. • Assess the health of the Elm trees and level of regeneration and develop a strategy to manage these. Low priority • Planting of sparse local native shrub species from the agreed list as shelter for small birds in the “corridor” zone.
BCZ2	3.1a	CBT	Native species from PCZ 1 expand into this zone.	Essential • Stop irrigation of these areas. • Spot spray and/or burn along the border with PCZ 1 to encourage natural regeneration. • Reduce mowing frequency and increase height along border with PCZ 1, with timing to avoid mowing while native grasses are setting seed. • Monitor for and record areas of native groundcover for careful management. High priority • Define path around PCZ 1. • Monitor for recruitment of Eucalypts and limit to no more than

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
IRZ1	NA	Hort, TS, Vol.	Horticultural maintenance targets. Improve the diversity of native species and life forms.	Essential • Manage using standard horticultural maintenance approaches. High priority • Plant tree and tall shrub species from vegetation community 3.2 around the perimeter of the wetlands (non-eucalypts only where eucalypts are already planted) keeping an overall open structure. Low priority • Use local native species when establishing new landscaping elements. • Maintain Miyawaki revegetation areas, expand subject to volunteer and Council resourcing. • Assist the native plants to survive and reproduce (particularly restriction of broadleaf herbicide use in some locations to favour Native Sorrel, and timing of mowing to allow seed set of spear grasses and wallaby grasses).

*VC = target Vegetation community

**Resp. = Management responsibility: CBT = CoA biodiversity team, BFL = Bush for Life (Trees for Life) volunteers., PLR = Park Lands Ranger, Cont. = contractors, hort = horticulture, TS = Technical Services, Vol = volunteers

4.3 Key Biodiversity Area 2 (KBA 2)

4.3.1 Background

Location	Veale Park / Walyu Yarta (Park 21) and Golden Wattle Park / Mirnu Wirra (Park 21W)
Precinct	South-West Park Lands Precinct
Other documents	Community Land Management Plan – Annexures 21 & 22 Bush For Life management plan for remnant vegetation site at Golden Wattle Park / Mirnu Wirra (Park 21W)

4.3.2 Description

Figure 2.1 shows the KBA boundary and zones within the KBA 2 and other significant features.

Target vegetation community	0 Grey Box *(Eucalyptus microcarpa*) with SA Blue Gum *(E. leucoxylon* ssp. *leucoxylon*) Woodland – east of Sir Lewis Cohen Ave (Veale Park / Walyu Yarta (Park 21)). 3.4 Mallee Box (*Eucalyptus porosa*) Woodland – west of Sir Lewis Cohen Ave (Golden Wattle Park / Mirnu Wirra (Park 21W)).
Vegetation	This KBA is based around remnants of vegetation, with areas in good condition forming the core and associated vegetation in poorer condition providing opportunities for broad biodiversity outcomes. Zones on the western side (Park 21W) are generally in better condition than those on the eastern side (Park 21), including the buffer zone (BCZ 1) which is classed as in good condition. On the eastern side, two areas of dense revegetation are connected and extended by the buffer zone along the north. The condition of native vegetation in 2024 for each zone is presented in **Table 7**.
Significant features	Veale Gardens and Community garden north of the KBA in Park 21. Dardenelles memorial north of the KBA in Park 21W.
Other Major Uses	Remotely Piloted Aircraft permit area (Veale Park / Walyu Yarta (Park 21)).
Volunteer groups	Bush for Life (Trees for Life).

4.3.3 Zones

Figure 9 shows the zoning for KBA 2 and significant features. The zones are briefly described in **Table 7** from the native vegetation survey (Miles 2024). Note that there have been some changes to the boundaries of the zones since the previous plan: expansion of PCZ 1, PCZ 2 and RCZ 2 and re-alignment of BCZ 2 and IRZ 1.

Table 7 Summary of vegetation communities and condition for each zone (Miles 2024)

Zone type	Zone ID	Vegetation description	Vegetation condition	Comments
Protected conservation	PCZ 1	*Eucalyptus porosa* patches interspersed with Chloris truncata and *Enteropogon acicularis* grasslands	**Good**	Expanded to northern boundary of KBA. High cover of Couch grass in some areas as well as Ribbed Plantain and Scabiosa. Recent revegetation has greatly expanded the species and plant life forms diversity.
	PCZ 2	*Eucalyptus cladocalyx* ssp., Callitris gracilis and E. spp. over *Enchylaena tomentosa* and *Austrostipa* sp.	**Good**	Expanded to east.
	PCZ 3	*Eucalyptus microcarpa* and *E. leucoxylon* ssp. *leucoxylon* revegetation areas over *Acacia* spp. with open grassland	**Good**	Nil
Revegetation conservation	RCZ 1	*Eucalyptus porosa, E. odorata* and *E. microcarpa* over Acacia paradoxa, *Dodonaea viscosa* and *Enchylaena tomentosa*	**Excellent**	The overstorey and midstorey are denser than the target community.
	RCZ 2	*Eucalyptus leucoxylon*, *E. microcarpa* and *E. porosa* over *Acacia paradoxa* and revegetation	**Good**	Expanded to south to include significant vegetation.
	RCZ 3	Closed *Eucalyptus microcarpa* and *E. porosa* revegetated woodland	**Good**	Nil
Buffer conservation	BCZ 1	*Eucalyptus* spp. woodland over *Plantago* sp. and *Rytidosperma* sp.	**Good**	This zone could be re-classified as RCZ 4 if resources for management are available.
	BCZ 2	*Eucalyptus camaldulensis* ssp. *camaldulensis* and *E. porosa* woodland fringing an exotic grassland and oval	**Poor**	Formally mostly oval, realigned to now take in better areas of the IRZ 1 on north side.
Informal recreation	IRZ 1	Fringed plantings of *Eucalyptus camaldulensis* ssp. *camaldulensis* and *E. porosa* with non-local natives around oval	**Moderate**	Re-aligned and zone now includes ovals and mostly non-local plantings on south side.

Figure 9 *Zoning and significant features for KBA 2*

4.3.4 Biodiversity Survey Results

The following is a summary of KBA 2 biodiversity survey results:

- Moderate densities of Brushtail and Ringtail Possums; Brushtail Possums more common in western area (McKenzie 2024) (possibly due to larger trees).
- High diversity of microbats recorded (Rust 2024).
- Chequered Copper Butterfly observed north of the KBA (Ento Search 2024), there are also records from within the KBA in PCZ 1 and in RCZ 2.
- Highest species richness of grassland invertebrates was observed in areas where mowing and slashing is restricted and their presence declined in mown areas (Ento Search 2024).
- Very few bees recorded, however this may be sample bias as trees in areas sampled were very tall (Hogendoorn & Leijs 2024).
- 75% of the area was considered to have vegetation in good to excellent condition (CoA 2024).
- 11 plant species of conservation significance were found, including one of only two individual Mistletoe plants in all the KBAs (Miles 2024).
- Contains highly diverse native grasslands that may be classified as nationally threatened and derived native grasslands of significance.

Figure 10 *Patch of Grey Germander (Teucrium racemossum), a significant species, in PCZ 1*

4.3.5 Management Plan

Aims

Three protected conservation zones to be high quality Mallee Box woodlands and Grey Box - Blue Gum woodlands linked and partially surrounded by high quality revegetated woodlands and buffer conservation zones.

Revegetation conservation zones are carefully planned and managed, contributing positively to native species' population sizes and viability and representing good quality Mallee Box woodlands and Grey Box -Blue Gum woodlands.

Buffer zones will allow for increased populations and/or movement of some species.

The KBA provides habitat for a diverse range of native fauna.

Aboriginal Land Management is implemented across the KBA (see Section 2.1).

Objectives

In addition to the objectives set out in Section 4.1, the following objectives apply to KBA 2:

- To sustain diverse populations of invertebrates and microbats.
- To maintain the diversity of native plant species in Buffer and Informal Recreation zones.

Vegetation management

Non-local eucalypt plantings – historically planted avenues of Sugar Gums and more recent plantings of non-local eucalypts fringing recreation areas are contributing to biodiversity values, particularly Sugar Gums which contain large hollows, as well as most species providing nectar and pollen, habitat structure, leaf litter and fallen timber. There is currently no aim to remove these however they should not be replaced if they die and any seedlings should be removed (seedling Sugar Gums and another unidentified eucalypt were observed).

Pine trees – there are several patches of planted exotic pine trees (*Pinus* spp.) which are unlikely to be contributing any ecological values (Yellow-tailed Black Cockatoos have not been observed in them). Where these do not have heritage value they should be removed and the areas restored to the target vegetation community.

4.3.6 Management Targets and Actions

See also 5-year targets and management actions for all KBAs in Section 4.1.

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
PCZ 1 & PCZ 3	3.1a/ 3.4	CBT	Increase the ratio of native to exotic understorey. Maintain the native species diversity while increasing the cover of herbaceous species	Essential: • Do not replace tree species that are not from the target community when they die. • Remove seedlings of exotic and non-local native trees. High priority • Implement burning and/or mowing for thatch removal of native grass areas periodically to reduce thatch and encourage green growth (i.e. ¼ area each year). • Targeted weeding around significant flora and new understorey revegetation. • Remove exotic trees that do not have heritage values. • Control Cape Tulip, Scabiosa, Salvation Jane, Rice Millet, and Coastal Galenia, working from least infested areas first and ensuring they are replaced with herbaceous natives. • Monitor Mistletoe, if no new plants appear, undertake hand propagation using Adelaide Plains provenance seed. Low • Undertake intensive grassland revegetation (scrape method) in the northern part of the PCZ. • In open grassy areas, plant widely spaced (e.g. 30 m apart) overstorey and mid-storey from the target communities, if they fail to regenerate, target species that are not already present (e.g. *Santalum acuminatum*). • Undertake further mistletoe “seeding” on Acacia species, monitor and assess results.
PCZ 2	3.1a	BFL	Maintain and expand area of high quality native ground layer	Essential • Implement BFL plan. • Remove Casuarina and Olive (seedling) and any seedlings of non-local trees. High • Confirm if native Allocasuarina or exotic Casuarina are regenerating and remove if the latter. Low • Remove Aleppo Pines, non-local Melaleuca and eucalypts (except Sugar Gum).
RCZ 1	3.1a/ 3.4	CBT	Increase the cover and diversity of native ground layer species. Reduce the density of midstorey to less than 25%	Essential: • Do not replace tree or shrub species that are not from the target community when they die. • Control grassy and herbaceous weeds (for RCZ 1) along boundary with PCZ 1 & PCZ 3 to encourage spread of species from those areas into this. • Selectively remove or prune midstorey plants to achieve a more open shrub layer (aim for 25% and focus on removing species not on the target list e.g. *A. paradoxa*). High priority
RCZ 2		CBT		
RCZ 3		CBT		

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
				• Plant patches of non-grassy ground layer where midstorey removed. • Control Olives, Desert Ash, Rhamnus and South African Daisy in RCZ 3. Low • Plant widely spaced (e.g. 30 m apart) overstorey and mid-storey from the target communities if they fail to regenerate or are not already present (e.g. *Santalum acuminatum*). • Selectively thin the tree canopy (especially in RCZ 2 and RCZ 3) to achieve cover of 30% and remove species not from target communities.
BCZ 1	3.1a to 3.4	CBT	Increase the cover and diversity of native ground layer species. Reduce the weed threat to adjacent PCZs and RCZs	Essential: • Do not replace tree or shrub species that are not from the target community when they die. • Remove seedlings and suckers of non-local natives. • Control South African Daisy, *Acacia saligna* and Boxthorn. High priority • Selectively remove or prune midstorey and overstorey plants to achieve a more open shrub layer and tree canopy (aim for 25% cover at most each and focus on removing species not on the target list e.g. *A. paradoxa*). • Remove Casuarinas. • Map areas of high native grass cover and implement selective mowing or other strategy to expand patches of native grass. Low • Control high threat grassy and herbaceous weeds working within and along boundaries of PCZs and RCZs.
BCZ 2		CBT		
IRZ 1	NA	CBT	Increase the cover of native ground layer species	High priority • Restrict use of broadleaf selective herbicides to encourage native herbaceous species. • Timing and height of mowing to allow seed set of native grasses. • Monitor for regeneration of native species and adjust management accordingly to promote.

*EC = target Vegetation community, in particular see Generalised profile structure figure 8.1 for EC 8.1a and 8.2 for 8.1b

**Resp. = Management responsibility: CBT = CoA biodiversity team, BFL = Bush for Life (Trees for Life) volunteers

4.4 Key Biodiversity Area 3 (KBA 3)

4.4.1 Background

Location	Denise Norton Park / Pardipardinyilla (Park 2) Yam Daisy Park / Kantarilla (Park 3) Reservoir Park / Kangatilla (Park 4) Bragg Park / Ngampa Yarta (Park 5)
Precinct	North Park Lands Precinct
Other documents	Nil

4.4.2 Description

Figure 11 shows the KBA boundary and zones within the KBA with other significant features.

Target vegetation communities	3.5 Mallee Box (*Eucalyptus porosa*) Woodland in North Adelaide
Vegetation condition	Most of the vegetation has been assessed as in moderate condition, primarily comprising plantings of local native, Australian native and exotic trees with a predominantly exotic ground layer. A key feature is locally significant remnant native grasses and daisies in PCZ 1 which have been a focus for management. Two of the ex-playing fields has been planted with tree and shrub species from the target community and have a diverse native ground layer (RCZ 1 & RCZ 2).
Significant features	Investigating closure of Lefevre Road and returning this area to Park Lands purpose is flagged as a consideration in the Adelaide Park Lands Management Strategy (CoA 2025). This would benefit the KBA by joining BCZ 4 with BCZ 3, reducing the fragmentation of this KBA. A Carbon Offset demonstration site was established in 2021 in IRZ 1 and this area is now designated as an RCZ.
Other Major Uses	• Park 2 contains the Adelaide Aquatic Centre. • Tennis Courts located in BCZ 1. • Dog park adjacent to BCZ 4, dog owners walk through to get to park.
Volunteer groups	• North Adelaide Primary School • Youth Options • TafeSA • Rotary Club • Bush for Life.

4.4.1 Zones

Table 8 *Summary of vegetation communities and condition for each zone (Miles 2024)*

Zone type	Zone ID	Vegetation description	Vegetation condition	Comments
Protected conservation	PCZ 1	Exotic and non-local-native woodland over mixed exotic and native grasses	**Moderate**	Cover of native species is low but area expanded.
Revegetation conservation	RCZ 1	*Eucalyptus porosa* +/- *E. leucoxylon* low open woodland over *Austrostipa scabra* and *Cynodon dactylon*	**Moderate**	The weed Caltrop is a problem in this area and the focus of management.
	RCZ 2	*Eucalyptus porosa* +/- *E. socialis* and *Callitris gracilis* open mallee / woodland over open grassland	**Good**	This area has been a focus for management.
	RCZ 3	*Eucalyptus leucoxylon* open woodland over *Enchylaena tomentosa* and native shrub revegetation	**Moderate**	High native species cover and diversity but lacking tree habitat.
Buffer conservation	BCZ 1	*Eucalyptus cladocalyx, E. camaldulensis* and *E. leucoxylon* sp. over exotic and native grasslands	**Moderate**	Nil
	BCZ 2	Mixed *Eucalyptus* spp. and *Callitris gracilis* woodland over revegetated shrubs	**Moderate**	Nil
	BCZ 3	*Eucalyptus cladocalyx, E. microcarpa* +/- *E. odorata* woodland over exotic flora	**Poor**	Nil
	BCZ 4	*Eucalyptus leucoxylon, E. microcarpa and E. porosa* and non-local-natives over exotic grasses and *Austrostipa* spp.	**Moderate**	Area north and east of this zone contains moderately diverse revegetation and could be included in this zone.
Informal recreation	IRZ 1	Old *Eucalyptus* sp. canopy reveg over mown old oval / *Cynodon* sp. grassland	**Moderate**	Nil

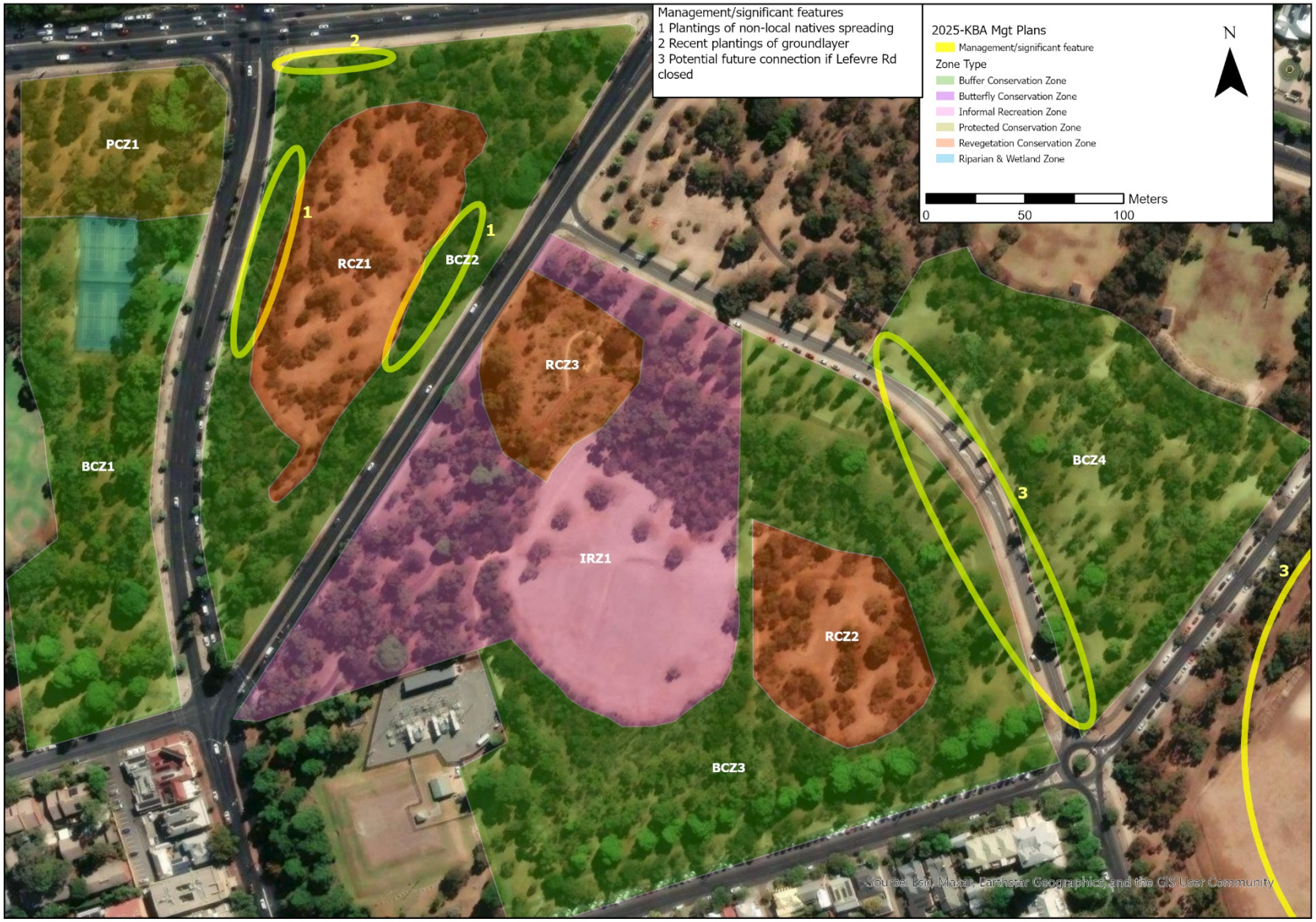

Figure 11 *Zoning* and significant features *for KBA 3*

Figure 12 Native grasses in RCZ1

4.4.2 Biodiversity Survey Results

The following is a summary of the KBA 3 biodiversity survey results:

- Low numbers of Brushtail and Ringtail Possums (McKenzie 2024).
- High diversity of microbats recorded (Rust 2024).
- Chequered Copper Butterfly observed in Park 4 and Park 5 (Ento Search 2024).
- High diversity of invertebrate species associated with grassland and shrub/tree foliage areas (Ento Search 2024).
- Third highest bee diversity and numbers observed of all KBAs surveyed for bees (Hogendoorn & Leijs 2024).
- 11% of the area was considered to have vegetation in good to excellent condition (CoA 2024).
- 6 remnant and 4 planted flora species of conservation significance were recorded (Miles 2024).

4.4.3 Species of conservation significance

Species of conservation significance known to be present in KBA 3 are listed in **Appendix 1**. Regionally significant Broughton Willow is present in the revegetation areas but not considered part of the target communities and therefore not listed here. Significant grass species in PCZ 1 had spread into parts of the adjacent BCZ 1 in 2024 and these areas have subsequently been reclassified as part of the PCZ.

4.4.4 Management Plan

Aims

One protected conservation zone preserving remnant understorey of Mallee Box woodland (North Adelaide form) linked by buffer zones that have multiple uses and contain substantial populations of native flora to revegetation zones.

Revegetation conservation zones will have been carefully planned and managed and will be contributing positively to native species' population sizes and viability and represent good quality Mallee Box woodlands (North Adelaide form).

The KBA provides habitat for a diverse range of native fauna.

Aboriginal Land Management is implemented across the KBA (see Section 2.1).

Objectives

In addition to the objectives set out in Section 4.1, the following objectives apply to KBA 3:

- To improve connectivity between high value native vegetation areas.
- To maintain high invertebrate and microbat diversity and increase the population and distribution of Chequered Copper Butterfly.

4.4.5 Management Targets and Actions

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
PCZ 1	3.5	CBT	Increase the cover of significant native flora. Increase the total native species cover and diversity	Essential: • Encourage survival and recruitment of understorey species, with an emphasis on non-grass species, including spot weeding of Kikuyu, Coastal Galenia and Fountain Grass. • Do not replace tree and shrub species not from the target community when they die. High priority: • Remove species not from community 3.5 (except mature overstorey). • Plant a small number of trees (2-4) and shrubs (5-10) appropriate to the target species composition and structure. Low Priority • Planting of additional ground layer grass and herbaceous species from the target community.
RCZ 1 & RCZ 2	3.5	CBT	Increase the cover and diversity of native ground layer, focussing on non-grass species	Essential: • Reduce thatch amongst grass tussocks to increase open space and promote native grass germination. • Do not plant more trees or large shrubs. • Encourage survival and recruitment of ground layer species, with an emphasis on non-grass species (follow techniques from PCZ 1 Site Maintenance Plan). • Control perennial grassy (i.e. Couch) and herbaceous weeds (i.e Caltrop, Scabiosa, Coastal Galenia), working from areas of highest native cover first. • Control non-native species spreading from adjacent BCZs. High priority: • Thin or prune lower branches of large shrubs/small trees to achieve CPTED objectives; may remove entire plants of *Acacia paradoxa*. • Monitor for regeneration of shrub species and remove if shrub cover increases above 20%, targeting *Acacia paradoxa*. • Revegetate with ground layer species from target community, particularly non-grass species. Low • Remove overstorey species not from target community (e.g. *E. camaldulensis* in RCZ 1).
RCZ 3	3.5	CBT	Native species cover and diversity maintained. Structure developing towards target community	Essential: • Encourage survival and recruitment of ground layer species; control medium and high weeds through planting areas (as per regional weed threat ratings, National Vegetation Classification 2024. High priority: • Remove regeneration of overstorey species not from target community (e.g. E. camaldulensis).

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
				• Thin or prune lower branches of large shrubs/small trees to achieve CPTED objectives adjacent to trails. • Monitor for regeneration of medium-large shrub species and remove if shrub cover increases above 25%. Low • Expand zone into adjacent IRZ areas through revegetation and monitoring for and weeding around regeneration.
BCZ 1 to BCZ 4	3.5	Hort	Increase the cover and diversity of native ground layer species. Reduce the weed threat to adjacent PCZs and RCZs	Essential: • Do not replace tree or shrub species that are not from the target community when they die. • Remove seedlings and suckers of non-local native and exotic trees, with priority to boundaries with RCZs and PCZ. • Control high threat grass and herbaceaous weeds, including Caltrop, Coastal Galenia, Kikuyu and Couch, Scabiosa, African Daisy and Feather Grasses. High priority • Remove Casuarinas, non-local Acacia and exotic tree species that are suckering/regenerating. • Map areas of high native grass cover and implement selective mowing or other strategy to expand patches of native grass (or implement high mowing during Mid-spring-Summer throughout). Low • Control high threat grassy and herbaceous weeds working along boundaries with PCZs and RCZs.
IRZ 1	3.5		Increase the cover of native ground layer species	Essential • Control high threat weeds along boundary with RCZs. High priority • Timing and height of mowing to allow seed set of native grasses and avoid damage to other native understorey. • Do not replace tree and shrub species that are not from the target community when they die. Low priority • Investigate potential scrape revegetation technique in former oval area. • Plant widely spaced (i.e. 30 or more metres apart) tree species from the target community into former oval if not proceeding with scrape revegetation.

*EC = target Vegetation community

4.5 Key Biodiversity Area 4 (KBA 4)

4.5.1 Background

Location	Lefevre Park / Nantu Wama (Park 6)
Precinct	North Parklands Precinct
Other documents	BFL plan (site AD001)

4.5.2 Description

Figure 14 shows the KBA boundary and zones within the KBA with other significant features.

Target vegetation communities	3.2 SA Blue Gum (*Eucalyptus leucoxylon* ssp. *leucoxylon*) / River Red Gum (*E. camaldulensis* ssp. *camaldulensis*) Woodland and 3.5 Mallee Box (*Eucalyptus porosa*) Woodland in North Adelaide The previous Management Plan recommended for this area to be targeted towards 3.5, however as the better areas of the site more closely resemble the 3.2 community and this community is likely to be more amenable to CPTED objectives, the 3.2 community is considered an appropriate target community along the southeastern boundary.
Vegetation condition	There are two PCZs, with PCZ 1 in good condition, having an overstorey of large old eucalypts and moderate cover and excellent diversity of native ground layer species resulting in an overall representation of open grassy woodland. PCZ 2 has high diversity of species and plant life forms but is dominated by exotic grasses, the zone has been extended slightly to the north east to take in an area of native ground layer, while the more degraded areas have been re-classified as a new BCZ. The KBA has been extended north of this and to fully surround the horse yards to include some revegetation areas. BCZ 1 has a good diversity but low cover of native species. BCZ 2 was previously classed as an RCZ however no revegetation appears to have taken place and the area is not considered a priority to revegetation, therefore it has been reclassified.
Significant features	PCZ 2 is a Bush for Life site (AD001). Threatened species have recently been planted into the site. The KBA is surrounded by horse agistment paddocks, yards and riding areas. Unlike other KBAs, private residences are close-by across a single lane road.
Other Major Uses	Horse agistment in adjacent areas.
Volunteer groups	Bush for Life (Trees for Life),

Table 9 *Summary of vegetation communities and condition for each zone (Miles 2024)*

Zone type	Zone ID	Vegetation description	Vegetation condition	Comments
Protected conservation	PCZ 1	*Eucalyptus. camaldulensis* spp. *camaldulensis, +/- E. cladocalyx* spp. over *E.* spp. revegetation and *Austrostipa* spp.	**Good** (52.81)	Nil
	PCZ 2	*Eucalyptus* spp. over *Enchylaena tomentosa* & grasses	**Moderate** (45.34)	Original area extended around horse yards; low cover of native species.
Buffer	BCZ 1	*Eucalyptus cladocalyx* spp., *E. camaldulensis* spp. *camaldulensis*, Non-native *E.* over *Cynodon sp.*	**Moderate**	Native grasses scattered through.
	BCZ 2	*Eucalyptus cladocalyx* spp., *+/- E. leucoxylon* spp. *leucoxylon +/- E. camaldulensis* spp. *camaldulensis* over grasses & herbs	**Poor**	Formerly classed as an RCZ however no significant revegetation has taken place.

Figure 13 *River Red Gums with native grass understorey in PCZ 1*

Figure 14 *Zoning and significant features for KBA 4*

4.5.3 Biodiversity Survey Results

The following is a summary of the KBA 4 biodiversity survey results:

- Moderate densities of Brushtail and Ringtail Possums (McKenzie 2024) (possibly due to larger trees).
- Moderate diversity of microbats recorded (Rust 2024).
- Chequered Copper Butterfly observed in horse paddocks north of the KBA (Ento Search 2024, ALA records).
- Highest levels of invertebrate diversity associated with grasslands and shrub/tree foliage (Ento Search 2024).
- Very few bees recorded, however this may be sample bias as trees in areas sampled were very tall but there was also limited flowering native groundcovers and mostly introduced plans (Hogendoorn & Leijs 2024).
- 25% of the area was considered to have vegetation in good to excellent condition (CoA 2024).

The KBA was extended around horse yards and north of PCZ 2 as a result of the surveys.

4.5.4 Management Plan

Aims

Two protected conservation zones to be high quality areas of SA Blue Gum and Mallee Box grassy woodlands, linked by buffer zones that have multiple uses and contain substantial populations of native flora.

The KBA provides habitat for a diverse range of native fauna.

Aboriginal Land Management is implemented across the KBA (see Section 2.1).

Objectives

In addition to the objectives set out in Section 4.1, the following objectives apply to KBA 4:

- To extend areas of high quality native vegetation.

- To increase the diversity and numbers of native fauna management

Vegetation Management

Sugar Gum Plantings – The KBA has high tree cover, comprised of many large planted eucalypts that are not locally indigenous (including many Sugar Gums *Eucalyptus cladocalyx*), as well as exotic species. It is accepted that, in the interim, these non-local trees provide only the structural component of this layer and the majority of large hollows, and that the species will be different from the pre-European vegetation.

European Rabbits - There are diggings and droppings throughout the zone indicating that European Rabbits are present. Rabbits are declared species under the *Landscapes SA Act 2019* (SA) requiring their control and threatened the re-establishment of native vegetation. These need to be controlled across the site using methods appropriate to the urban setting.

Horse paddocks – As noted above, Chequered Copper Butterflies have been recorded in the horse paddocks northwest of the KBA, indicating that the current grazing management is compatible with their presence. Enhancing the habitat for the species within the KBA is recommended to promote the butterfly's population viability. Planting of widely spaced trees from the target communities within the paddocks (i.e. as per TFL Paddock Trees project) may assist in providing connectivity for fauna between KBA 3 & KBA 4 while benefitting the horses by providing shelter.

4.5.1 Management Targets and Action

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
PCZ 1	3.2 – 3.5	CBT	Maintain high native ground layer cover. Increase the diversity of herbaceous species. Maintain very open midstorey (<5% cover)	Essential: • Encourage survival and recruitment of understorey species, with an emphasis on non-grass species, including spot weeding of high threat weeds (e.g. Couch, Kikuyu, Coastal Galenia, Caltrop and African Daisy) working from areas of highest native cover first. • Monitor for and control regeneration from exotic and non-local trees and garden escapees (e.g. Gazania). • Do not replace exotic and non-local trees when they die. High priority: • In areas with low native species cover, plant small areas densely with herbaceous species missing from the target communities (e.g. *Liliaceae* and *Compositae*). • Rabbit management required (warrens present on western border of PCZ 1). • Remove thatch and fallen fine timber to manage fuel loads. Low priority: • Plant low numbers of mid storey species from the target communities in areas with low native groundcover, maintaining open structure. • Remove weed species from verge plantings, engage with residents to establish local natives in gardens and verges.
PCZ 2	3.2-3.5	BFL & CBT	Increase the cover and diversity of native ground layer species	Essential: • Manage according to Bush for Life Plan. • Do not replace exotic and non-local trees when they die. High priority: • In areas with low native species cover, plant small areas densely with herbaceous species missing from the target communities (e.g. *Liliaceae* and *Compositae*). • Remove mature non-local native and exotic trees that are regenerating / suckering (e.g. *Casuarina* spp.) in stages, replacing with species from the target community (where required).
BCZs	3.2-3.5	CBT	Increase the cover and diversity of native ground layer species, especially in corridor between PCZs.	Essential • Control high threat woody weeds and exotic trees (including Robinia, Boxthorn, Horehound, Olives, Desert Ash) and regeneration of non-local natives (e.g. Sugar Gums and Casuarinas). • Do not replace exotic and non-local trees when they die. • Mowing and weed control sympathetic to encouraging native ground layer.

			Reduce the weed threat to adjacent PCZs.	High priority • Control high threat perennial grass and herbaceous weeds, prioritising boundaries with PCZs. • Remove mature non-local native and exotic trees that are regenerating / suckering (e.g. *Casuarina* spp.). Low priority • Where trees have been removed or die, replace with tree and midstorey species from the target communities. • Plant *Oxalis perennans* in areas adjacent to horse paddocks.

*EC = target vegetation community.

**Resp. = Management responsibility: CBT = CoA biodiversity team, BFL = Bush for Life (Trees for Life) volunteers

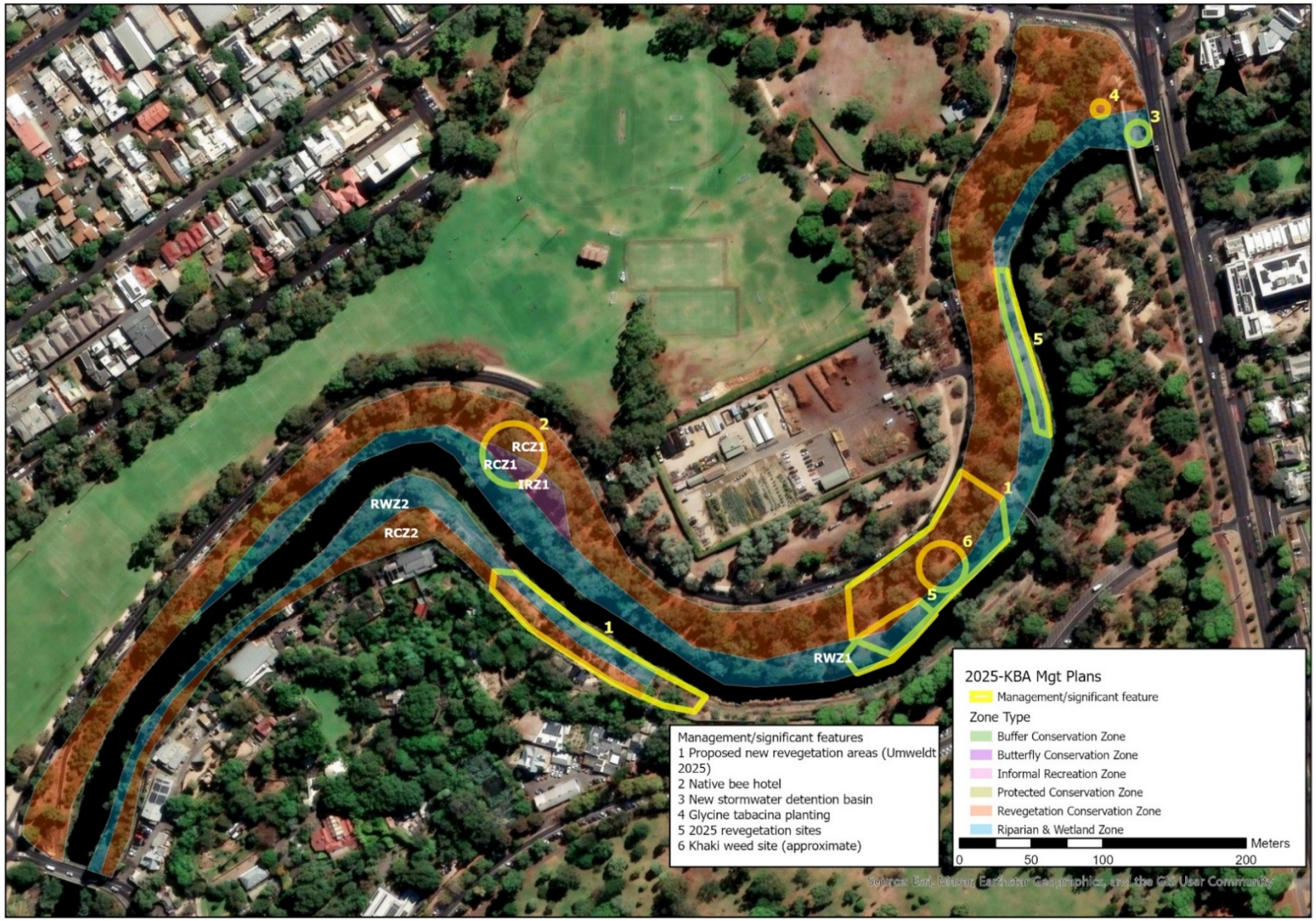

Figure 15 *Zoning* and significant features *for KBA 5*

Figure 16 *High diversity revegetation in RCZ 1Zones*

4.5.2 Biodiversity Survey Results

The following is a brief summary of the KBA 5 biodiversity survey results:

- Ringtail and Brushtail Possums, Rakali, Grey-headed Flying Fox, Eastern Water Skink and Garden Skink recorded (Taylor et al. 2024).
- Since 2020 there has been a reduction in the extent of aquatic vegetation throughout the "lake" portion of Karrawirra Pari, and through KBA 5 the only aquatic vegetation recorded was a 200 m stretch of submerged River Eel-grass (*Vallisneria australis*) immediately below Hackney Road Bridge (Taylor et. al 2024)[3].
- Moderate-high diversity of microbats (Rust 2024).
- A high diversity of invertebrates associated with the bank revegetation areas, with two species recorded for the first time in the urban parts of Adelaide (EntoSearch 2024).
- Fourth highest diversity and numbers of native bees (Hogendoorn & Leijs 2024).

[3] The area of the river itself is not actually part of the KBA area.

- 60% of KBA 5 has native vegetation in good to excellent condition (Miles 2024).

4.5.3 Management Plan

Note: this management plan only relates to the riparian and bank zones and not the management of the water-body itself.

Aims

To improve the River Torrens/ Karrawirra Pari riparian environment as an ecological corridor, core habitat and refugia.

The banks of the River Torrens/ Karrawirra Pari to be vegetated with high quality riparian River Red Gum woodlands and the upper banks representing diverse woodlands.

Lawned areas provide spaces for people to access and enjoy the riverine environment.

The KBA provides habitat for a diverse range of native fauna.

Aboriginal Land Management is implemented across the KBA (see Section 2.1).

Objectives

In addition to the objectives set out in Section 4.1, the following objectives apply to KBA5:

- To increase the diversity and numbers of native fauna (particularly birds and mammals).

Vegetation management

While the plan is focussed on the non-aquatic environment, improvements in water quality and environmental flows (including variations in water level) are recommended to achieve the Aim and objectives (above).

As the linear trails are a high use commuter and recreational route, maintaining lines of sight along the trail is important for the safety of users. Areas adjacent the trail may remain as a combination of exotic lawns and overstorey revegetation with an open middle layer, and limited ground layer vegetation to minimise human – wildlife collisions. Denser mid-storey and understorey may be planted in patches away from the trail where sight lines won't be impacted.

In some locations, the slopes above the banks are steep and pose a high-risk work environment for establishing and maintaining revegetation. Some of these areas require re-planting for the purpose of stabilisation, and this will be outsourced to suitable contractors. Elsewhere, steep slopes will not be included in restoration works in the medium term; this may be reconsidered in five years.

There are many historical plantings; species that are considered to pose a weed risk are recommended for removal while other species not considered part of the target vegetation communities can be retained but should not be replaced if they die.

Vegetation management should be guided by the Pest and Biodiversity Management Plan (Umweldt 2025). Weed control will be an on-going requirement as propagules are brought in from the catchment upstream, including previously controlled and new species. Occasionally native species may also establish and therefore new species should be thoroughly identified prior to control.

Both exotic and native species of the Genus' *Calystegia* and *Callistemon* are present that are difficult to distinguish, identification and control should be targeted to seasons when the species are flowering and can be most easily distinguished (or at least locate and mark the exotic species for later control).

The recommendation to plant widely spaced overstorey and subcanopy species on the river banks should be implemented on the Botanic Gardens side of the river and downstream of the KBA to extend the area of riparian habitat and provide better connectivity to KBA 6.

4.5.4 Management Targets and Actions

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
RCZ 1	3.2 / 3.5	CBT	Maintain high diversity and cover of native understorey. Maintain low weed threat.	Essential: • Remove Olives, Giant Reed, Casurarina spp. and Desert Ash and in RCZ 2 Boxthorn, Bamboo, Tree of Heaven and Robinia. • Regularly patrol for and control high threat weeds (including Khaki weed) and regeneration of exotic and non-local tree species. • Do not replace trees when they die. High priority: • Spot weed Coastal Galenia, Kikuyu, Cleavers and other high threat herbaceous and grassy weeds, working from areas of best understorey first. • Remove Date Palms, Casuarina's, Pines, non-local Bottle-brush, Peppercorn trees and all other exotic trees without heritage values or tree hollows. • No further mulching. Moderate/low priority: • Remove dead wattles and eucalypts where there are high levels of die-off to manage fuel loads. RCZ 1 may be re-classified as a PCZ in future revisions of the plan.
RCZ 2	3.2	CBT	Reduce weed threat and cover. Increase the cover and diversity of grassy and herbaceous species.	
RWZ 1 **RWZ 2**	3.3 3.3	CBT	Weed threat reduced. Increased native vegetation cover and structural and species diversity.	Essential: • Implement actions in Umweldt (2025), especially removal of, patrol for and control of high threat woody and herbaceous weeds. • Control *Cyperaus eragrostis*, with priority given to preventing seed set. • Control *Callistemon viminalis viminalis* and regularly patrol and control (locate and distinguish from local *Callistemon sieberi* in Spring when flowering). High priority: • Confirm locations of exotic *Calystegia* sp. and treat accordingly. • Control Madeira Vine in RWZ 2, working from upstream to downstream. • Remove Casuarinas and other non-local native and exotic trees without heritage values. Moderate/low priority: • Undertake wide-spaced planting of overstorey and tall subcanopy species in exotic grass areas, taking care to maintain lines of sight and CPTED principles. • Where space permits, plant mid-storey species (e.g. *Callistemon sieberi* and *Leptospermum lanigerum*) close to water's edge. • Install artificial hollows of a range of sizes in larger trees.

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
IRZ1	NA	CBT	Horticultural maintenance targets	Essential • Manage using standard horticultural maintenance approaches. Low • Use local native species when establishing new landscaping elements.

*EC = target vegetation community.

**Resp. = Management responsibility: CBT = CoA biodiversity team, BFL = Bush for Life (Trees for Life) volunteers

4.6 Key Biodiversity Area 6 (KBA 6)

4.6.1 Background

Location	John E Brown Park (Park 27A)
Precinct	Bonython Park Precinct
Other documents	• Community Land Management Plan – Annexure 31 • River Torrens Pest and Biodiversity Management Plan (Umweldt 2025) – Action Plan 8.8

4.6.2 Description

Figure 18 shows the KBA boundary and zones within the KBA with other significant features.

Target vegetation communities	3.3 *Eucalyptus camaldulensis* (River Red Gum) Woodland along the creeks and river systems – adjacent to river and lower banks 3.2 SA Blue Gum (*Eucalyptus leucoxylon* ssp. *leucoxylon*) / River Red Gum (*E. camaldulensis* ssp. *camaldulensis*) Woodland – mid-banks 3.5 *Mallee Box* (*Eucalyptus porosa*) Woodland in North Adelaide - upper banks and flats adjacent to linear trail
Vegetation overview	This KBA is based around significant areas of revegetation along the banks of the river and adjacent stopes. There is very little remnant vegetation present in this community, and historic clearing, grazing and erosion of the river, together with changes in the flow regime have brought about significant changes in the riverine environment. The revegetation efforts along the river have resulted in a highly diverse riparian plant community representative of the descriptions of the river in the early 1800's (see Ch. 5, Kraehenbuehl 1996). Vegetation on the lower banks includes native species that grow densely during Spring early Summer (e.g. *Sigesbeckia orientalis* and *Phragmites australis*) requiring occasional brushcutting to maintain access to control weeds and for CPTED. The condition of native vegetation in 2024 for each zone is presented in **Table 11**.
Significant features	Two of the zones are on "islands" and inaccessible during high flows. The river banks become increasingly steep downstream making the lower (northern) banks difficult to access for restoration or maintenance and the vegetation condition in these areas is consequently poorer than the more accessible areas. Occasional floods occur and can cause erosion, uproot plantings, deposit silt, organic matter and rubbish, while regular flows bring an on-going supply of weed seeds from the catchment. Construction of the Torrens Weir upstream of KBA 5 in 1881 has reduced surface flows to this section of the river with additional changes in catchment run-off quality and regime.
Volunteers	There are no formal volunteer groups with on-going management of this KBA.

4.6.3 Zones

Figure 18 shows the zoning for KBA 6 and significant features. The zones are briefly described in **Table 11**; the downstream end of the KBA is in poorer condition due to the steepness of the banks limiting access (Miles 2024).

Table 10 *Summary of vegetation communities and condition for each zone (Miles 2024)*

Zone type	Zone ID	Vegetation description	Vegetation condition	Comments
Revegetation conservation	RCZ 1 & RCZ 2 "Equestrian" and "Brewery"	*Eucalyptus cladocalyx* spp. over *E. camaldulensis* sppspp. *camaldulensis, E. porosa,* over *Acacia pycnantha, Callitris gracilis over Enchylaena tomoentosa*	**Good**	Upper banks tending to more dryland while lower more riparian. RCZ 4 (Brewery-side) is not as good condition with less diverse revegetation in discrete beds in accessible areas.
Riparian and Wetland	RWZ 1 "Bunyip"	*Eucalyptus camaldulensis* sppspp. *camaldulensis* over *Acacia spp. and Leptospermum lanigerum*, over *Cyperus vaginatus*, *Dichondra repens*, Kikuyu	**Excellent**	Excellent example of closed riparian forest but declines in downstream reach due to steep slopes limiting access.
	RWZ 2 & RWZ 3	*Eucalyptus camaldulensis* sppspp. *camaldulensis* over *Acacia provincialis, A. melanoxylon* over Kikuyu & *Calystegia sepium*	**Poor**	RWZ 3 was inaccessible at the time of the survey but appears similar to RWZ 2.
Informal recreation	IRZ 1	*Eucalyptus camaldulensis* sppspp. *camaldulensis* over exotics, Kikuyu in *Phragmites australis & Calystegia sepium*	**Poor**	Nil

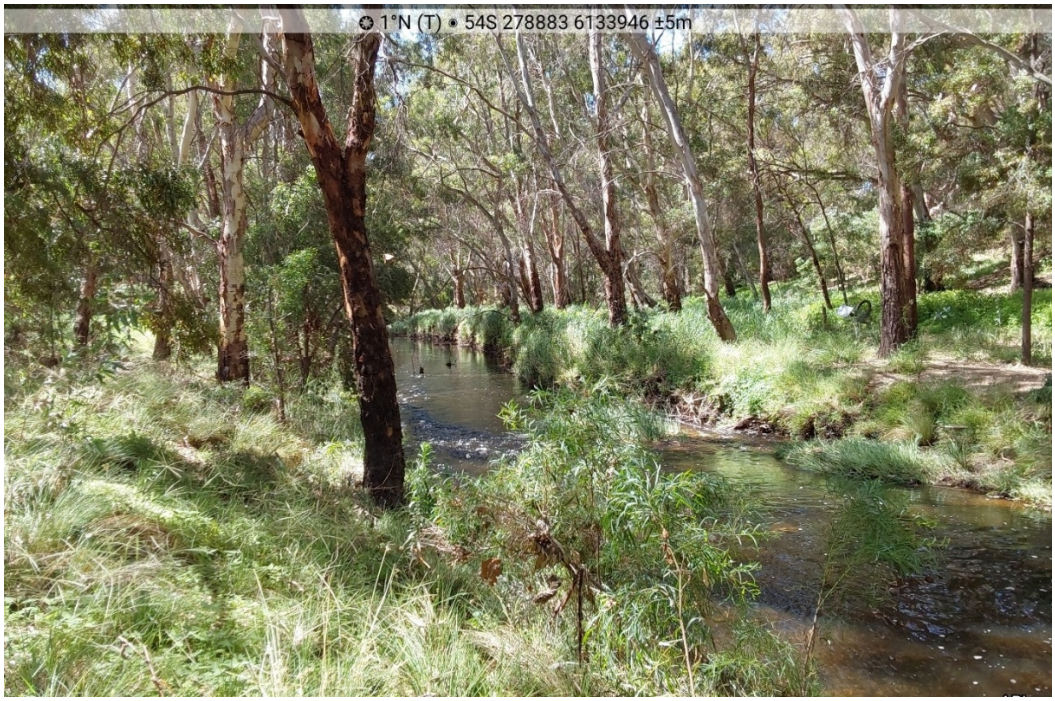

Figure 17 *Excellent condition riparian vegetation*

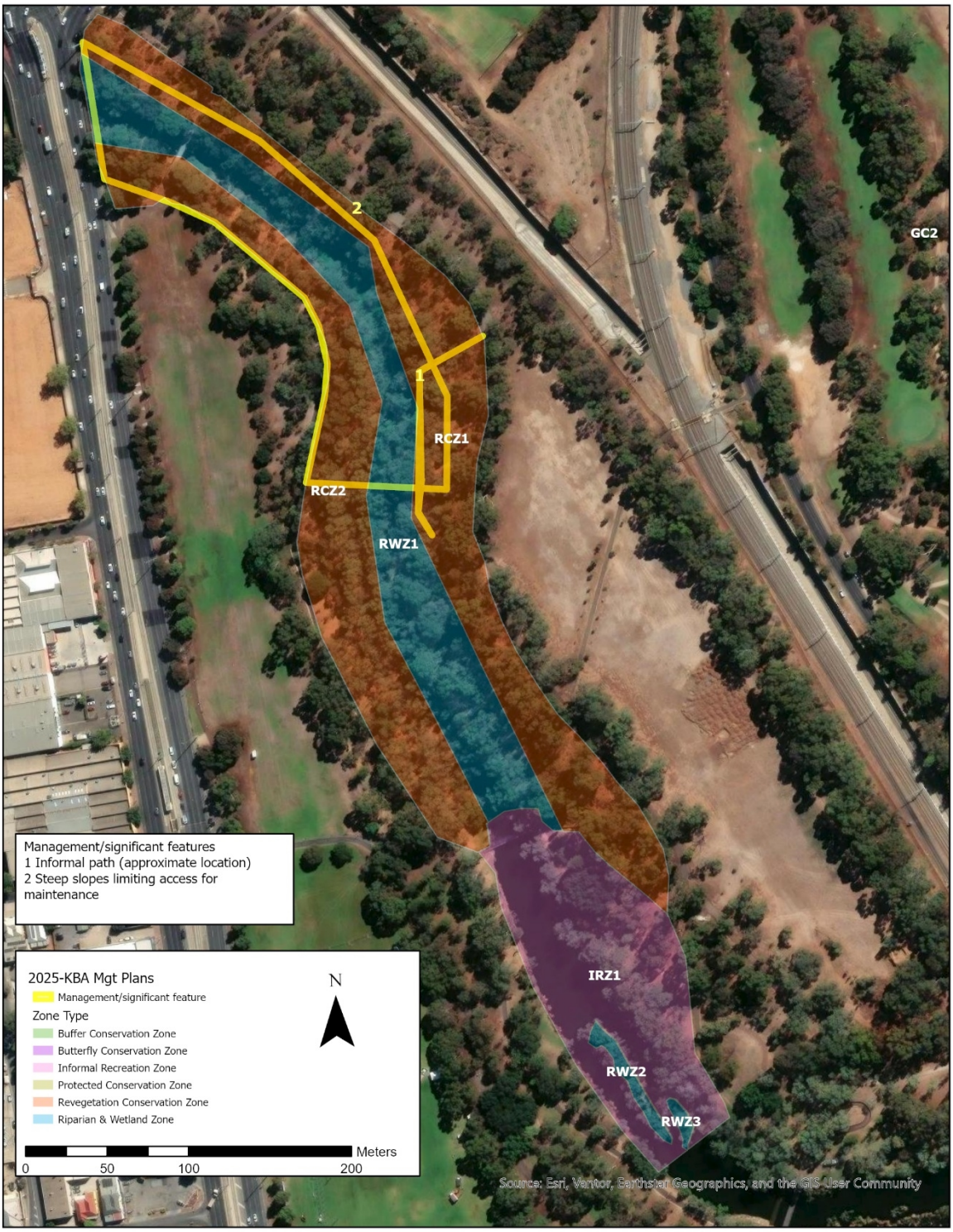

Figure 18 *Zoning* and significant features *for KBA 6*

4.6.4 Biodiversity Survey Results

The following is a brief summary of the KBA 6 biodiversity survey results:

- Edges have diversity of vegetation associations and variable wetland vegetation grading to floodplain vegetation; natural lotic hydrology, with shallow pool-riffle sequence (Taylor et al. 2024).
- Low-moderate microbat diversity (Rust 2024).
- Very few bees (Hogendoorn & Leijs 2024) which was attributed to there being many introduced plants (this is in contrast to the vegetation results, therefore the survey area may have been different).
- Very high diversity of invertebrate species associated with the river bank and understorey vegetation in shaded/partly shaded areas as well as chenopod understorey on upper banks; the Bunyip Trail area had the highest invertebrate diversity (EntoSearch 2024).
- Two thirds of the KBA are in good to excellent condition; several regionally significant plant species occur naturally in the riparian zone (Miles 2024).

4.6.5 Management Plan

Aims

To improve the River Torrens/ Karrawirra Pari riparian environment as an ecological corridor, core habitat and refugia.

The banks of the River Torrens/ Karrawirra Pari to be vegetated with high quality riparian River Red Gum woodlands and the upper banks representing diverse woodlands.

A space for people to enjoy and engage with nature.

The KBA provides habitat for a diverse range of native fauna.

Aboriginal Land Management is implemented across the KBA (see Section 2.1).

Objectives

In addition to the objectives set out in Section 4.1, the following objectives apply to KBA 6:

- Increase the number and diversity of fauna species (particularly birds and mammals).
- Provide an area for people to engage with nature.

Vegetation management

Vegetation management should be guided by the Pest and Biodiversity Management Plan (Umweldt 2025). Weed control will be an on-going requirement as propagules are brought in from the upstream catchment, including previously controlled and new species. Occasionally native species may also establish and therefore new species should be thoroughly identified prior to control.

Both exotic and native species of the Genus' *Calystegia* and *Callistemon* are present that are difficult to distinguish, identification and control should be targeted to Spring when the species are flowering and can be most easily distinguished (or at least locate and mark the exotic species for later control).

The recommendation to plant widely spaced overstorey and subcanopy species on the river banks in KBA 5 should be implemented between KBA 5 and KBA 6 to extend the area of riparian habitat and provide better connectivity to KBA 5.

As noted above the downstream parts of the KBA are difficult to maintain due to the steep slopes above water. It is recommended to investigate options for managing steeper banks, potentially using contractors with training and equipment for steep sites. These areas are not included in the restoration works at this time; this may be reconsidered in five years.

Flood response

Flood events will occur from time to time. The KBA will need to be assessed following each event and infrastructure repairs, rubbish collection, revegetation and removal of woody debris planned accordingly.

Figure 19 *Steeply sloping banks at the downstream end of KBA 6*

4.6.6 Management Targets and Actions

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
RCZ 1	3.2 / 3.5	CBT	Maintain high diversity and cover of native understorey. Reduce the weed threat.	Essential: • Regularly patrol for and control high threat weeds and regeneration of exotic and non-local tree species. • Do not replace non-local trees when they die. High priority: • Spot weed, slash or mow herbaceous and grassy weeds, working from areas of best understorey first. • RCZ 2: monitor for regeneration of species from the target community around planting beds and mark to mow around these in consultation with Horticulture team. Moderate/low priority: • RCZ 2: Revegetation of additional ground layer species in revegetation beds. • RCZ 2: Extend revegetation beds targeting missing species and structural elements.
RCZ 2	3.2	CBT	Increase the diversity and cover of native species within defined planting areas. Reduce the weed threat.	
RWZ 1	3.3	CBT	Increase the cover of native understorey (except *Phragmites australis*) and reduce the weed threat.	Essential: • Regularly patrol for and control high threat herbaceous weeds (including *Bidens pilosa, Cyperaus eragrostis*, and *Xanthium* sp.), exotic and non-local trees (especially Ash) and woody weeds. • Regularly patrol and control *Callistemon viminalis* (locate and distinguish from local *Callistemon sieberi* in Spring when flowering). High priority: • Spot weed and/or burshcut herbaceous and grassy weeds, working from areas of best understorey and along the Bunyip Trail and signs first. • Brushcut *Phragmites australis* and *Sigesbeckia orientalis* near to Bunyip Trail and in areas where weed control is required every 2 -3 years. • Record locations of significant flora and regeneration for targeted weeding. Moderate/low priority: • Revegetate areas where native vegetation has not yet been established with species and structural elements missing from the community. • Install nest boxes.
RWZ 2 & RWZ 3	3.3	CBT	Maintain native species cover and diversity. Reduce the weed threat.	Essential: • Regularly patrol for and control high threat herbaceous weeds (including *Bidens pilosa, Cyperaus eragrostis*, and *Xanthium* sp.), exotic and non-local trees (especially Ash) and woody weeds. High: • Brushcut as required for access and weed control.

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
				Low: • Plant shrub species from the target vegetation community.
IRZ 1	NA	CBT	No high threat weed species present.	Essential: • Monitor for and control high threat weeds High: • Remove and replace White Poplars with less invasive trees, preferably from vegetation community 3.3. Low: • Plant tree and large shrub species from 3.3 at sufficiently wide spacings to allow for.

*EC = target vegetation community.

**Resp. = Management responsibility: CBT = CoA biodiversity team, BFL = Bush for Life (Trees for Life) volunteers

4.7 Key Biodiversity Area 7 (KBA 7)

4.7.1 Background

Location	GS Kingston Park / Wirrarninthi (Park 23) “Community Education Hub”
Precinct	West Park Lands Precinct
Other documents	Community Land Management Plan – Annexures 24

4.7.2 Description

Figure 7 shows the KBA boundary and zones within the KBA with other significant features.

Target vegetation communities	3.4 Mallee Box (*Eucalyptus porosa*) Woodland for the dryland areas. The wetlands are a novel vegetation community that do not have a pre-European reference.
Vegetation	This KBA is based around the stormwater wetlands which contain a high diversity of native wetland flora, and adjacent revegetation zones which incorporate older tree plantings with more recent plantings of diverse native understorey. Buffer conservation zones border and connect these areas and contain a high diversity of native species although less ground layer cover. The condition of native vegetation in 2024 for each zone is presented in **Table 11**.
Significant features	The Wirrarninthi Interpretive Trail is located through this KBA, providing both an educational and cultural/artistic interpretation of the site and broader environmental issues. An east-west walking track follows the old road alignment. Stormwater wetlands were constructed in the early 1990s and have been planted with wetland vegetation in the last 10 years. The KBA was officially classed in 2025 following the 2024 biodiversity survey. A native bee hotel is situated between the two wetland zones.
Other Major Uses	• Stormwater management requires desilting of the larger basin in RWZ 2 every 5 years • Kids on Country events use the open grassed areas which are maintained for this purpose.
Volunteers	• A volunteer group meet monthly to work in the site.

4.7.3 Zones

Figure 7 shows the zoning for KBA 7 and significant features. The zones are briefly described in **Table 11** from the native vegetation survey (Miles 2024).

Table 11 *Summary of vegetation communities and condition for each zone (Miles 2024)*

Zone type	Zone ID	Vegetation description	Vegetation condition	Comments
Revegetation Conservation	RCZ 1	Planted beds with a *Eucalyptus* spp. overstorey and complex revegetated stratum surrounded by a managed Couch and Kikuyu grassland	**Good**	Areas of exotic grassland have native grasses and herbs scattered through.
	RCZ 2	Revegetated *Eucalyptus porosa* and *E. microcarpa* woodland with emergent *E. camaldulensis* spp. over revegetated complex stratum	**Excellent**	Includes large old River Red Gums containing hollows as well as nest boxes. Ground layer dominated by chenopods.
Riparian and Wetland	RWZ 1	*Eucalyptus camaldulensis* and *Acacia melanoxylon* over wetland of *Schoenoplectus tabernaemontani, Eleocharis sp.* and herbs	**Good**	High diversity of wetland and fringing flora.
	RWZ 2	*E. camaldulensis* spp. *camaldulensis* and *Casuarina glauca* fringing a *Bolboshoenus* sp., *Phragmites australis* wetland. Creek line dominated by *Typha* sp.	**Moderate**	Low diversity of wetland and fringing flora; Drain Flat-sedge* through shallow wetland. Includes drainage line.
Buffer conservation	BCZ 1	*Eucalyptus microcarpa* and *E. camaldulensis* spp. revegetated woodland	**Good**	Dense overstorey and midstorey, limited ground layer.
	BCZ 2	*Eucalyptus porosa, E. microcarpa* and *E. leucoxylon* over *Aizoon pubescens** and *Enchylaena tomentosa*.	**Good**	Open overstorey and midstorey, native chenopod understorey with dense Coastal Galenia*.

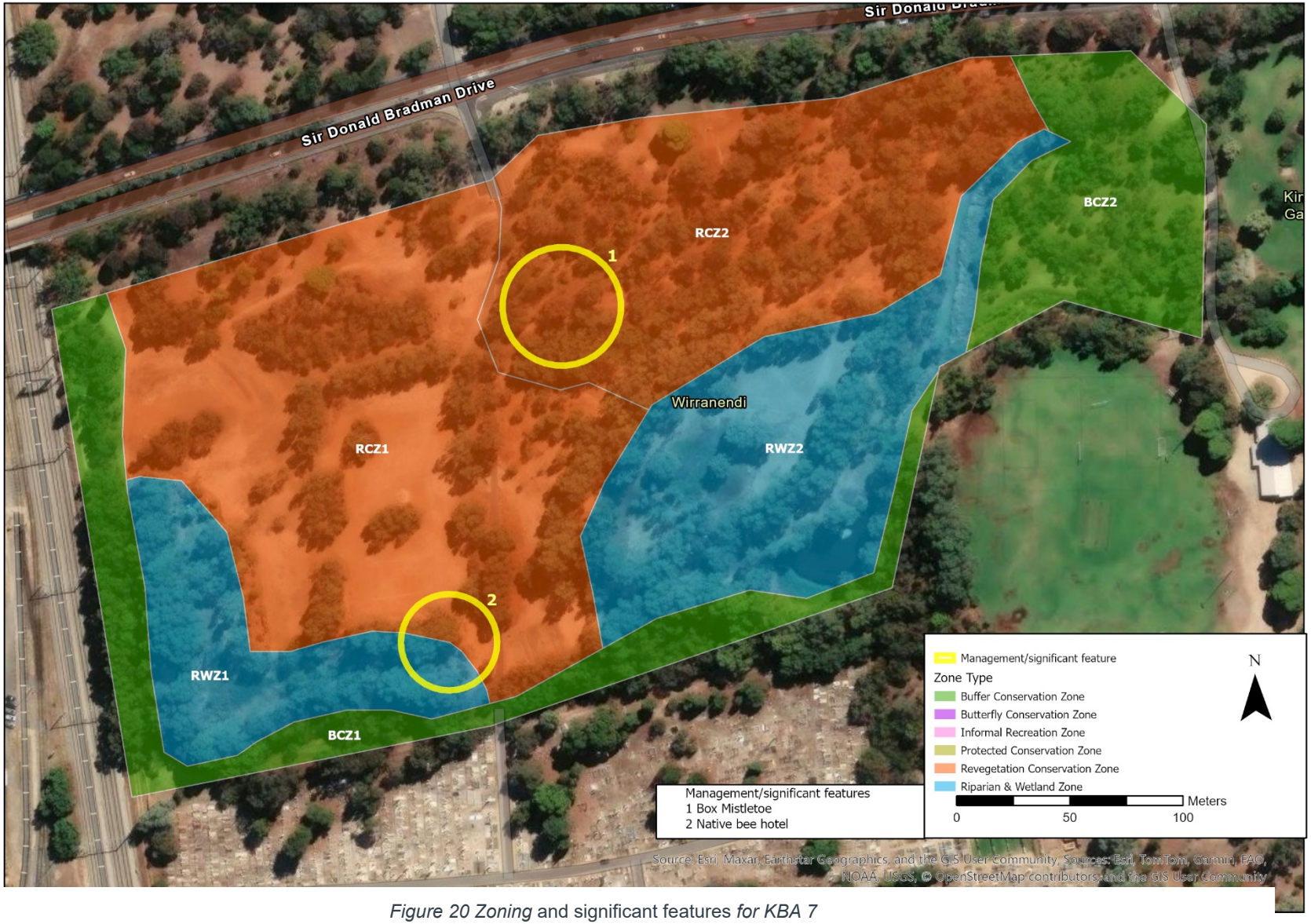

Figure 20 Zoning and significant features *for KBA 7*

Figure 21 *Diversity of species and life forms in RWZ1*

4.7.4 Biodiversity Survey Results

The following is a summary of the KBA 7 biodiversity survey results:

- High diversity of wetland vegetation associations in good condition in RWZ 1 (Taylor et al 2024).
- Low diversity of microbats (Rust 2024) and only Brushtail Possums found in low numbers (McKenzie 2024).
- Highest number of native bees and equal highest diversity (with KBA 1), noting that the site has a high number of low growing flowering trees that are easy to sample; bee hotel being used (Hogendoorn & Leijs 2024).
- 83% of the area was considered to have vegetation in good to excellent condition (CoA 2024).
- 2 plant species of state conservation significance were found, and the only naturally occurring Mistletoe plant in all the KBAs (Miles 2024).

4.7.5 Management Plan

Aims

Two wetlands of high species and habitat diversity, connected and surrounded by high quality revegetated woodlands broadly representative of the Mallee Box woodland community. The adjacent buffer zones extend the habitat for native species and in time will also represent the Mallee Box woodland.

A space for people to enjoy and engage with nature and have a better understanding and develop their appreciation for biodiversity and broader environmental issues.

The KBA provides habitat for a diverse range of native fauna.

Aboriginal Land Management is implemented across the KBA (see Section 2.1).

Objectives

In addition to the objectives set out in Section 4.1, the following objectives apply to KBA 7:

- To establish and maintain diverse native Riparian and Wetland Zones that support water management objectives while providing habitat for aquatic and semi-aquatic species and refugia for terrestrial species.
- To increase the diversity and number of microbats.
- To maintain high native bee diversity and numbers.
- Improve access and amenity to the revegetation area to encourage visitation (CoA 2025).

Vegetation Management

While the KBA is situated within the pre-European vegetation community 3.4 Mallee Box (*Eucalyptus porosa*) Woodland, the soils and hydrology of the site have been heavily modified and therefore it is not recommended that this community be strictly adhered to across KBA 7. It is recommended to use the description for the community to guide decisions for future planting composition in the terrestrial areas, but not to remove vegetation unless it is considered a threat to the ecological values (e.g. *Casuarina* spp. that are not native to the region and can form dense thickets).

The wetlands are a novel ecosystem and the aim for these areas is wetland vegetation communities comprising species native to the Adelaide region that provides a range of habitats for native semi-aquatic fauna and terrestrial fauna. Examples of natural Adelaide Plains wetlands include Aldinga Scrub wetlands and sites around Lewiston.

Similarly, drainage line within RWZ 2 is not “natural” (not shown in Light’s 1939 map but does appear on the 1949 aerial photo) and created from urban stormwater run-off. The target vegetation community is to establish a vegetation community of local native species that is adapted to the water regime and provides habitat for semi-aquatic and terrestrial fauna.

4.7.6 Management Targets and Actions

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
RCZ 1	3.4	CBT	Increase the cover and diversity of native ground layer. Reduce the cover of exotic grasses. Eradicate high threat exotic trees/shrubs.	Essential: • Modify mowing/slashing regime of grassy areas to encourage native grasses to flourish, subject to maintenance required for events. • Continue to plant and maintain diverse native ground layer in planting beds, especially significant herbaceous species including *Pterostylus nutans*. • Control Casuarina (including suckers), Desert Ash, *Acacia saligna* and *A. iteaphylla*. • Do not plant more trees or medium-large shrubs in planting beds. High priority: • Control grassy and herbaceous weeds around native ground layer to facilitate natural regeneration. • Limit future use of mulch to allow for natural regeneration. Low • In the longer term, if the open grassed areas are no longer required, these areas could be targeted for establishing 'missing' species from the target association.
RCZ 2	3.4	CBT	Increase the diversity and cover of native ground layer grassy and herbaceous components. Eradicate high threat exotic trees/shrubs.	Essential: • Control Casuarina (including suckers), *Acacia saligna* and *A. iteaphylla,* Tobacco Tree and Peppercorn tree. • Do not replace trees when they die. • Do not plant more trees or shrubs. High priority: • Monitor regeneration of *Acacia paradoxa* and remove if density of this species increased to 10% or more. • Control growth of grassy and herbaceous weeds throughout, working out from areas of highest native cover. • Monitor Mistletoe, if no new plants appear, undertake hand propagation using Adelaide Plains provenance seed. • Limit future use of mulch to allow for natural regeneration. Low Priority • Remove some large shrubs focussing on species not in the target community, especially *Acacia paradoxa*; aim for 10% cover or less. • Trial establishing new Box Mistletoe (*Amyema miquellii*) collected from nearest populations on River Red Gums and SA Blue Gums.

Zone ID	VC*	Resp. **	5 Year target(s)	Actions
RWZ 1	NA	CBT	Maintain high species diversity and cover and range of habitats. Reduce the weed threat.	Essential: • Maintain current water regime. • Control Desert Ash, *Casuarina sp.*, *Callistemon viminalis, Cyperus eragrostis* and *C. congestus*. Annual patrol for and control re-infestation. For Cyperus sp., if complete removal is unfeasible, at minimum aim to remove seed heads before they ripen to prevent spread. High priority: • In wetland fringe, control False Onion and Scabiosa and carefully control perennial grass weeds and Aster-weed through wetland. • Use grass selective herbicide appropriate for wetland site to manage perennial grass weeds (i.e. Couch)
RWZ 2	NA	CBT	Increase the native species diversity and cover and range of habitats. Reduce the weed threat.	Essential: • Control Desert Ash, Ficus sp., *Casuarina sp.* suckers, non-local *Callistemon sp., Cyperus eragrostis* and *C. congestus* in wetland and *C. involucratus* in creek. Annual patrol for and control re-infestation. For Cyperus sp., if complete removal is unfeasible, at minimum aim to remove seed heads before they ripen to prevent spread. • In conjunction with Assets team, clarify stormwater management requirements and delineate areas where desilting will occur. • Control mature *Casuarina sp.* in stages over the next 5 years, replacing with overstorey species from community 3.3. High priority: • Investigate raising sill to the outlet to increase depth, duration and extent of inundation without negatively impacting flows to RWZ 1. • Monitor for natural recruitment of species from RWZ 1 in the parts of the wetland that won't be de-silted and if this fails to occur after 2-3 years begin active planting. Low Priority • Plant native understorey beneath fringing eucalypts including *Stemodia florulenta* which is present in similar areas in Aldinga.
BCZ 1	3.4	CBT	Increase the cover and diversity of native ground layer species. Reduce the weed threat to adjacent RWZs and RCZs.	Essential: • Control woody weeds and exotic trees (e.g. Olives and Desert Ash). High priority: • Control high threat grassy and herbaceous weeds working along boundaries with PCZs and RCZs. • Use selective mowing/weed control to promote native understorey. • No further mulching. • Monitor *Amyema preissii* and "plant" additional if no natural recruitment occurs.
BCZ 2		CBT		

*EC = target Vegetation community,

**Resp. = Management responsibility: CBT = CoA biodiversity team, BFL = Bush for Life (Trees for Life

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APPENDIX 1: VEGETATION COMMUNITY FLORA LISTS

Table 12 *Species lists for pre-European vegetation communities. Source: Table 4 from Long (2003) with additions from Kraehenbuehl (1996) and authors' knowledge.*

		Vegetation community							
Common name **Difficult to propagate*	**Scientific name**	**3.1 Grey Box / SA Blue Gum Woodland**	**3.2 SA Blue Gum / River Red Gum Woodland**	**3.3 River Red Gum Woodland**				**3.4 Mallee Box Wood-land West**	**3.5 Mallee Box Wood-land, North Adelaide**
				Aquatic	**River Bed**	**River Bank**	**Upper Bank**		
Wreath Wattle	*Acacia acinacea*	✓	✓					✓	✓
Umbrella Bush	*Acacia ligulata*							✓	✓
Blackwood	*Acacia melanoxylon*					✓			
Kangaroo Thorn	*Acacia paradoxa*	✓							✓
Swamp Wattle	*Acacia provincialis*				✓				
Golden Wattle	*Acacia pycnantha*	✓	✓				✓	✓	✓
Wirilda	*Acacia retinodes*				✓	✓			
Willow Wattle	*Acacia salicina*					✓	✓	✓	✓
Elegant Wattle	*Acacia victoriae* ssp. *victoriae*								✓
Sheep's Burr	*Acaena echinata*	✓							
Bidgee-widgee	*Acaena novae-zelandiae*		✓						
Camel Dung *	*Actinobole uliginosum*								✓
Coast Bitter-bush	*Adriana quadripartita*					✓			
Drooping Sheoak	*Allocasuarina verticillata*	✓	✓			✓	✓	✓	✓
Native Wheat-grass	*Anthosachne scabra*	✓	✓			✓	✓		✓
Brush Wire-grass	*Aristida behriana*							✓	✓
Nodding Vanilla-lily	*Arthropodium fimbriatum*	✓	✓					✓	✓
Common Vanilla-lily	*Arthropodium strictum*	✓	✓				✓	✓	✓
Common Woodruff *	*Asperula conferta*							✓	
Marsh Saltbush	*Atriplex paludosa*							✓	✓
Berry Saltbush	*Atriplex semibaccata*							✓	✓
Lagoon Saltbush	*Atriplex suberecta*							✓	✓
Graceful Spear-grass	*Austrostipa acrociliata*								✓
Crested Spear-grass	*Austrostipa blackii*							✓	
Short-crest Spear-grass	*Austrostipa curticoma*							✓	
Cottony Spear-grass	*Austrostipa drummondii*								✓
Feather Spear-grass	*Austrostipa elegantissima*							✓	✓
Rusty Spear-grass	*Austrostipa eremophila*							✓	
Coast Spear-grass	*Austrostipa flavescens*	✓	✓						✓

		Vegetation community							
Common name **Difficult to propagate*	**Scientific name**	**3.1 Grey Box / SA Blue Gum Woodland**	**3.2 SA Blue Gum / River Red Gum Woodland**	**3.3 River Red Gum Woodland**				**3.4 Mallee Box Woodland West**	**3.5 Mallee Box Woodland, North Adelaide**
				Aquatic	**River Bed**	**River Bank**	**Upper Bank**		
Small-seed Spear-grass	*Austrostipa multispiculis*								✓
Balcarra Spear-grass	*Austrostipa nitida*								✓
Tall Spear-grass	*Austrostipa nodosa*		✓				✓	✓	
Flat-awn Spear-grass	*Austrostipa platychaeta*								✓
Rough Spear-grass	*Austrostipa scabra* ssps. *scabra*							✓	
Fibrous Spear-grass	*Austrostipa semibarbata*		✓						
Spear-grass	*Austrostipa* sp.- many sp. likely, poor records	✓							
Tar-vine *	*Boerhavia dominii*						✓		
Salt Club-rush	*Bolboschoenus caldwellii*			✓	✓				
Weak Daisy *	*Brachyscome debilis*		✓						
Angle-fruit Daisy *	*Brachyscome goniocarpa*								✓
Golden Lily	*Bulbine bulbosa*	✓	✓					✓	
Sweet Bursaria	*Bursaria spinosa* ssp. *spinosa*	✓	✓				✓		✓
Blue Grass-lily	*Caesia calliantha*	✓	✓						
Narrow-lip Spider-Orchid *	*Caladenia leptochila*	✓							
King Spider Orchid *	*Caladenia tentaculata*	✓							
River Bottlebrush	*Callistemon sieberi*				✓	✓			
Southern Cypress Pine	*Callitris gracilis*		✓						✓
Pink Garland-lily	*Calostemma purpureum*	✓	✓				✓	✓	
Large Bindweed	*Calystegia sepium*				✓				
Tall Sedge	*Carex appressa*				✓				
Notched Sedge	*Carex bichenoviana*					✓			
Fen Sedge	*Carex gaudichaudiana*					✓			
Mountain Sedge	*Carex gunniana*	✓							
Knob Sedge	*Carex inversa*					✓			
Karkalla (Angular Pig-face)	*Carpobrotus rossii*								✓
Drooping Cassinia	*Cassinia arcuata*								✓
Heart-leaf Centella	*Centella cordifolia*			✓	✓				
Old Man Weed *	*Centipeda cunninghamii*				✓				
Hand Flower *	*Cheiranthera alternifolia*		✓						
Windmill Grass	*Chloris truncata*							✓	

		Vegetation community							
Common name **Difficult to propagate*	**Scientific name**	**3.1 Grey Box / SA Blue Gum Woodland**	**3.2 SA Blue Gum / River Red Gum Woodland**	**3.3 River Red Gum Woodland**				**3.4 Mallee Box Woodland West**	**3.5 Mallee Box Woodland, North Adelaide**
				Aquatic	**River Bed**	**River Bank**	**Upper Bank**		
Common Yellow Button	*Chrysocephalum apiculatum*	✓							
Old Man's Beard	*Clematis microphylla*							✓	✓
	Compositae - many sp. likely, poor records	✓							
Narrow-leaf Bindweed	*Convolvulus angustissimus*	✓						✓	
Dark Midge-orchid *	*Corunastylis rufa*								✓
Common Cotula	*Cotula australis*	✓					✓		
Billy-buttons	*Craspedia variabilis*						✓		✓
Spreading Stonecrop *	*Crassula decumbens* var. *decumbens*		✓						
Tall Scurf-pea	*Cullen australasicum*				✓				
Lemon-grass	*Cymbopogon ambiguus*					✓			
Silky-heads Lemon Grass	*Cymbopogon obtectus*								✓
Australian Hound's-tongue	*Cynoglossum australe*					✓			
Spiny Flat-sedge	*Cyperus gymnocaulos*					✓		✓	✓
Stiff Flat-sedge	*Cyperus vaginatus*				✓	✓			
Black-anther Flax-lily	*Dianella revoluta* var. *revoluta*	✓	✓					✓	✓
Tom Thumb	*Dichondra repens*	✓				✓	✓		
Red Parrot-pea	*Dillwynia hispida*	✓	✓						
Golden Cowslips *	*Diuris behrii*	✓							
Common Donkey-orchid *	*Diurus pardina*	✓							
Sticky Hop-bush	*Dodonaea viscosa* ssp. *spatulata*	✓	✓						✓
Scarlet Sundew *	*Drosera glanduligera*	✓							
Whittaker's Sundew *	*Drosera whittakeri*		✓						
Small Crumbweed	*Dysphania pumilio*						✓	✓	
Yellow Twin-heads	*Eclipta platyglossa*				✓				
Climbing Saltbush	*Einadia nutans* ssp. *nutans*	✓							
Ruby Saltbush	*Enchylaena tomentosa* var. *tomentosa*							✓	✓
Black-head Grass	*Enneapogon nigricans*		✓					✓	✓

		Vegetation community							
Common name **Difficult to propagate*	**Scientific name**	**3.1 Grey Box / SA Blue Gum Woodland**	**3.2 SA Blue Gum / River Red Gum Woodland**	**3.3 River Red Gum Woodland**				**3.4 Mallee Box Wood-land West**	**3.5 Mallee Box Wood-land, North Adelaide**
				Aquatic	**River Bed**	**River Bank**	**Upper Bank**		
Umbrella Grass	*Enteropogon acicularis*							✓	
Hairy Willow-herb	*Epilobium hirtigerum*		✓			✓			
Showy Willow-herb	*Epilobium pallidiflorum*					✓			
Tar Bush	*Eremophila glabra* ssp. *glabra*								✓
River Red Gum	*Eucalyptus camaldulensis* ssp. *camaldulensis*	✓	✓		✓	✓	✓		
White Mallee	*Eucalyptus dumosa*								✓
South Australian Blue Gum	*Eucalyptus leucoxylon* ssp. *leucoxylon*	✓	✓				✓		
Grey Box	*Eucalyptus microcarpa*	✓							
Mallee Box	*Eucalyptus porosa*							✓	✓
Beaked Red Mallee	*Eucalyptus socialis* ssp.								✓
Flat Spurge	*Euphorbia drummondii*							✓	
Native Cherry *	*Exocarpos cupressiformis*		✓						✓
Broom Ballart *	*Exocarpos sparteus*							✓	✓
Cinquefoil Crane's-bill	*Geranium potentilloides* var. *potentilloides*		✓						
Grassland Geranium	*Geranium retrorsum*	✓							
Tall Raspwort	*Gonocarpus elatus*		✓						
Hairy Raspwort	*Gonocarpus mezianus*	✓	✓						
Common Raspwort	*Gonocarpus tetragynus*	✓							
Clasping Goodenia	*Goodenia amplexans*					✓			✓
Hop Goodenia	*Goodenia ovata*								
Spur Goodenia	*Goodenia paradoxa*								✓
Cut-leaf Goodenia	*Goodenia pinnatifida*	✓	✓					✓	✓
Mallee Goodenia	*Goodenia willisiana*								✓
Austral Brooklime	*Gratiola peruviana*			✓		✓			
Lavender Grevillea	*Grevillea lavandulacea* var. *lavandulacea*		✓						
Sweet Hound's Tongue	*Hackelia suaveolens*	✓	✓						✓
Native Lilac	*Hardenbergia violacea*	✓	✓			✓	✓	✓	✓
Satin Everlasting	*Helichrysum leucopsideum*							✓	✓
Erect Guinea-flower	*Hibbertia riparia*		✓						
Silky Guinea-flower	*Hibbertia sericea*		✓						

		Vegetation community							
Common name **Difficult to propagate*	**Scientific name**	**3.1 Grey Box / SA Blue Gum Woodland**	**3.2 SA Blue Gum / River Red Gum Woodland**	**3.3 River Red Gum Woodland**				**3.4 Mallee Box Woodland West**	**3.5 Mallee Box Woodland, North Adelaide**
				Aquatic	**River Bed**	**River Bank**	**Upper Bank**		
Swamp Club-rush	*Isolepis inundata*			✓	✓				
Toad Rush	*Juncus bufonius*				✓			✓	
Grassy Rush	*Juncus caespiticius*				✓				
Sea Rush	*Juncus kraussii*				✓				
Pale Rush	*Juncus pallidus*				✓	✓			
Loose-flower Rush	*Juncus pauciflorus*				✓				
Broom Rush	*Juncus sarophorus*				✓	✓			
Scarlet Runner	*Kennedia prostrata*	✓	✓						
Fairy Grass	*Lachnagrostis filiformis*					✓			
Coast Bottle-daisy	*Lagenophora huegelii*								✓
Leafless Currant-bush*	*Leptomeria aphylla*								✓
Scaly Buttons	*Leptorhynchos squamatus* ssp. *squamatus*		✓						
Beauty Buttons *	*Leptorhynchos tetrachaetus*								✓
Silky Tea-tree	*Leptospermum lanigerum*				✓	✓			
Native Flax	*Linum marginale*		✓						
Native Flax	*Linum marginale*	✓							
Angled Lobelia	*Lobelia anceps*				✓				
Soft Tussock Mat-rush	*Lomandra densiflora*	✓	✓						
Hard Mat-rush	*Lomandra multiflora* ssp. *dura*	✓	✓						
Soft Mat-rush	*Lomandra nana*		✓						
Austral Trefoil	*Lotus australis*							✓	
Australian Gipsywort	*Lycopus australis*				✓				
Harlequin Mistletoe	*Lysiana exocarpi* ssp. *exocarpi*							✓	
Lesser Loosestrife	*Lythrum hyssopifolia*	✓			✓	✓			
Purple Loosestrife	*Lythrum salicaria*				✓				
Short-leaf Bluebush	*Maireana brevifolia*	✓					✓	✓	✓
Wingless Fissure-plant	*Maireana enchylaenoides*	✓	✓					✓	
Coastal Austral Hollyhock	*Malva preissiana*					✓			
Inland Austral Hollyhock	*Malva weinmanniana*					✓		✓	✓
Native Yam	*Microseris walteri*						✓		✓
Sticky Boobialla	*Myoporum petiolatum*	✓	✓						

		Vegetation community							
Common name **Difficult to propagate*	**Scientific name**	**3.1 Grey Box / SA Blue Gum Woodland**	**3.2 SA Blue Gum / River Red Gum Woodland**	**3.3 River Red Gum Woodland**				**3.4 Mallee Box Wood-land West**	**3.5 Mallee Box Wood-land, North Adelaide**
				Aquatic	**River Bed**	**River Bank**	**Upper Bank**		
Mallee Sugarwood	*Myoporum platycarpum* ssp. *perbellum*								✓
Upright Milfoil *	*Myriophyllum crispatum*			✓	✓				
Twiggy Daisy-bush	*Olearia ramulosa*		✓						
Burr stickseed *	*Omphalolappula concava*								✓
Native Sorrel	*Oxalis perennans*	✓						✓	
Hairy Panic	*Panicum effusum* var. *effusum*				✓	✓			✓
Tiny Yellow-star	*Pauridia glabella* var. *glabella*							✓	
Slender Knotweed	*Persicaria decipiens*				✓	✓			
Pale Knotweed	*Persicaria lapathifolia*				✓	✓			
Common Reed	*Phragmites australis*			✓	✓	✓			
Common Riceflower	*Pimelea humilis*		✓						
Native Apricot	*Pittosporum angustifolium*							✓	✓
Thick-stem Poa	*Poa crassicaudex*		✓						
Tussock Poa	*Poa labillardierei* var. *labillardierei*	✓				✓	✓		
Blue Tussock-grass	*Poa poiformis* var. *poiformis*	✓							
Button Podolepis *	*Podolepis aristata* ssp. *affinis*								✓
Curly Pondweed *	*Potamogeton crispus*			✓					
Blunt Pondweed *	*Potamogeton ochreatus*			✓					
Midget Greenhood *	*Pterostylis mutica*								✓
Large Striped Greenhood *	*Pterostylis robusta*								✓
Bristly Greenhood *	*Pterostylis setifera*								✓
Pussy-tails	*Ptilotus spathulatus*							✓	✓
Marshgrass	*Puccinellia stricta*							✓	
Bristly Bush-pea	*Pultenaea acerosa*		✓						
Australian Buttercup	*Ranunculus lappaceus*	✓					✓		
Sea-berry Saltbush	*Rhagodia candolleana* ssp. *candolleana*								✓
Fragrant Saltbush	*Rhagodia parabololica*								✓
Pygmy Sunray *	*Rhodanthe pygmaea*								✓
Hooked Dock	*Rumex brownii*					✓			

		Vegetation community							
Common name **Difficult to propagate*	**Scientific name**	**3.1 Grey Box / SA Blue Gum Woodland**	**3.2 SA Blue Gum / River Red Gum Woodland**	**3.3 River Red Gum Woodland**				**3.4 Mallee Box Woodland West**	**3.5 Mallee Box Woodland, North Adelaide**
				Aquatic	**River Bed**	**River Bank**	**Upper Bank**		
Lobed Wallaby-grass	*Rytidosperma auriculatum*	✓							
Common Wallaby-grass	*Rytidosperma caespitosum*	✓					✓	✓	✓
Short Wallaby-grass	*Rytidosperma carphoides*	✓							
Leafy Wallaby-grass	*Rytidosperma fulvum*							✓	
Slender Wallaby-grass	*Rytidosperma racemosum* var. *racemosum*	✓						✓	
Small-flower Wallaby-grass	*Rytidosperma setaceum*	✓							
Wallaby-grass	*Rytidosperma sp.*		✓						
Tumbleweed	*Salsola australis*								✓
Creeping Samolus	*Samolus repens*				✓	✓			
Quandong	*Santalum acuminatum*							✓	✓
Small-fruit Fanflower	*Scaevola albida*	✓	✓						
Sharp-leaf Club-rush	*Schoenoplectus pungens*			✓	✓				
Shore Club-rush	*Schoenoplectus subulatus (syn. litoralis)*			✓	✓				
River Club-rush	*Schoenoplectus tabernaemontani*			✓	✓				
Horned Bindyi	*Sclerolaena diacantha*					✓	✓		
Slender Groundsel	*Senecio glossanthus*	✓							
Pale Groundsel	*Senecio hypoleucus*				✓				
Variable Groundsel	*Senecio pinnatifolius* var. *pinnatifolius*								✓
Cotton Groundsel	*Senecio quadridentatus*	✓	✓						
Small Wrinklewort *	*Siloxerus multiflorus*		✓						
Creamy Candles	*Stackhousia monogyna*	✓							
Grey Germander	*Teucrium racemosum*							✓	✓
Kangaroo Grass	*Themeda triandra*	✓	✓				✓		✓
Creeping Monkey-flower	*Thyridia repens*				✓				
Mallee Fringe-lily	*Thysanotus baueri*								✓
Yellow Rush-lily	*Tricoryne elatior*		✓						
Common Sunray *	*Triptilodiscus pygmaeus*		✓						
Narrow-leaf Bulrush	*Typha domingensis*			✓	✓				
Ribbon-weed	*Vallisneria australis*			✓	✓				

		Vegetation community							
Common name **Difficult to propagate*	**Scientific name**	**3.1 Grey Box / SA Blue Gum Woodland**	**3.2 SA Blue Gum / River Red Gum Woodland**	**3.3 River Red Gum Woodland**				**3.4 Mallee Box Woodland West**	**3.5 Mallee Box Woodland, North Adelaide**
				Aquatic	**River Bed**	**River Bank**	**Upper Bank**		
Lax Marsh-flower	*Villarsia umbricola var. umbricola*			✓	✓				
New Holland Daisy	*Vittadinia australasica var.*							✓	
New Holland Daisy	*Vittadinia australasica var. australasica*							✓	
Narrow-leaf New Holland Daisy	*Vittadinia blackii*	✓	✓						
Fuzzy New Holland Daisy	*Vittadinia cuneata var.*	✓	✓						✓
Fuzzy New Holland Daisy	*Vittadinia cuneata var. cuneata*		✓						✓
Woolly New Holland Daisy	*Vittadinia gracilis*	✓	✓					✓	
New Holland Daisy	*Vittadinia sp.*		✓						
Tall Bluebell	*Wahlenbergia stricta* ssp. *stricta*	✓							
Yacca	*Xanthorrhoea semiplana* ssp. *semiplana*	✓	✓						

*Indicates species that are difficult to source and/or propagate and/or aquatic species that will be present where conditions are suitable and don't require propagation.

SIGNIFICANT SPECIES LIST

Table 13 *Significant species known to be present in the KBAs, including the zone(s) from which they are known.*

Common Name	Scientific Name	Zone
Fauna		
Rakali	*Hydromys chrysogaster*	**KBA 5:** River and banks
Rainbow Ant	*Iridomyrmex rufoniger*	**KBA 1:** PCZ 1
Chequered Copper (butterfly)	*Lucia limbaria*	**KBA 1:** PCZ 1, BUT 1 **KBA 2:** PCZ 1, PCZ 2, north of BCZ 1 and south of IRZ 1 **KBA 3:** Park 4 & Park 5 **KBA 4:** Adjacent horse paddocks
Grey-headed Flying Fox	*Pteropus poliocephalus*	**KBA 5:** Adjacent Botanic Park
Common Brushtail Possum	*Trichosurus vulpecula*	**KBA 1**: All zones **KBA 2** All zones **KBA3:** Zones unknown **KBA 4:** All zones **KBA 5:** All zones **KBA 7:** All zones
Flora		
Silver Mulga-bush	*Acacia argyrophylla*	**KBA 5:** RCZ 2 **KBA 6:** RCZ 1
Willow Wattle	*Acacia salicina*	**KBA 5:** RCZ 1, RCZ 2, RWZ 1 **KBA 6:** All zones **KBA 7:** RWZ 1, RWZ 2, RCZ 1, RCZ 2
Elegant Wattle	*Acacia victoriae* ssp. *victoriae*	**KBA1:** RWZ 2 & RWZ 3 **KBA 3:** RCZ 2 **KBA 7:** BCZ 1
Box Mistletoe	*Amyema miquelii*	**KBA 7:** RCZ 2
Wire-leaf Mistletoe	*Amyema preissii*	**KBA 7:** BCZ 1
Brush Wire-grass	*Aristida behriana*	**KBA1:** PCZ1 **KBA2:** PCZ1
Nodding Vanilla-lily	*Arthropodium fimbriatum*	**KBA 1:** PCZ 1, PCZ 3 & PCZ 4 **KBA 2:** PCZ 1 to PCZ 3 **KBA 7:** RCZ 1
Common Chocolate-lily	*Arthropodium strictum*	**KBA 1:** PCZ 1, PCZ 2 & PCZ 3 **KBA 2:** PCZ 1 **KBA 4:** PCZ 2 **KBA 7:** RCZ 1
Graceful Spear-grass	*Austrostipa acrociliata*	Not recorded in 2024 survey
Heath Spear-grass	*Austrostipa exilis*	Not recorded in 2024 survey
Small-seed Spear-grass	*Austrostipa multispiculus*	Not recorded in 2024 survey
Flat-awn Spear-grass	*Austrostipa playchaeta*	Not recorded in 2024 survey
Rusty Spear-grass	*Austrostipa eremophila*	**KBA 3:** PCZ 1 **KBA 4:** PCZ 1, BCZ 1
Swollen Spear-grass	*Austrostipa gibbosa*	**KBA 1:** PCZ 1

Common Name	Scientific Name	Zone
		KBA 2: PCZ 1
Balcarra Spear-grass	*Austrostipa nitida*	**KBA 3:** BCZ 2, RCZ 1 **KBA 4**: PCZ 2 **KBA 7:** BCZ 2
Fine-hairy Spear-grass	*Austrostipa puberula*	**KBA 3:** PCZ 1
Marsh Club-rush	*Bolboschoenus medianus*	**KBA 7:** RWZ 1, RWZ 2
Weak Daisy	*Brachyschome debilis*	Not recorded in 2024 survey
Angle-fruit Daisy	*Brachyschome goniocarpa*	Not recorded in 2024 survey
Pink Fairies	*Caladenia latifolia*	**KBA 5:** RCZ 1****
River Bottlebrush	*Callistemon sieberi*	**KBA 6:** RWZ 1 **KBA 7:** RWZ 1, RWZ 2
Garland Lily	*Calostemma purpureum*	**KBA 1:** PCZ 1, PCZ 2, PCZ 4 **KBA 2:** PCZ 3, BCZ 1 **KBA 4:** PCZ 1 & PCZ 2**
Coarse Dodder-laurel	*Cassytha melantha*	Not recorded in 2024 survey
Pink Bindweed	*Convolvulus angustissimus*	**KBA 2:** PCZ 1, PCZ 3
White-stemmed Smooth Correa	*Correa glabra* var. *leucoclada*	Unsure of ssp. recorded in 2024 survey
Lemon-grass	*Cymbopogon ambiguus*	**KBA 1:** RWZ 2 RWZ 3 **KBA 7:** RWZ 1
Australian Hound's-tongue*	*Cynoglossum australe*	**KBA 1:** PCZ 2
Silky Blue-grass	*Dichanthium sericeum* ssp. *sericeum*	**KBA 1:** PCZ 4 **KBA 6:** RCZ 1
Golden Cowslips	*Diuris behrii*	Not recorded in 2024 survey
Curly Windmill Grass	*Enteropogon acicularis*	**KBA 2:** PCZ 1 to PCZ 3, RCZ 1, BCZ 1
Showy Willow-herb	*Epilobium pallidiflorum*	Not recorded in 2024 survey
Beaked Red Mallee	*Eucalyptus socialis ssp.*	**KBA 3:** BCZ 1 & BCZ 2, RCZ2
Large-leaf Eutaxia	*Eutaxia diffusa*	**KBA 1:** PCZ 4
Cutting Grass	*Gahnia trifida*	**KBA 7:** RWZ 1
Variable Glycine	*Glycine tabacina*	**KBA 5:** RCZ 1
White Goodenia	*Goodenia albiflora*	**KBA 7:** RCZ 2
Heath Needlebush	*Hakea mitchellii*	**KBA 5:** RCZ 1
Rough Raspwort	*Haloragis aspera*	Not recorded in 2024 survey
Shield Pennywort	*Hydrocotyle verticillata*	**KBA 6:** RWZ 1 **KBA 7:** RWZ 1
Inland Rush	*Juncus aridicola*	**KBA 6:** RWZ 1
Silky Tea-tree	*Leptospermum lanigerum*	**KBA 6:** RWZ 1 **KBA 7:** RWZ 1
Rock Logania	*Logania saxatilis*	**KBA 7:** RWZ 1, BCZ 2
Soft Mat-rush	*Lomandra nana*	**KBA 1:** PCZ 2
Australian Gipsywort	*Lycopus australis*	**KBA 6:** RWZ 1, IRZ 1
Harlequin Mistletoe	*Lysiana exocarpi ssp. exocarpi*	**KBA 2:** PCZ 1
Wingless Fissure-plant	*Maireana enchylaenoides*	**KBA 1:** IRZ1, PCZ 2, PCZ 4, BCZ 1 **KBA 2:** PCZ 1, PCZ 2, PCZ 3

Common Name	Scientific Name	Zone
		KBA 3: PCZ 1, BCZ 1, RCZ 2 **KBA 4:** All zones
Common Nardoo	*Marsilea drummondii*	**KBA 7:** RWZ 1
Nardoo	*Marsilia mutica*	**KBA 1:** RWZ 1
Short-leaf Honey-myrtle	*Melaleuca brevifolia*	**KBA 1:** RWZ2, RWZ 3 **KBA 6:** RWZ 1
Upright Milfoil	*Myriophyllum crispatum*	**KBA 7:** RWZ1
Coast Tobacco	*Nicotiana maritima*	**KBA 7:** RCZ 2
Wavey Marshwort	*Nymphoides crenata*	**KBA 1:** RWZ 1
Swamp Lily	*Ottelia ovalifolia* ssp. *ovalifolia*	**KBA 1:** RWZ 1
Downy Native Sorrel	*Oxalis radicosa*	Not recorded in 2024 survey
Native Sorrel	*Oxalis perennans*	**KBA 1:** Ubiquitous **KBA 2:** PCZ 1 to PCZ 3, RCZ 1, BCZ1 **KBA 3:** BCZ 1, BCZ 4 & RCZ 2, RCZ 3 **KBA 4:** PCZ 1, BCZ 1 **KBA 5:** RCZ 1 & RCZ 2
Hairy Panic	*Panicum effusum* var. *effusum*	**KBA 7:** RCZ 1
Tiny Yellow-star	*Pauridia glabella var. glabella*	**KBA 1:** PCZ 1, PCZ 3 **KBA 2:** PCZ 1 to PCZ 3
Large Yellow-star	*Pauridia vaginata* var. *vaginata*	**KBA 2:** PCZ 3
Pale Knotweed	*Persicaria lapathifolia*	**KBA 5:** RWZ 1 **KBA 6:** RWZ 1 **KBA 7:** RWZ 1
Variable Plantain	*Plantago varia*	**KBA 1:** PCZ 1
Pleated Copper-wire Daisy	*Podolepis rugata* ssp. *glabrata*	Subspecies recorded in 2024 survey is unknown
Showy Copper-wire Daisy	*Podolepis jaceoides*	**KBA 4:** PCZ 2
Maroon-hood	*Pterostylis pedunculata*	**KBA 1** : PCZ 2
Nodding Greenhood	*Pterostylus nutans*	**KBA 7:** RCZ 1
Pussy-tails	*Ptilotus spathulatus*	**KBA 7:** RCZ 1
Golden Billy-buttons	*Pycnosorus chrysanthus*	**KBA 4:** PCZ 2
Small River Buttercup	*Ranunculus amphitrichus*	**KBA 7:** RWZ 1
Native Raspberry	*Rubus parviflorus*	**KBA1:** BCZ1 (RCZ2) **KBA 6:** RCZ 1
Lobed Wallaby-grass	*Rytidosperma auriculatum*	**KBA 1:** IRZ1, BCZ 1, PCZ 1, PCZ 2 **KBA 2:** BCZ1 **KBA 4:** BCZ 2 RCZ1
Short Wallaby-grass	*Rytidosperma carphoides*	**KBA 1:** BCZ 1, PCZ 4
Leafy Wallaby-grass	*Rytidosperma fulvum*	**KBA 1:** BCZ 1, BUT 1, IRZ, PCZ 2 to PCZ 4 **KBA 5:** RCZ 1
Quandong	*Santalum acuminatum*	Not recorded in 2024 survey
Grey Germander	*Teucrium racemosum*	**KBA 1:** PCZ 4 **KBA 5:** RCZ 1

Common Name	Scientific Name	Zone
Kangaroo Grass	*Themeda triandra*	**KBA 1:** PCZ 1, PCZ 3, PCZ 4, RCZ 2, RCZ3, RCZ 4, CBZ**, BCZ1, **KBA 3:** RCZ 3 **KBA 4:** BCZ 3 **KBA 5:** RCZ 1 **KBA 6:** RWZ 1, RCZ 1
Mallee Fringe-lily	*Thysanotus baueri*	Not recorded in 2024 survey
River Eel-grass	*Vallisneria australis*	**KBA 1:** RWZ 1 **KBA 5:** Karrawirra Parri/River Torrens
Kangaroo Island Speedwell	*Veronica derwentiana* ssp. *anisodonta*	**KBA 1:** RCZ 2
Mount Lofty Speedwell	*Veronica derwentiana* ssp. *homalodonta*	**KBA 5:** RWZ 1***
Narrow-leaf New Holland Daisy	*Vittadinia blackii*	**KBA 1:** PCZ 1, PCZ 4 **KBA 2:** PCZ 1, PCZ 3, RCZ 1 **KBA 3:** PCZ 1
Waisted New Holland Daisy	*Vittadinia cericularis* var. *cervicularis*	**KBA 1:** PCZ1 **KBA 2:** RCZ2
Club-hair New Holland Daisy	*Vittadinia condyloides*	Not recorded in 2024 survey
Dissected New Holland Daisy	*Vittadinia dissecta* var. *hirta*	**KBA 5:** RCZ 1, RCZ 2 **KBA 7:** RWZ 2
Lesser Broad-leaf Star-lily	*Wurmbea latifolia* ssp. *vanessae*	**KBA 1:** PCZ 1**
Golden Everlasting	*Xerochrysum bracteatum*	Not recorded in 2024 survey

* Considered regionally rare however the species can become locally abundant and the sticky seeds are easily spread as well as becoming problematic for maintenance, therefore this species is not a focus for increasing population size.

** Not observed in 2024. Subspecies to be confirmed.

*** Planted in stormwater wetland in 2024 but thought to have died out in summer of 2024-25.

**** Near Hackney Rd Bridge, thought to have regenerated from plantings upstream.

APPENDIX 2: INTERIM HORTICULTURAL MAINTENANCE GUIDELINES

A1.1 Wetland and Riparian Zone

Activity	Wetland and Riparian Zone (WRZ) Management
Definition of Zone (What does it mean?):	
Wetland and Riparian Zone reflects areas of wetland and riparian vegetation and habitat within KBAs, including natural, modified and artificial wetlands and watercourses. Only plantings that use stock of carefully considered provenance and that can contribute positively to the ecological objectives for the KBA are considered as revegetation conservation zones.	
Performance Defects (What do we look for?):	
• Condition of immediate horticultural/ biodiversity assets inclusive of damaged remnant vegetation, site damage, soil damage and evidence of vehicular impacts. • Presence of weed species and requirement for treatment (especially declared species, weeds of national significance and alert weeds). • Presence of weeds that are abundant and/or setting seed. • Presence of introduced animal pests. • Presence of litter and hazardous materials (may include sharps and dangerous items). • Graffiti and vandalism to plants specimens which may or may not present site hazards. • Site hazards (may include damage to related assets such as bollards, signs, lights and organic debris such as tree limbs). • Presence of erosion. • Damage to or degradation of materials and structures intended to prevent erosion.	
Activity Objectives/Definition (What work is included?):	
Note Management aims, and actions are site specific within the KBAs and the management plans for each of the seven KBAs should be followed. Refer to ACC2018/149091 Management Plans KBAs for additional detail. The overall objectives are:	

- To restore vegetation in the most significant remnants so that it resembles the composition and structure of the pre-European vegetation in so far as can be achieved with modified water levels and flow regime.
- To improve connectivity between significant vegetation remnants and promote larger populations of species.
- To protect the quality of water within the zone and downstream.

The horticultural aspects of care and maintenance are:

- Undertaking regular inspection and maintenance of native vegetation sites (in accordance with management or action plans where applicable).
- Marking and protection of sensitive native vegetation areas.
- Collection and propagation of native seed stock.
- Management of weeds using sensitive weed control techniques (brush cutting, hand removal preferred; minimise use of herbicides and additives, and, where required, appropriate herbicides and timing of herbicide around waterbodies spraying,) to prevent off target damage and encourage the regeneration of remnant vegetation.
- Introduced animal pests are controlled where possible.
- No mulching in areas that are at risk of flooding.
- No use of plastic tree guards in areas that are at risk of flooding, and minimise tree guard use as far as practical.
- Inspect zones following high flow and flood events for erosion, rubbish, sediment deposition, plant losses and other damage and respond accordingly.
- Collection of litter, hazardous materials and debris as required.
- Observation and reporting of graffiti and vandalism for removal and remediation as required
- Observation and reporting of site hazards for removal and remediation as required.

Performance Standards (What is required?):

Note

- Sites should be appropriately marked or protected where appropriate and possible.
- No soil damage from vehicular traffic to occur on sites.

 Annual (when required) fire prevention programs to manage fuel load will be undertaken.

Turf/Grass Mowing and Follow Up. Mowing and follow up in general is not undertaken within RWZs however it may be undertaken as required to selectively manage sites mimicking the effects of grazing and/or fire promoting regeneration of desired species and to facilitate thatch management and to provide open areas for passive recreation and enjoyment of the environment.

Mowing is as per the guidelines for Standard 4 – Zone 4 Riparian/Biodiversity Sites (as required and approximately 10 cuts/year), refer to the "Turf/Grass Mowing and Follow Up Procedure Guidelines for additional detail.

Mature Healthy Growth. Native vegetation is not to be damaged by management operations and is to be sympathetically managed in order to promote regeneration e.g. remnant species are permitted to set to seed. Revegetation planting within RWZs will be undertaken in accordance with best practice during the period May-September in any given year due to favourable weather conditions using stock of carefully considered provenance. Refer to the resource: Revegetation During Climate Change in the City of Adelaide ACC2019/143280.

Weed Control; Within RWZs core areas are to be maintained by selective brush cutting, hand removal, appropriate herbicide application and targeted mowing to prevent weeds setting seed where possible.
Note; No broad acre spraying to occur in RWZs.
Control of Pest and Diseases; Integrated pest management techniques used to control pests and diseases if present, introduced animal pests controlled where possible.
Mulch application; none.
Leaf/bark litter and fallen logs to be retained on sites unless determined to be a flood risk.
Litter and collection of hazardous materials; As per Zone 3 and 4 – (Woodland, Riparian/Biodiversity), Litter is to be collected <2 weeks or upon request refer to Litter and Collection of Hazardous Materials Guidelines for additional detail.

Key Performance Indicator

- 95 % compliance to performance standards.

A1.2 Crime Prevention Through Environmental Design

The aim is to provide clear lines of sight along trails and into the surrounding vegetation.

Shrubs are defined as bush-form (i.e. not large grasses, yaccas, tussocks or sedges/rushes) native plants maturing to between 0.5 m 2 m. Larger native shrubs may have their lower foliage removed or thinned to promote visibility. Many native shrubs that mature between 0.5-2m can be pruned to 0.5m or below to achieve this target but will require on-going pruning.

Paths and trails

- No shrubs foliage within 2 m of the edge of a path/trail
- No more than 1 shrub every 10 m within 5 m of a path/trail

New revegetation

It is not anticipated that further broadscale revegetation will take place in the KBAs, however where any revegetation is to take place, the plant selection will need to take into consideration the form of the plants as they grow and their mature form and their placement in relation to existing facilities. In particular, young eucalypt and wattle species can be quite bushy when they are young and these may therefore need to be planted more sparsely within CPTED zones, and/or pruned as they grow.

APPENDIX 3: PARK AMENITY, FACILITIES & LIGHTING IN KEY BIODIVERSITY AREAS

5.1 Purpose

To ensure all park infrastructure supports **biodiversity protection first**, while enabling **low-impact public access**.

Quick Decision Filter

Before installing anything:

- Is it necessary here?
- Can it be placed at the edge instead?
- What species will it impact?
- Can it be lighter, smaller, or removable?

5.2 Core Principles

1. Core Principle: Ecology First

Apply the mitigation hierarchy:

- **Avoid** impacts (no infrastructure in core habitat)
- **Minimise** footprint and disturbance
- **Mitigate** unavoidable impacts

Some areas should remain **amenity-free and unlit**

2. Spatial Zoning Framework

- All KBAs are zoned:
  - Core Conservation Zones PCZ, RCZ, RWZ, BUT.
    - No access, no infrastructure, no lighting
  - Buffer Zones BCZ
    - Minimal access (trails only), no amenities
  - Recreation Edges IRZ
    - All amenities and facilities concentrated here
- **Rule:** Push infrastructure to edges, not into habitat

3. Amenities & Facilities

Placement

- Locate along existing disturbed areas (paths, edges)
- Maintain buffers:
  - 30–50 m from waterways/wetlands
  - 50–100 m from key habitat (species dependent)

Design & Materials

- Use low-toxicity, durable materials

- Prefer modular, lightweight, reversible construction
- Minimise ground disturbance (e.g. screw piles, raised decks)

Seating & Structures

- Provide fewer, clustered nodes (not dispersed)
- Avoid shelters in sensitive areas (encourages prolonged stay)
- Use simple, unobtrusive forms

Waste

- No bins in habitat zones
- Use “carry in, carry out” approach where possible
- If required: wildlife-proof bins at entry points only

4. Lighting (Critical Control)

Default Position

- No lighting in KBAs, especially:
    - Riparian zones
    - Wetlands
    - Woodland patches

Where Required (Safety Only)

- Limit to:
    - Entry points
    - Key paths at edges

Lighting Design Standards

Aligned with International Dark-Sky Association principles

- Warm light: ≤3000K (prefer 2200K)
- Fully shielded (no upward spill)
- Low poles (≤3–4 m)
- Directional only
- Motion sensors / curfews (e.g. lights off after 10–11pm)
- Do not light:
    - Water bodies
    - Tree canopies
    - Habitat interiors

5. Access & Movement

- Keep paths narrow, clear, and well-defined
- Use boardwalks in sensitive areas
- Prevent and close off unneeded informal trails via:
    - Planting
    - Logs / rocks (soft barriers)
    - Signage

6. Habitat Protection by Design

- Infrastructure should protect habitat, not invite intrusion
- Use subtle exclusion:
    - Vegetation buffers
    - Natural edge treatments
    - Low fencing where necessary

7. Activity & Disturbance

- Avoid in or near KBAs:
    - Playgrounds
    - Events
    - High-intensity recreation
- If unavoidable:
    - Maximise distance
    - Buffer with vegetation

8. Adaptive Management

- Monitor:
    - Species presence (birds, mammals, invertebrates)
    - Visitor movement
- Be prepared to:
    - Remove or relocate infrastructure
    - Reduce lighting
    - Seasonally close areas