



Wadmore Park/Pulyonna Wirra Management Plan 2021-2026



CAMPBELLTOWN
CITY COUNCIL

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VERSIONS

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ABBREVIATIONS

Table 1- Abbreviations used throughout this Plan

Abbreviation	Meaning
BHCP	Black Hill Conservation Park
Council	Campbelltown City Council
CP	Conservation Park
EPBC	Environment Protection and Biodiversity Conservation Act
Landcare Group	The Campbelltown Council Landcare Group
MLR	Mount Lofty Ranges
NPWA	National Parks and Wildlife Act 1972
NGT	The Nature Glenelg Trust
SA	South Australia
The Park	Wadmore Park/Pulyonna Wirra (this translates to Black Hill in English)
The Plan	Refers to this plan, the

SUMMARY

Wadmore Park/Pulynnonna Wirra (the Park) is much loved by the local community and other visitors and serves a range of purposes such as Landcare, bushwalking, recreation, birdwatching, connectivity to conservation areas and walking trails, as well as providing an opportunity for connecting to nature and improving wellbeing. The Park is owned by Campbelltown City Council (the Council) and jointly managed with the Campbelltown Landcare Group (the Landcare group) who implement strategic on-ground works.

The Park is arguably one of the most ecologically significant within the Greater Adelaide region because of its size, remnant vegetation communities, threatened species, plant and animal species richness and its connection to other natural settings.

The Council is seeking new management recommendations that are strategic, effective and serve multiple outcomes. The intention of this Management Plan (the Plan) is to guide best-management practices in context of the environmental, social, historical and cultural values of the Park within a changing climate. The management recommendations proposed are intended to be realistic and implementable and balance out the biodiversity and environmental values of the Park with bushfire risk and safety. This Plan acknowledges that there are opportunities to learn by doing and as such, novel approaches are to be trialled and monitored and then adapted accordingly.

This Plan provides a range of recommendations based on the strategic analyses of the park values and threats and identifying what outcomes are possible with the right type of management and resourcing. Examples of the recommendations include trialling small scale and well-planned ecological and cultural burns, reducing fire risk to residents and park-users, managing weed risks, protecting the biodiversity assets and visitor safety via appropriate park use, adapting to climate change and maintaining strong partnerships and collaborations.

This Plan is underpinned by a suite of objectives and twenty-nine core management recommendations that support these objectives. The objectives are:

- Trial ecological and cultural burns for biodiversity outcomes
- Improve the vegetation state in the Park by removing undesirable species and other risks
- Control and mitigate against adverse visitor effects and support low impact visitation
- Address and implement climate change resilience management and restoration approaches
- Identify and address existing, potential and/or perceived fire risk to habitat, flora, fauna, residents and visitors. This means debunking and education about perceived fire risks.
- Maintain and improve infrastructures that protect park assets and ensures safety of visitors
- Conserve the cultural and historical values of the Park
- Monitor and communicate trends, challenges and concerns between stakeholders and adapt management accordingly.

One of the challenges with park management is having adequate resources to fully implement the key actions while also having capacity to be responsive to emerging issues. Although this Plan does not provide an implementation or works schedule, it provides prioritisation, risk assessment and monitoring and evaluation guidance to assist Council and the Landcare Group to develop mutually agreed action plans.

Document outline

Information within this document is summarised below:

Section 1 provides the strategic context for developing this management plan and the legislation and policy that the management recommendations must comply with.

Section 2 provides information on the park setting, its location, its historical and cultural significance.

Section 3 outlines the key values and functions of the Park.

Section 4 summarises how the Plan was developed and how it will guide decision making and implementation.

Section 5 describes the high-level and overarching strategic elements of the Plan in context of the goals, objectives, desirable outcomes and a set of principles that underpins the Plan is also provided.

Section 6 details the specific management recommendations that will achieve delivery of each management objective. Also, within this section is an options analysis that considers the recommendations in context of different scenarios.

Section 7 assists with Council and stakeholder decision making by undertaking a risk assessment, providing a prioritisation matrix and presenting a framework for monitoring and evaluation.

1. STRATEGIC CONTEXT

1.1 Legislation and policy setting

Management of the Wadmore Park/Pulyonna Wirra (the Park) needs to comply with legislation at the state and national level and policy documents. The recommendations within this Plan have been developed in context of the following legislative framework:

- *Fire and Emergency Services Act 2005*
- *Native Vegetation Act 1991*
- *Landscape SA Act 2019* (replacing *Natural Resources Management Act 2004*)
- *Planning, Development and Infrastructure Act 2016*
- *Healthy Parks Healthy People Plan 2021-2026*

South Australians planning reform has resulted in the Planning and Design Code replacing all planning policy across the South Australia and this tool will ensure the implementation of the *Planning, Development and Infrastructure Act 2016*. The Planning and Design Code will specify the rules and policies for the development of the Park.

As the Park contains threatened species protected under the Australian Governments Environment Protection Biodiversity Conservation (EPBC) Act 1999, there are also requirements under this legislation.

The policy framework for management includes:

- Campbelltown City Council Emergency Management Policy
- Campbelltown City Council Strategic Plan 2024
- Campbelltown City Council Environment Plan 2024
- Campbelltown City Council Risk Management Policy
- Campbelltown City Council Communications Management Plan 2017-2022
- Campbelltown City Council Open Space Strategy 2012

Under Councils development plan, the Park is located within the residential zone. It is also acknowledged that South Australia's planning reform might have additional policy obligations. The new planning system will be operational within urban council regions in 2021. The Park is classified as community land under Council's Community Land Management Plans.

Figure 1 provides a conceptual outline of the strategic context for this Management Plan.

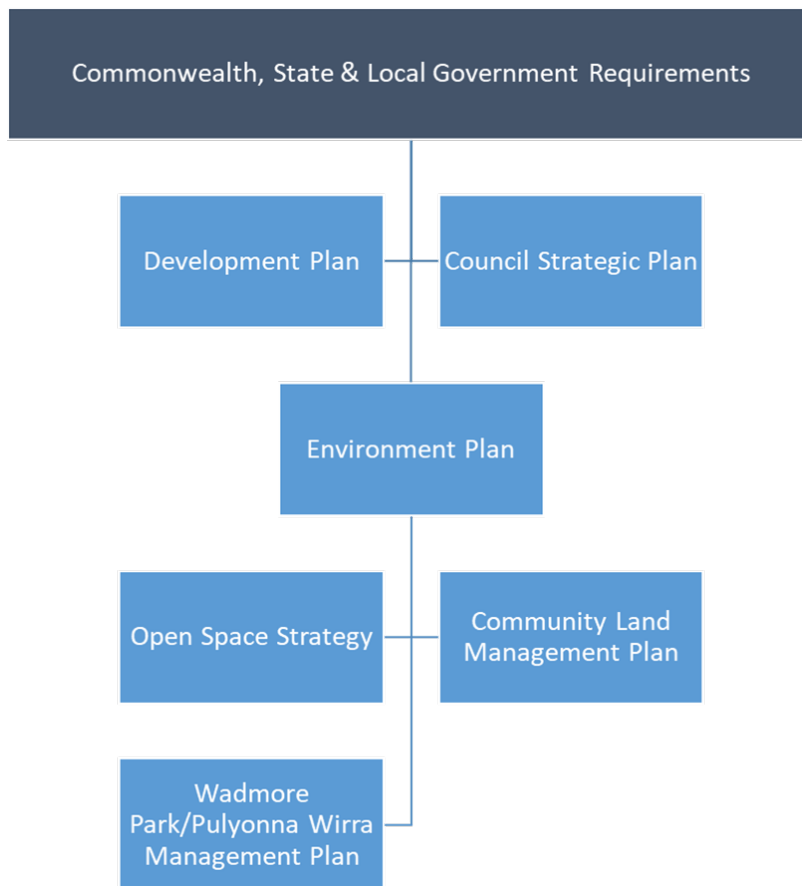


Figure 1: Conceptual strategic context for the Management Plan

1.2 Park context

Management of the Park directly complements the key theme of Liveable Campbelltown, specifically *Protect and enhance natural areas, creeks, flora and fauna, biodiversity and open space*. There are additional complementarities with other themes such as mental health, connectivity and physical activity.

There are several plans and reports that have been specifically produced for the Park. These include:

- Wadmore Park Vegetation Management Action Plan 2005
- Wadmore Park/Pulyonna Wirra Management Plan 2013-2018
- Wadmore Park Vegetation Integrity Report 2015
- Biodiversity Condition Mapping Report 2018
- Wadmore Park/Pulyonna Wirra Bird Project Report 2019
- Campbelltown Landcare Group (CLG) Wadmore Park Proposed Track Rehabilitation and Closures 2016

Other reports in preparation include:

- Wadmore Park/Pulyonna Wirra Fauna Survey 2020
- Wadmore Park/Pulyonna Wirra Biodiversity Condition Assessment 2020

1.2 Rationale for this Management Plan

The Council and Landcare Group have been well-guided by the Vegetation Management Action Plan 2005 and the Management Plan 2015-2020 with demonstrable on-ground wins. There has been significant investment (Council budget, State and Federal Government Grants and Landcare Group volunteer resources and grants) in improving and conserving the Park and the resulting environmental outcomes are recognised.

An updated plan is needed that considers the concerns and viewpoints of stakeholders and users of the Park in the context of the biodiversity, fire management, visitor use and impacts and climate change. This Plan also synthesises and amalgamates previous datasets.

The Plan was designed using an outcome focussed approach and provides a series of management recommendations that will work towards, or achieve, these outcomes. The Plan is not an action or implementation plan and it is suggested that these are co-developed between Council and the Landcare Group and reviewed accordingly. The implementation plan should be no more than 3 years to allow for an adaptive approach that is responsive to emerging priorities and issues. The content could include information on resourcing requirements, actions and outputs, scheduling, key deliverables and responsibilities. It is also recommended that funding for delivering the work described within the implementation plan is considered and secured for that period.

2. ABOUT THE PARK: A UNIQUE BIODIVERSITY RESERVE WITHIN A PERI-URBAN SETTING

2.1 Background

The Park supports one of the few remaining ecologically significant vegetation remnants within Adelaide's semi-urban area. It serves a range of purposes such as bushwalking, recreation, native flora and fauna habitat, landscape connections and providing local residents and visitors with an opportunity to immerse themselves in nature. It is a public park and managed by Council and the Landcare Group.

It is located within Athelstone and is surrounded by residences and Black Hill Conservation Park (hereafter referred to as Black Hill CP) - Figure 2. The entire area is approximately 30 hectares and the majority of this supports significant biodiversity and nature conservation assets.

Prior to 2008, the Park was called Wadmore Park in honour of Edwards Royal Wadmore who served Council for 21 years. On advice from Kurna Warra Karrpanthi, the name was changed to Wadmore Park Pulyonna Wirra in 2008 (*Pulyonna Wirra* meaning Black Hill) to acknowledge and respect that the Park exists on Kurna land. To further recognise that the Park is on the traditional lands of the Kurna people, Kurna Elder Ivan-Tiwu Copley installed signs with Aboriginal artwork within the Park (IT Copley 2020, pers.comm.).

The Park has historical significance as it was used as a military training site during World War II and later became the location for a military hospital from 1942-1946 (Campbelltown City Council website). During this time staff and patients were active in creating garden areas including 45 Chinese Elm trees along the main Addison Road entrance. The Park was leased by the Athelstone-Torrens Valley Rifle Range for several years dating back to 1912 - [click here](#). These trees are no longer present, but the history is recognised with the Avenue of Honour that has local sourced Blue Gums planted along the original hospital access road (Campbelltown City Council website). Other remnants of this time are still evident in the Park such as the rockery remains.

The Campbelltown Landcare Group are a key stakeholder and have worked with Council since 1994 to implement critical restoration work for biodiversity outcomes. The condition of the Park is much improved on account of this work and the Landcare Group continue to undertake best-practice and minimal impact weed control and revegetation. The Council and Landcare group also provide educational material and strive to improve knowledge by seeking funds for monitoring, data acquisition and workshops. The local community and nearby residents are also a major and active stakeholder with strong links to the Park. Other stakeholders include rate payers and residents, community and association groups, Campbelltown Historical Society, fitness and recreation groups, local schools, residents, non-residential visitors, Department for Environment and Heritage, Councils Reconciliation Committee and fire management authorities.

The Park supports a range of ecosystem types including terrestrial, riparian and tributaries from Black Hill CP. The tributaries from Black Hill CP flow through the Park and feed into Fifth Creek which drains into the River Torrens.

The 2016 Census estimated the population within the Council area as 52,252 compared to 48,600 in 2010 (Golder Associates 2010) which is a 7.5% increase within 5 years. Ongoing developments surrounding the Park and a rapidly increasing population will mean that visitor pressure and demand for open space will continue to increase.

The surrounding area previously supported woodland communities and was cleared for housing in the 1960's (Cochrane 2016). The existing vegetation communities within the Park were classified for the 2020 survey and varied in area from 1.58 hectares (ha) for the riparian woodland, 1.77 ha for the open heathland, 6.1 ha for the grassy woodland, and 15.5 ha for the shrubby woodland. The vegetation communities were identified as:

- *Eucalyptus camaldulensis* ssp. *camaldulensis* woodland over low *Allocasuarina verticillata* woodland, tall open *Acacia pycnantha* shrubland with low dense **Ehrharta longiflora* +/- **Bromus diandrus* grassland (riparian woodland).
- *Eucalyptus leucoxylon* +/- *E. camaldulensis* woodland over tall very open *Acacia pycnantha* shrubland and dense **Pentameris pallida* +/- *Avena* sp. +/- *Austrostipa* spp. +/- *Bothriochloa macra* grassland (grassy woodland).
- *Eucalyptus fasciculosa* +/- *E. leucoxylon* +/- *E. camaldulensis* woodland over a tall *Acacia paradoxa* shrubland with low open *Hibbertia sericea* shrubland and low **Pentameris pallida* +/- **Ehrharta longiflora* grassland (shrubby woodland).
- Very open *Allocasuarina verticillata* woodland with low open *Calytrix tetragona* +/- *Hibbertia sericea* shrubland (open heathland).

As the Park is nested within an urban setting, its biodiversity and nature conservation values are significant. The Park is arguably one of the most important conservation parks within urban Adelaide because of its size, remnant vegetation communities, threatened species, plant and animal species richness and its connection to other natural settings. The Park has patches of heathland and grassland that support habitat specialist species. These vegetation assemblages are further important because very little of it remains within Greater Adelaide and the Mount Lofty Ranges (MLR).



Figure 2: Location of Wadmore Park/Pulyonna Wirra. Source: Google Earth

3. VALUES AND THREATS

The Park represents a diversity of values and functions, which are described within this section. There is recognition that management should balance the preservation of biodiversity with the public enjoyment of the Park. Although it is widely recognised that the Park has a range of values, it is also acknowledged that these should not necessarily have equal weighting. As an example, the unique ecological integrity of the Park might mean that management priorities are skewed towards preserving the biodiversity and nature-based values. When reviewing the values of the Park and evidence of current visitor impacts, it was clear that some types of visitation and use of the Park are not always compatible with the high value biodiversity and the nature-based integrity of the Park.

The Park is directly surrounded by residences and Black Hill Conservation Park (BHCP) and as such is vulnerable to bushfires (directly or via ember attacks) as well as potentially being a bushfire risk (to residents and BHCP) if not managed accordingly.

3.1 Biodiversity and nature connections

All stakeholders engaged concurred that the biodiversity and nature conservation and proximity to other nature walking trails within the Park was one of its most important values. The Park serves a critical landscape connectivity function as it joins up with BHCP and includes sections of the Fifth Creek walking trail. This provides opportunities for residents and park-users to immerse themselves in nature at a larger and more connected scale, as well as providing refuge habitat for fauna species. The Park is habitat for a range of fauna species and provides visitors with an opportunity to see wildlife such as kangaroos and koalas and a high diversity of birds.

The diversity of plant species within the Park is significant as 266 species have been recorded when amalgamating all available datasets (Brewer 2005, NatureMaps, Duffield and Jeffery 2020 and Prescott 2020). Of these recorded plant species, 52 have been identified as either locally important (restricted range within Council area) or having a threatened conservation status. See Appendix 2 for full list of plant species

When combining Nature Maps data with other datasets (Fahey-Sparks 2019 and Nature Glenelg Trust 2020), a total of 132 different animal species have been recorded (Table 2). There are potentially other species that also use the Park and when applying a 2km buffer an additional 46 species were added to the species list. See Appendix 3 for full list of plant species

Table 2: Fauna species recorded in the Park

Fauna group	Number	Percentage of native species
Amphibians	2	100%
Birds	89	91%
Invertebrates	30	Unknown
Mammals	6	83%
Reptiles	5	100%

3.2 Species of conservation significance

Approximately 26% of recorded plant species are recognised as threatened regionally, within the state or under the Australian Governments EPBC Act. The Park is habitat for two nationally listed orchid species *Prasophyllum pallidum*, Pale Leek-orchid and *Prasophyllum pruinosum*, Plum Leek-orchid. In 2009, *P.pruinosum* was only found in 8 locations and it is likely this distribution has decreased in the last 11 years (Landscapes SA website – [click here](#)). The threats to both species include weed invasion, recreational impact (such as trampling), lack of formal protection and habitat senescence. A list of all plant species with a conservation rating is provided as Table 3.

Table 3: Plants of conservation significance

PLANT SPECIES	COMMON NAME	THREATENED STATUS			
		EPBC ¹	NPW ¹	AMLR ²	Threatened on park level ³
<i>Acacia acinacea</i>	Wreath Wattle			RA	
<i>Acacia continua</i>	Thorn Wattle			RA	□
<i>Acacia cupularis</i>	Cup Wattle			RA	□
<i>Acaena novae-zelandiae</i>	Biddy-biddy				□
<i>Acrotriche serrulata</i>	Cushion Ground-berry				□
<i>Anthosachne scabra</i>	Native Wheat-grass				□
<i>Aphelia pumilio</i>	Dwarf Aphelia			NT	
<i>Arthropodium fimbriatum</i>	Nodding Vanilla-lily			NT	
<i>Austrostipa elegantissima</i>	Feather Spear-grass				□
<i>Austrostipa setacea</i>	Corkscrew Spear-grass			VU	□
<i>Austrostipa tenuifolia</i>	Narrow-leaf Spear-grass		R	RA	
<i>Baumea juncea</i>	Bare Twig-rush				□
<i>Bothriochloa macra</i>	Red-leg Grass		R	RA	
<i>Bulbine bulbosa</i>	Bulbine-lily			NT	
<i>Bulbine semibarbata</i>	Small Bulbine-lily			VU	
<i>Caladenia reticulata</i>	Veined Spider-orchid			VU	□
<i>Caladenia tentaculata</i>	King Spider-orchid			NT	
<i>Callistemon sieberi</i>	River Bottlebrush			VU	□
<i>Carex tereticaulis</i>	Rush Sedge				□
<i>Cheilanthes sieberi</i> ssp. <i>sieberi</i>	Narrow Rock-fern			RA	□
<i>Cheiranthra alternifolia</i>	Hand-flower			NT	
<i>Clematis microphylla</i>	Old Man's Beard				□
<i>Comesperma calymega</i>	Blue-spike Milkwort				□
<i>Cullen australasicum</i>	Tal Scurf-pea			RA	
<i>Cymbopogon oblectus</i>	Silky-head Lemon-grass			RA	□
<i>Cynoglossum suaveolens</i>	Sweet Hounds-tongue			NT	□
<i>Daviesia brevifolia</i>	Leafless Bitter-pea				□
<i>Daviesia ulicifolia</i> ssp. <i>incarnata</i>	Gorse Bitter-pea				□
<i>Digitaria brownii</i>	Cotton Panic-grass			VU	□
<i>Diuris pardina</i>	Spotted Donkey-orchid			NT	
<i>Epilobium hirtigerum</i>	Hairy Willow-herb				□
<i>Eriochilus cucullatus</i>	Parsons Bands				□
<i>Eucalyptus fasciculosa</i>	Pink Gum			NT	
<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	Blue Gum			NT	
<i>Genoplesium rufum</i>	Red Midge-orchid				□
<i>Gompholobium ecostatum</i>	Dwarf Wedge-pea			NT	□
<i>Goodenia amplexans</i>	Clasping Goodenia			NT	
<i>Hakea rugosa</i>	Dwarf Hakea			NT	
<i>Hardenbergia violacea</i>	Native Lilac			NT	
<i>Hibbertia crinite/sericea</i>	Silky Guinea-flower			NT	

<i>Juncus pauciflorus</i>	Loose-flower Rush			NT	□
<i>Lepidosperma curtisae</i>	Little Sword-sedge			NT	
<i>Leucopogon concurvus</i>	Scrambling Beard-heath			NT	
<i>Lobelia gibbose</i>	Tall Lobelia			NT	
<i>Lomandra sororia</i>	Sword Mat-rush			NT	
<i>Maireana enchylaenoides</i>	Wingless Fissure-plant				□
<i>Opercularia turpis</i>	Twiggy Stinkweed			NT	□
<i>Orthoceras strictum</i>	Horned Orchid			RA	□
<i>Panicum effusum</i> var <i>effusum</i>	Hairy Panic			NT	□
<i>Pelargonium littorale</i>	Native Pelargonium			NT	□
<i>Plantago gaudichaudii</i>					
	Narrow-leaf Plantain			NT	
<i>Plantago</i> sp. B (R.Bates 44765)	Little Plantain			RA	
PLANT SPECIES	COMMON NAME	THREATENED STATUS			
		EPBC ¹	NPW ¹	AMLR ²	Threatened on park level ³
<i>Poa clelandii</i>	Matted Tussock-grass				□
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	VU	R	EN	□
<i>Prasophyllum pruinosum</i>	Plum Leek-orchid	EN	V	EN	
<i>Prostanthera behriana</i>	Downy Mintbush			RA	□
<i>Pterostylis sanguinea</i>	Blood Greenhood			NT	
<i>Ptilotus erubescens</i>	Hairy-tails		R	RA	□
<i>Quinetia urvillei</i>	Quinetia			NT	
<i>Rytidosperma fulvum</i>	Leafy Wallaby-grass			VU	
<i>Rytidosperma pilosum</i> ssp. <i>pilosum</i>	Hairy Wallaby-grass			NT	
<i>Santalum acuminatum</i>	Quandong			RA	□
<i>Senecio hypoleucus</i>	Pale Groundsel			RA	□
<i>Spyridium parvifolium</i>	Dusty Miller			NT	□
<i>Spyridium vexilliferum</i>	Winged Spyridium			RA	
<i>Stylidium calcaratum</i>	Spurred Trigger-plant			NT	
<i>Stylidium despectum</i>	Hundreds and Thousands			NT	
<i>Thelymitra luteocilium</i>	Yellow-tuft Sun-orchid			NT	
<i>Thelymitra nuda</i>	Scented Sun-orchid			RA	
<i>Trachymene cyanopetala</i>	Purple Trachymene			RA	
<i>Trachymene pilosa</i>	Dwarf Trachymene			NT	
<i>Tricoryne elatior</i>	Yellow Rush-lily			NT	
<i>Velleia paradoxa</i>	Spur Velleia			RA	
<i>Vittadinia blackii</i>	Narrow-leaf New Holland Daisy			RA	□
<i>Walwahalleya proluta</i>	Rigid Panic			VU	□
<i>Xanthorrhoea quadrangulata</i>	Rock Grass-tree			RA	
<i>Xanthorrhoea semiplana</i> ssp. <i>semiplana</i>	Yacca				□

¹ data from NatureMaps ² Gillam and Urban (2014) ³ Brewer 2005. Abbreviations: EN=endangered;V+VU=vulnerable;R+RA=rare;NT=near threatened

There are additional flora observations that have been provided by Sproule (2020). These species are considered threatened at the park level and include *Prasophyllum odoratum*, *Caladenia carnea*, *Caladenia prolata* and *Corybas diemencius*.

There are 30 fauna species of conservation significance within or close to the Park. The Grey-headed Flying-fox was recorded during the Nature Glenelg Trust (NGT)/Landcare Fauna Survey April 2020 and has a vulnerable status under National Park Wildlife Act 1972 (NPWA). The Park is important for providing refuge for this species during extreme heat events. Bibrons Toadlet, recognised as rare, was also recorded during the NGT/Landcare Survey. It is associated with areas alongside ephemeral

creeks and damp depressions where there is adequate litter and debris (DEW 2008). Mountain Galaxias are considered vulnerable within the MLR and although not recorded within the Park, they have been recorded 700m upstream and management should include actions that would provide habitat and conditions for this species. Threats for this species include habitat degradation and loss of stream side vegetation.

Table 4 provides a summary of regionally threatened bird species recorded in the Park or within 2km of the Park (nine of these are listed under NPWA). Information about the habitat requirements and documented threats are also provided in the table (DEW 2008).

Table 4: Threatened fauna, habitat requirements and threats

Species	Regional status	Habitat requirements in MLR	Threats
Brush Bronzewing	U	Dense shrub layer such as low grassy heathland or dense shrub and heath	Habitat loss, predation (such as foxes and cats), increasing temperatures
Chestnut-rumped Heathwren ¹	V	Heath and dense undergrowth particularly Heathy woodland and shrublands	Wildfire, dieback (from PC), weed invasion and habitat loss
Diamond Firetail ¹	V	Grassy understoreys and Grassy woodlands (particularly Allocasuarina verticillate)	Vegetation clearance and fragmentations, invasion of exotic grasses, prescribed burning (if weeds dominate regeneration)
Fan-tailed Cuckoo	V	Heathy Forest or woodland	Habitat loss and degradation
Red-rumped Parrot ²	V	Open grasslands, Grassy woodlands and Riparian	Lack of nesting hollows, predation (cats and foxes), habitat loss
Restless Flycatcher ²	E	Grassy Woodland and Heathy Woodlands	Removal/clearance of loose timber, habitat loss
Rufous Whistler ²	U	Grassy Woodland and Heathy Woodlands	Habitat loss and fragmentation; wildfire, frequent control burns, weed invasion (prefers open areas)
Sacred Kingfisher ¹	U	Grassy Woodland, Heathy Woodland and Riparian	Habitat loss
Scarlet Robin	V	Grassy Woodland, Heathy Woodland and Heathy Forest	Frequent control burns, or long unburnt regimes (frequently seen in recently burnt areas), habitat degradation, reduced leaf litter and increased grass cover
Tawny-crowned Honeyeater	U	Shrubland	Habitat loss and degradation, invasion of woody weeds
Tawny Frogmouth ²	U	Heathy Woodland and Grassy Woodland	Car strikes and habitat loss
Tree Martin ²	U	Heathy Woodland and Grassy Woodland	Reduced tree hollows, habitat loss and degradation
White-browed Babbler	U	Heathy Woodland and Grassy Woodland	Loss of vegetation cover and food sources

White-naped Honeyeater	U	Heathy and Grassy Woodland	Habitat loss and degradation, invasion woody weeds, interspecific competition and competition for food (e.g. with Koalas damaging Eucalypt species)
Yellow-rumped Thornbill	U	Grassy Woodland and Grasslands	Habitat loss, weed invasion
Yellow-tailed Black-Cockatoo ²	V	Grassy Woodland, Heathy Woodland and Heathy Forest	Loss or competition for nesting hollows, wildfire and prescribed burning if food plants destroyed
Zebra Finch	U	Grassy Woodland, Shrubland and Wetlands	Habitat loss and degradation

¹ Records within 2km radius of the Park ² Recorded recently by Fahey-Sparks 2019 ³. Abbreviations: EN=endangered; V+VU=vulnerable; R+RA=rare; NT=near threatened

3.3 Connection to and protection of nature

The Park provides a place for community, residents, interest groups and other visitors to connect with nature and reap the benefits of being outdoors. Within urban environments, the opportunity to walk, run, explore or observe nature can result in improved health and wellbeing and embed a sense of pride in local place. Although BHCP is also present within Council area, Wadmore/Pulyonna Wirra provides an option for people who do not feel physically or psychologically safe walking in areas that are more challenging, away from main roads and with less visitation.

A section of the new Adelaide 100 Walking Trail occurs within the Park, along the east-west fire track. This new walking trail provides walkers with an easily accessible 100 km loop throughout Adelaide's coast, suburbs and foothills. For a map of the trail loop [click here](#).

There is a strong community connection within the park including local residents that use the park daily and the Landcare group which has worked within the Park for 25 years to protect and restore the Park (Campbelltown City Council website). During this time, they have showcased the importance of taking individual ownership over improving and enhancing the biodiversity within public areas. The Park allows people who value environmental and community stewardship to contribute to on-ground change that includes removal of rubbish on their walks, identifying undesirable visitor activity, monitoring safety of other park users and helping with weed control. There is a strong sense of ownership and pride prevalent within the community for the park.

3.4 Heritage values

The Park is on the traditional land of Kaurna people who have a connection with country and the biodiversity and natural resources that remains within the Park (IT Copely 2020, pers.comm.). Kaurna people are the traditional custodians of the land and have an interest in managing country to ensure the ongoing health and persistence of the natural environment.

Heritage assets within the Park include the remains of the 123 Australian Special Hospital and its gardens, which were established in 1942. The hospital gardens included an avenue of Chinese Elms and while most of the Chinese Elms are no longer alive, an Avenue of Honour, using South Australian Blue Gums *Eucalyptus leucoxylon*, was established in 2015 as a memorial to those who had enlisted. Signage at the entrance of the Avenue of Honour gives historical information of the site.

3.5 Recreation and fitness

Surveying the park, and subsequent feedback from the consultation process, unveiled a diverse range of visitors. This included bird watchers, photographers, walking groups, individual walkers and runners, school groups and dog walkers. Other users of the Park also include schools (such as St Ignatius), mountain bike riders, local scout groups, orienteering groups and nature groups. Foxfield Recreation Oval similarly has a variety of uses and was observed being used for picnics, a meeting place and exercising dogs. The oval also hosts large events such as car rallies. Next to the Foxfield Oval are tennis courts, a playground and a community hall (owned and managed by Council).

Although a multi-use park serves the community well, there are potential risks associated with inappropriate recreational use such as unapproved seed and plant collection, vandalism and walking off-track.

3.6 Catchment values

Tributaries flow from Black Hill into the Park and merge together to flow into Fifth Creek. In 2012, Fifth Creek was assessed as part of an Aquatic Ecosystem Condition Report and evaluated in context of the actual condition and the expected condition. The expected condition was “very good”, and the observed condition was described as “good”. The creek was demonstrating signs of nutrient overload that can result in poor water quality and increased growth of algae, and this is likely on account of human disturbance (EPA 2012). However, it was noted that the creek was important for rare and sensitive species of macroinvertebrates as well as providing habitat for invertebrate species that are sensitive to pollution. The report reinforced the importance of maintaining the water quality within the creek.

The Fifth Creek system in the Park is an important tributary to the River Torrens. Its location in the Park is the beginning of the urban environment and as such, it has an important upstream function as it can influence the condition of the Torrens through its sediment load, water flow and organic matter.

3.7 Urban cooling

Urban green spaces are appreciated as reducing heat island effects within residential areas. The large *Eucalypt* trees along the eastern boundary would likely reduce afternoon (from the west) summer heat by blocking out or reducing radiation. Vegetation can also provide cooling affects by diverting incoming radiation to evapotranspiration (Ennos 2017). Research concurs that urban parks can have a cooling effect and one study demonstrated that the benefit can be reaped up to 860 metres from the park boundary (Algretawee 2016). The Campbelltown Heat Mapping undertaken in 2018 indicates from the thermal imagery that Wadmore Park currently provides a cooling effect within the majority of the park.



Figure 3: Urban heat mapping. Left hand side: the Park outlined in blue and surrounding area with red the hottest area. Right hand side: a similar sized area with no surrounding vegetation, noting increased heat.

3.8 Community pride

Local residents are able to connect with others through virtue of using the Park. The various tracks within the Park link up with those in Black Hill and the Fifth Creek trail that connects with the River Torrens. This provides opportunities for people to familiarise themselves with the local area and other regular users of the walking trails. There is an evident strong connection of local users within the park who value it for its many virtues.

Visitors and users of the Park could further deepen their appreciation of the Park if they were educated and engaged in opportunities that explained differing perspectives about the park including cultural connections between Kaurna and country, particularly if told through the lens of Kaurna Elders. Further opportunities to deepen their knowledge of the park also exists around the fauna and flora in the park.

3.9 Summary of existing and potential threats

There is a range of existing and potential threats to the Park values that have been identified. These range from minor threats to those that are likely to have considerable negative impacts. The different risks as they relate to the key values are summarised in Table 5. The threats that were significant, or potentially significant (such as fire risk), have been addressed as part of the management recommendations (Section 5).

Table 5: Current and potential threats to Park values

Threats	PARK VALUES								
	Biodiversity	Threatened species	Nature Connection	Historical	Cultural	Recreation	Catchment values	Community connections	Residents
Increased visitors (e.g. numbers per day)	✓	✓	✓						✓
Walking off track	✓	✓					✓		
Side stepping tracks	✓	✓					✓		
Creating new tracks	✓	✓	✓				✓		
Weeds	✓	✓					✓		✓
Fire risk from properties				✓	✓	✓			
Fire risk to visitors and properties				✓	✓	✓	✓	✓	✓
Dogs off leash	✓	✓					✓		
Cycling in the Park	✓	✓	✓						
Lack of regeneration	✓	✓					✓		
Phytophthora	✓	✓	✓			✓	✓		✓
Introduced species	✓	✓				✓	✓		✓
Vandalism and removal of flora and fauna	✓	✓	✓	✓	✓	✓		✓	✓
Abundant species (e.g., Noisy Minors)	✓	✓					✓		
Increased temperature	✓	✓	✓			✓	✓	✓	
Reduced rainfall	✓	✓							
Flooding	✓	✓	✓			✓	✓	✓	
Dumping/Rubbish	✓		✓				✓	✓	✓
Lack of collaboration and coordination between key stakeholders	✓	✓							
Wildfire	✓	✓		✓	✓	✓	✓		✓
Pollution	✓	✓					✓	✓	✓

4. DEVELOPMENT OF THE MANAGEMENT PLAN

The development of the Plan utilised a series of stages to ensure that the key objectives and underpinning recommendations were well considered and included the perspectives and values of stakeholders.

Figure 4 below provides a conceptual schematic of the process for developing the Plan. Several components were iterative with feedback loops to stakeholders and Council.

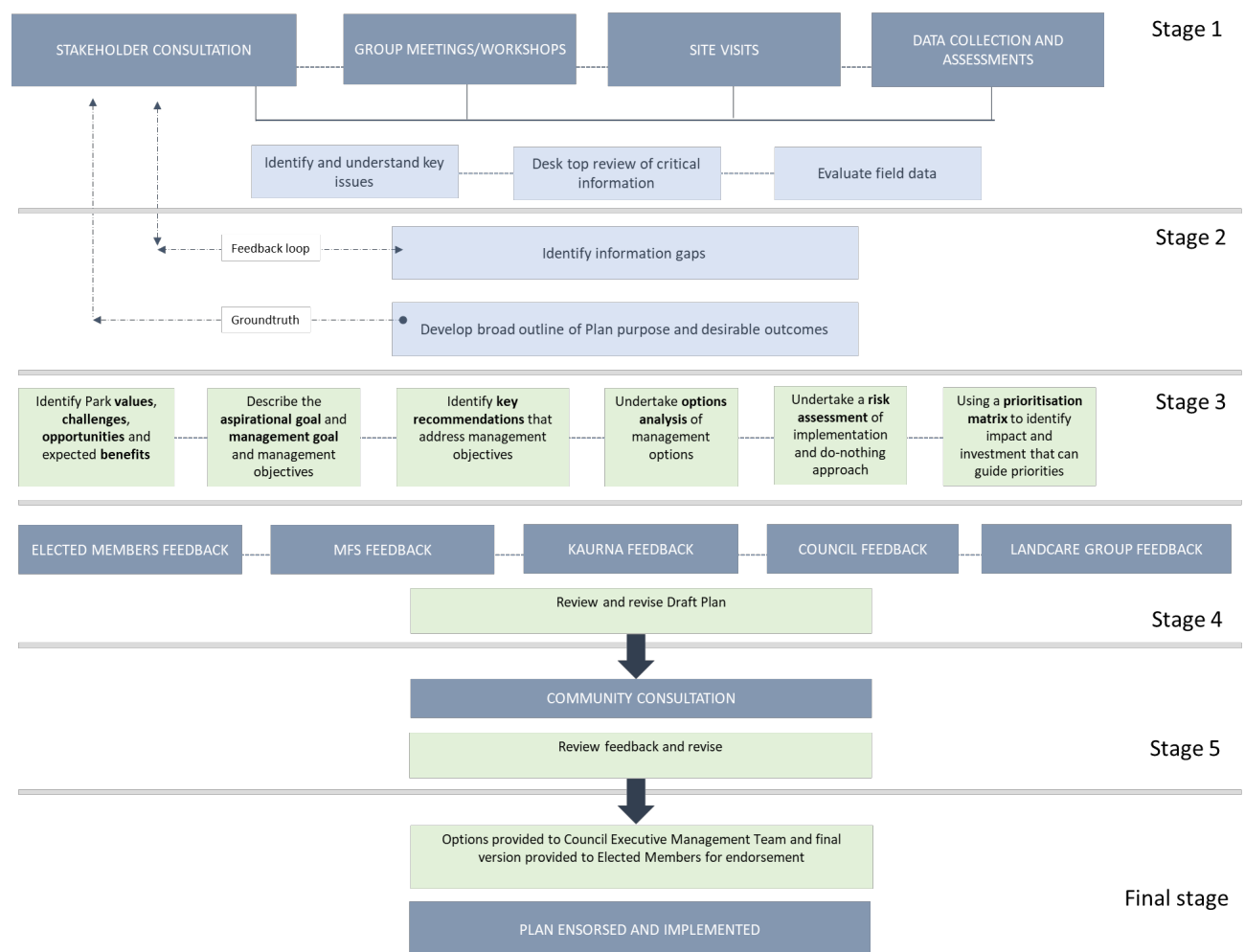


Figure 4: Approach for developing the Management Plan. The blue boxes are key processes and/or groups and the green boxes represent the Plan development

4.1 Stakeholder engagement

A critical process in developing this Plan was engaging some stakeholders to understand what their priorities and expectations were and to seek their historical, technical, and applied knowledge. A list of the people that were engaged is provided in Table 6.

The draft plan was developed after initial discussions with some stakeholders and then revised after the broader consultation. This provided an opportunity to document and consider the perspectives of all users of the Park to provide a balanced view. The feedback from the public consultation was

summarised by Council staff and has been considered and modified accordingly by Management and Elected Members.

Table 6: Stakeholders consulted

Organisation	Core work	Individuals
Campbelltown City Council	Council environment, biodiversity, and sustainability work	Rachael Hamilton, Sue Graham, Wade Della Torre and Andrian Wiguna
Campbelltown Landcare Group	Restoration, biodiversity protection, education and awareness	Site visit: Greg Sproule, Colin Blute, Ros Rose, Dearnne Rich, Marc Ó Conaill, Simon Fahey-Sparks Meeting: Marc Ó Conaill, Colin Blute, Ros Rose, Dearnne Rich and Ingrid Franssen
Wadmore Park Working Group	To provide updates on Councils work within the Park	Rachael Hamilton, Sue Graham, Wade Della Torre, Andrian Wiguna, Henry Haavisto, Aubrey Van Ristell, Max Harris, Christopher Staunton, Remo Paolini, Gary Scott
Department for Environment and Water (Fire)	Fire ecology and Fire operations	Ian Tanner and Andy Sheath
Department for Environment and Water (NPWSA)	Regional ecologist for parks within the MLR (Black Hill neighbouring property)	Anthony Abley
Green Adelaide	Urban ecology and biodiversity	Kirstin Abley and Elisa Sparrow
Local Kurna representative	Cultural information and perspectives	Site visit and discussions: Ivan-Tiwu Copley
Local Field Botanist and contractor	Botanical knowledge, local knowledge and bushland management practitioner	Kieran Brewer
CFS	Fire prevention and preparedness and community education	Paul Stribley
Local Residents input during consultation	Users and protectors of the park	Various
Elected Members & Executive Management Team	Outcomes of consultation and options for consideration	Presentation by Rachael Hamilton

There were key themes that resulted from the consultation and these are summarised below:

- The Park should be managed as a conservation park because of its significant biodiversity value
- The Landcare Group have made considerable progress with weed management and restoration
- Local residents rely on the park for recreation and wellbeing
- Dog walkers believe that having their dogs off-leash did not cause any harm to the park, its biodiversity or other visitors
- The Park is long unburnt and will likely respond favourably to an ecological burn
- Not all visitation is compatible with conserving the health and biodiversity of the Park
- The risk of “loving it to death” should be considered, so while it is important to publicise the nature conservation values of the Park, the specific locations (e.g. of threatened plants) should only be provided with a buffer to avoid unnecessary trampling

- The number of tracks within the Park is excessive, however controlling visitor impact is challenging as people can create new tracks if one is closed off and remove track deterrents (e.g. pulling out plants, moving logs).

It is noted that there were differing viewpoints, which have been tabled. These views were important to document and they have been seriously considered when developing the Plan. Table 7 summarises the different perspectives on some of the issues raised.

Table 7: Differing viewpoints on some key issues

Issue	Different perspectives	
	For	Against
The dominance and spread of <i>Acacia paradoxa</i> should be actively managed via targeted removal	<ul style="list-style-type: none"> - Nothing will grow within the <i>A.paradoxa</i> thickets and they are also a fire risk - The removal of <i>A.paradoxa</i> in partnership with targeted plantings can result in positive biodiversity results 	<ul style="list-style-type: none"> - This species is important for bird habitat and provides protection from predation. - The greatest bird diversity was recorded in areas where there was <i>A.paradoxa</i>
<i>Acacia paradoxa</i> is a fire risk where it occurs along the eastern and southern fire tracks	<ul style="list-style-type: none"> - On Park, The stands of <i>A.paradoxa</i> in proximity to designated fire tracks is a fire risk and could be slashed or trimmed to remove the fire risk - Added value of doing this is the opportunity to create low heath and grassland areas that have greater biodiversity value 	<ul style="list-style-type: none"> - There are other plants and household materials (e.g. brush fencing) that are more of a fire-risk - The fire track is sufficient to protect residents from fire impacts - The species is senescing so will thin out over time naturally
The abundance of <i>Pentameris</i> is a risk to the park and should be prioritised in weed management	<ul style="list-style-type: none"> - This could potentially take over areas within significant vegetation zones - Expert advice was that the grass is allelopathic and will prevent other species from germinating and growing 	<ul style="list-style-type: none"> - It has naturalised and it is unlikely that effort will match results - There are other more important weeds that should be controlled
Dogs off-leash are a problem in the park to the natural assets and potentially visitors	<ul style="list-style-type: none"> - If off-leash they can go into sensitive areas and trample vegetation - They can scare/flush out native fauna (e.g. birds) - There are physical impacts from defecation and urination that can change soil chemistry properties 	<ul style="list-style-type: none"> - Perception that most dog owners are responsible and can recall their dogs on command. - Dog walkers believe that dogs off-leash does not negatively impact on the natural assets of the Park
The open grassy woodland should be managed as a grassland and juvenile	<ul style="list-style-type: none"> - The growth of plantings (trees) will out shade native grasses 	<ul style="list-style-type: none"> - Anecdotal and spatial imagery evidence that the Park has always had overstorey species within this area.

overstorey species thinned out	<ul style="list-style-type: none"> - There are limited remnant grasslands in MLR and Adelaide Plains so they should be conserved - Enough woodland trees/species in other parts of the Park and need open grassy areas for different habitat needs 	<ul style="list-style-type: none"> - The Landcare Group have invested time and resources into plantings - The <i>Callitris</i> plantings are important to maintain within the Park
The Park also contains a riparian zone that requires strategic management	<ul style="list-style-type: none"> - Restoration of the riparian area will require considerable effort and investment and as such, initial focus should be on the heathland and grassland area. - Riparian restoration is not always cost-effective 	<ul style="list-style-type: none"> - The Park is part of the Fifth Creek catchment and has critical buffering functions by ensuring that water flowing into the Torrens is high quality. - There has been limited investment in managing the riparian zone within the Park and this should be prioritised as part of the Management Plan.

4.2 Desk top review

A series of documents were reviewed at the beginning of developing the Plan and subsequently reviewed once the overarching goals and objectives were developed. It is important to acknowledge that the precursor work done by others has contributed to the recommendations within this current Plan.

- Wadmore Park Pulyonna Wirra Management Plan 2013-2018
- Vegetation Management Action Plan for Wadmore Park 2005
- Biodiversity Mapping Condition Report V3
- Wadmore Park Vegetation Integrity Report 2015
- Environmental Management Plan 2016
- Open Space Strategy 2012
- Wadmore Park Pulyonna Wirra Bird Project Report 2019
- Wadmore Park/Pulyonna Wirra and Drainage Reserves Fire Management Plan 2010

4.3 Site visits, assessments, and data collection

A total of 5 field days were spent at the Park and an additional 3 site visits to meet with identified stakeholders.

A mud map of the site was created, and the following features were identified:

- Significant biodiversity areas within the park
- Evident threats and undesirable impacts (e.g. walking off-track and excessive tracks)
- Visitor behaviour and use of the Park
- Areas that could be shifted into a different state with appropriate intervention
- Areas that had a high investment to low impact ratio

The walking tracks were also GPS'd as part of the initial site visits. Subsequent field days were focussed on undertaking biodiversity assessments within 4 discrete vegetation assemblages (see Section 6.8.2).

4.4 Content development approach

The management plan content was developed in an iterative manner that allowed ongoing engagement with stakeholders. After site assessments, stakeholder engagement and reviewing existing information, the overarching values, threats, risks and desirable outcomes were identified. These were ground-truthed with stakeholders and revised accordingly.

This overarching framework informed the development of the aspirational and management goal and the objectives that support these goals. After refining the objectives, a suite of management recommendations was identified that would address the objectives. The next phase required critically appraising different options, risks and prioritisation.

The draft Plan was provided to Council staff for review and then to Council for consideration and endorsement at the March 2nd, 2021 meeting. This draft version was also provided to the Landcare group, CFS and Ivan-Tiwu Copley ahead of public consultation.

4.5 Decision making and implementation

A prioritisation matrix has been developed to assist Council and other stakeholders such as the Landcare Group to agree on the most important priorities so annual work plans can be developed. The matrix is intended to be modified as required and for this reason, the one provided should be considered an example only to demonstrate the process that could be undertaken. This information is provided in Section 7.

5. MANAGEMENT GOALS, PRINCIPLES AND OUTCOMES

5.1 Management plan goals and objectives

There are two overarching goals of this plan.

The aspirational goal is to **conserve, improve and advocate on the biodiversity and nature values of the Park for future generations while also protecting residents from bushfires.**

There is also a management goal to **undertake strategic and targeted management, learn by doing, and balance out different Park uses and expectations.** Essentially this goal provides the “how” to the aspirational goal.

To achieve these goals, 8 management objectives were identified. These are listed below and presented in Figure 5.

1. Trial ecological and cultural burns for biodiversity outcomes
2. Improve the state and trajectory in the Park by removing overabundant undesirable species and other risks
3. Control and mitigate against adverse visitor impacts and support suitable types of visitation
4. Address and implement climate change resilience management and restoration approaches
5. Identify and address existing, potential and/or perceived fire risk to habitat, flora, fauna, residents and visitors - addressing perceived fire risk through clarification and education.
6. Maintain and improve infrastructures that protect park assets and ensures safety of visitors
7. Conserve the cultural and historical values of the Park
8. Monitor and communicate trends, challenges and concerns between stakeholders and adapt management accordingly

These objectives were derived by identifying:

- Current values – What are the valuable park assets? What do stakeholders value about the Park?
- Challenges – What are the challenges (or barriers) to supporting, enhancing, or improving these values?
- Opportunities – What are the possibilities and circumstances that can be drawn on to undertake best park management?
- Benefits – What are the predicted benefits from managing the park in accordance with the aspirational and management goal?

This information has been summarised below as Figure 5.

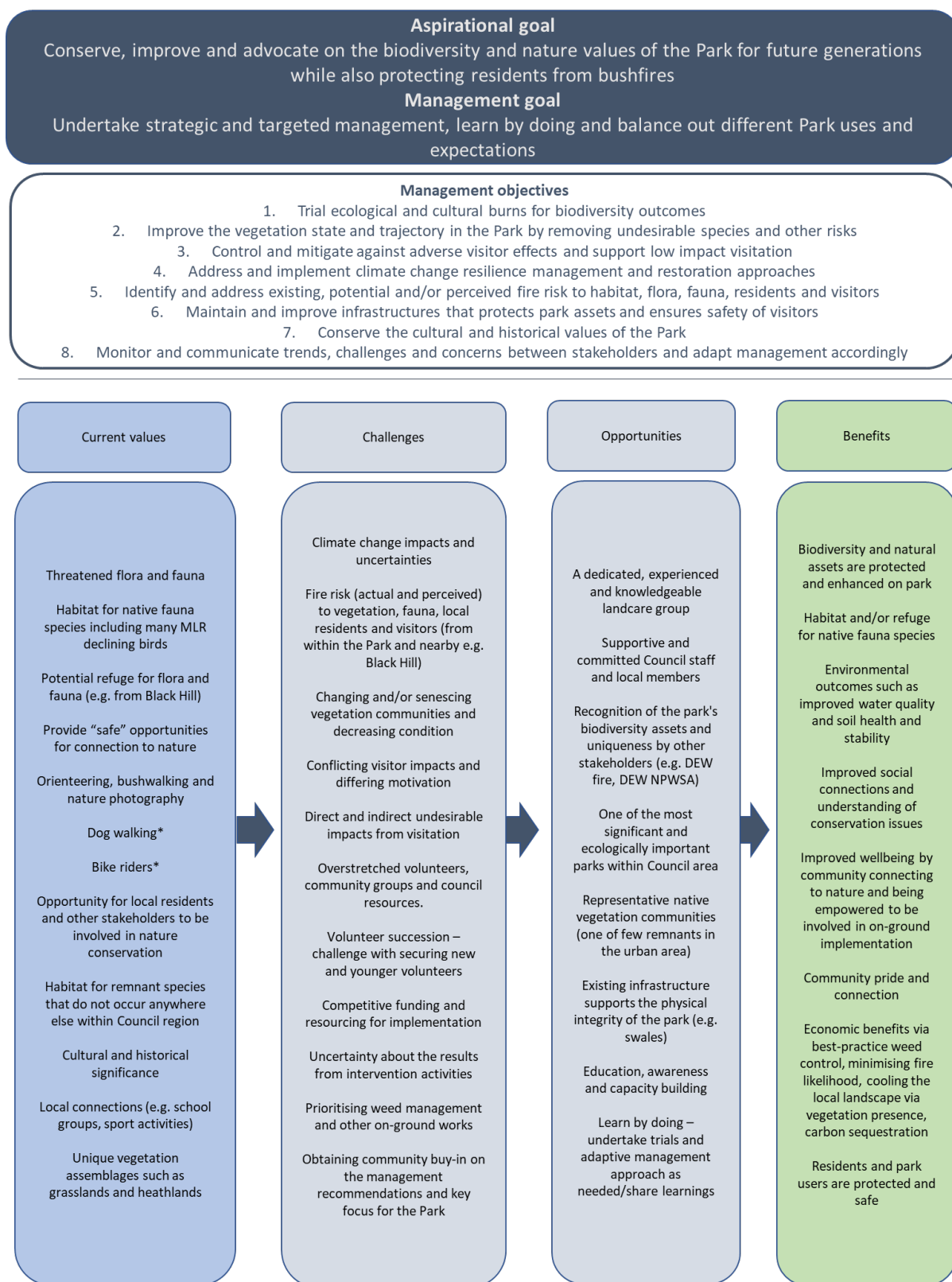


Figure 5: Rationale for the Management Plan

5.2 Desirable outcome statements

In context of the overarching goals and predicted benefits, a suite of desirable outcomes has been developed. Any review or evaluation of this plan can use the outcome statements to assess progress or they can be modified to form key evaluation questions.

The outcome statements are based on *what should the Park be like and how will it be regarded in ten years' time?*

- The Park is healthy and supports diverse flora and fauna species and habitat features increase by 5 percent
- Threatened species in the Park are secure and have increased in population size by 5 percent
- The water quality and quantity, soil health and environmental functions are maintained and enhanced
- The condition and extent of the grass and heath assemblages has increased
- Track erosion and compaction within the Park is demonstrably reduced
- There is negligible evidence of new walking tracks, approximately 75% of the suggested decommissioned tracks have been successfully closed and are regenerating or revegetated
- The Park provides high quality and safe opportunities for people to experience nature, improve wellbeing and connect to the local landscape
- The Park is regarded and appreciated for its ecological and biodiversity value, and visited accordingly
- Council and the Landcare Group showcase the results of using novel restoration and nature conservation approaches
- The Park provides connectivity to areas such as Black Hill Conservation Park and the Fifth Creek system
- There is a reduction in high risk weed species by 10 percent
- Local residents, community and Council understand actual fire risk and address accordingly

5.3 Management Plan principles

This Plan is underpinned by a set of principles that can also be used when evaluating the success of implementing the Plan – the principles are listed below:

- Management of the Park needs to remain adaptable and be responsive to emerging and unpredicted threats and priorities
- Ongoing communication and collaboration are the backbone to efficient and effective delivery
- It requires adequate, regular and ongoing investment in terms of Council budget and human resources (Council and the Landcare Group)
- Learnings and observations should be documented and shared between stakeholders to enable continuous improvements
- Conservation and biodiversity “wins” are not always evident within a 5-year time frame and subtle trends should be also be identified
- Priority areas and activities should be determined by:
 - Intact and high-quality vegetation
 - Priority vegetation communities
 - Habitat for threatened plant and animal species
 - Priority weed species
 - Critical ecological services and functions

- Activities that will result in climate change resilience
- Ensuring safety of visitors and residents
- Protection of wildlife.

6 MANAGEMENT RECOMMENDATIONS

There are 29 core recommendations and 6 value-add recommendations that support the management objectives. These recommendations are a combination of activities and approaches that relate to on-ground delivery, strategic partnerships, and preparatory work (that supports delivery). There is sometimes overlap or complementarity between the recommendations, and these have been identified and provided in Section 6 as Table 9.

An options analysis has also been undertaken in context of *what would the Park be like and how will it be viewed in ten years' time?* under three different scenarios:

1. **Do-nothing** – what will the condition of the Park be in 10 years' time if the work is not implemented
2. **Prepare and plan** – what will the condition of the Park be in 10 years' time if the work is planned but not delivered until 2026
3. **Implement** – what will the condition of the Park be in 10 years' time if the work is implemented within 2021-2026

The acceptable and unacceptable activities within the Park is provided below as Table 8. A risk assessment of the management recommendations has also been undertaken and is provided in Section 7.

Table 8: Acceptable and unacceptable Park use

Park activity	Acceptable and allowed	Notes
Unauthorised collection of plant material (this includes cutting and removing)	NO	Only with permission from Council and Native Vegetation Council if required (on advice from Council)
Unauthorised collection of plant seed	NO	Only with permission from Council and Native Vegetation Council if required (on advice from Council)
Passive bike riding on existing tracks and trails within the Park	YES	See section 6.3.4 for understanding about passive bike riding
Using mountain bikes on within the Park east of Fifth Creek	NO	See section 6.3.4 for rationale about why this is disallowed
Dogs off leash within the Park east of Fifth Creek	NO	See section 6.3.2
Dogs off leash within the Park west of Fifth Creek (Foxfield Oval section)	YES	See section 6.3.2
Dumping of rubbish, waste, materials (includes garden waste)	NO	This activity is prohibited by residents, local community, the general public and Council staff. If this activity is observed, it should be reported to Council
Weed management	YES - conditional	This should only be undertaken by the CLG in partnership with Council, or by a contractor that has been engaged or approved by Council
Disturbing, catching or handling native fauna	NO	Strictly prohibited
Disturbing, catching or handling introduced fauna	NO	Although pest animal species such as feral cats and foxes may occur within the Park, Council is responsible for feral animal management within the Park
Walking, hiking or running on existing tracks and trails within the Park	YES	People should stay on existing paths
Burning or lighting fires within the Park	NO	Strictly prohibited

Picnics and social gatherings	YES - conditional	This can occur within the Foxfield Oval area and along existing paths and tracks but is not allowed within the native vegetation areas
Nature Play	YES - conditional	This can occur within the Foxfield Oval area and along existing paths and tracks but is not allowed within the native vegetation areas
Orienteering	YES - conditional	Approval must be sought from Council and any specifications followed
Removal of rubbish and litter	YES	Any material that is obviously rubbish and would ordinarily be disposed within the Park bins, can be collected and should be disposed in the Park bins
Research and monitoring	YES	Council should be notified to ensure that any research or monitoring activities are not occurring in sensitive areas

6.1 Trial ecological and cultural burns for biodiversity outcomes

6.1.1 Convene a working group to co-develop an ecological burn proposal and a cultural burn proposal (1a)

Undertaking a planned burn requires a detailed and evidence-based proposal that provides information on rationale, methodology (including timing of the burn), operational processes, legal approvals required, implementation schedule, risk assessment and monitoring needs. The predicted resourcing and investment should also be estimated.

It is suggested that an overarching burn proposal be co-developed by key stakeholders with stand-alone sections for both the ecological burn and the cultural burn. There is considerable knowledge and expertise on ecological burning for biodiversity outcomes and these should be actively sought and included in the burn proposals.

The South Australian Government has developed guidelines for implementing ecological burns and this could be used to direct the burn proposal design and content for the Park. This document can be found online [click here](#). The Council could also consider making the burn proposal available to the public and residents and convening a workshop to address any concerns.

It is suggested that the following groups and organisations be represented on the working group:

- Council (representative from fire prevention and biodiversity)
- The Landcare Group
- DEW Fire
- Local Kaurna and/or cultural burns expert
- DEW National Parks and Wildlife
- CFS or MFS
- A local resident

6.1.2 Develop a user-friendly fact sheet on ecological and cultural burns (1b)

It is important that the community and residents understand and appreciate the purpose of ecological and cultural burns and how this purpose is different to fuel reduction burns. The fact sheet should also:

- Provide information on the risks associated with undertaking ecological burns and the mitigation strategies for addressing these threats (such as ember attacks, smoke inhalation)
- Provide an example/s or case study of an ecological burn and the biodiversity outcomes that resulted
- Clearly describe what the expected benefits are
- Identify who will be involved.

Following the dissemination of the fact sheets, Council should provide residents with an opportunity to meet with them and others who have experience in ecological burns. A street corner type meeting would suit this need.

6.1.3 Implement an ecological trial burn in the priority area (1c)

The Park is mostly long unburnt with the last recorded major fire event in 1976. Fire history after this time is limited with only 4 small patch burns that were the likely result of arson.

The Park is habitat to a diversity of plant species, many of which are known to respond favourably to a burn or require a burn for ongoing persistence. Ecological burns stimulate the seed bank and regeneration which results in healthy successional processes. This results in vegetation at different age-classes which provides diverse habitat for a variety of fauna species. The soil seed bank possibly stores material of plant species that are declining or no longer present, and a fire will stimulate germination of these plants.

Approximately 64% of the threatened bird species that have been recorded within, or surrounding the Park, require heathland habitat components (see Table 4). The heathland areas within the Park only persist as small pockets and it is critical that intervention work is undertaken (such as fire) to stimulate germination and ongoing persistence of key heathland species. The Park is also habitat to two nationally threatened *Prasophyllum* (orchid) species that are known to respond positively to an autumn burn. Ecological burns within the Mount Lofty Ranges have resulted in positive biodiversity outcomes, including increased populations of endangered plants such as *Prasophyllum*.

The preferred timing of the burn will need to be explored in the burn proposal (see Section 6.1.1), however an autumn burn should be considered as this has the advantage of proceeding winter rains. An autumn burn is also less likely to impact on the breeding and fledging season of birds. Other factors should be considered such as the life cycle of introduced weeds and germination requirements of any target species.

Any ecological burn must undertake risk assessments, and this includes considering the likely weed management requirements post burn. The costs and resourcing requirements of undertaking post-fire weed control should be estimated and funds committed for 3-5 years prior to undertaking the burn. It is also important to identify the presence of fauna and/or fauna habitat (such as hollows) within the proposed burn areas and ensure there are refuge areas for wildlife. The proposed burn site should be comprehensively surveyed for highly endangered bird species such as the Chestnut-rumped Heathwren to ensure they are not currently using the area.

The area identified in Appendix 1 has been proposed as an ecological burn trial.

It is strongly advised that an ecological burn is not implemented until recommendation 6.1.1 and 6.1.2 have been completed.

6.1.4 Work with Kurna to trial a cultural burn within the grassy woodland area (1d)

Council and the Landcare Group have shown interest in working with Kurna, cultural bearers and Aboriginal fire practitioners to trial a cultural burn on the Park. This provides an opportunity for learning by doing by working with Kurna to implement traditional fire practices. Kurna Elder, Ivan-Tiwu Copley has provided suggestions for implementing a circular mosaic cold burn that involves and engages with Kurna people. It is recommended that Kurna people be engaged at all stages of planning and implementation, with an opportunity for site visits before developing the proposal.

The Landcare Group have been successful in getting a grassroots grant that will fund a cultural burn workshop. This workshop will bring together Kurna people, local stakeholders and an experienced Aboriginal fire expert and practitioner. The workshop will significantly progress the opportunity to plan and implement a cultural burn.

It is recommended that a cultural burn (cool burn) be undertaken within the Grassy Woodland area where other trials have also been proposed (see Sections 6.2.2, 6.2.3, 6.2.4). The cultural burn will have multiple and complementary benefits such as providing an opportunity for traditional

restoration implementation, increasing native grass diversity and providing community awareness on novel conservation approaches. Figure 5 demonstrates how a cultural burn could be trialled in partnership with other grassland restoration methods.

Monitoring the response of the vegetation to a cool cultural burn will be important for future decision making and adaptive management.

A proposed site for implemented a cultural burn is provided in the priority ecological management zones, Appendix 1.

Value-add recommendations

6.1.5 Conduct soil seedbank trials within the proposed burn areas (1e)

Determining the seed bank composition and the approximate abundance of seeds will enable predictions about the vegetation recruitment post-fire (native and weed species). This could be undertaken as part of an external research project or in collaboration with the local school or community groups. Alternatively, it could be undertaken by Council or the Landcare group. Information from this study could also inform climate change resilience strategies as soil seed banks can protect vegetation diversity against above-ground extinction of species.

There are various methodologies for seed bank studies and protocols to minimise disturbance, reduce weed invasion and prevent the spread of pathogens. It should also be noted that results from the seedbank trial will not conclusively determine what the response will be after fire because there are other drivers such as seed viability, germination cues, seed abundances and soil health and microbial activity.

6.1.6 Organise a field day to view the results from other ecological burns (1f)

There have been several control burns within Black Hill and Morialta Conservation Parks and stakeholders can observe the results from these burns. The focus should be on visiting sites that were burnt for ecological purposes rather than fuel reduction, although the latter would also be informative. Similarly, organising field site visits to areas out of the Council region where burns were undertaken specifically for threatened species recovery and rejuvenation of vegetation communities would be enlightening. There are staff within DEW with fire ecology knowledge who could provide advice on appropriate sites.

6.1.7 Scenario analysis for objective and recommendations

Scenario	Predicted result of each scenario
Do-nothing	<ul style="list-style-type: none"> - Ongoing decline of significant and threatened flora species - Undesirable shift in vegetation communities (dominated by competitive and long-lived species) - Deteriorating habitat for fauna species - Reduced regeneration - Reduced amenity value - Reputational loss as the significant values of the Park are not being actively managed - Homogenous and unhealthy vegetation - Reduced habitat complexities

	<ul style="list-style-type: none"> - Reduced community and stakeholder momentum/disengagement
Prepare and plan	<ul style="list-style-type: none"> - Ongoing decline of significant and threatened flora species - Shift in vegetation communities to a lesser condition - Reduced regeneration - Deteriorating habitat for fauna species - Community and stakeholders still inspired and committed
Implement	<ul style="list-style-type: none"> - Increased population of significant and threatened flora species - Desirable shift in vegetation community (more heathland, more native grassland) - Improved habitat and food sources for fauna species (e.g. regenerating vegetation increases invertebrate diversity and abundance and increases flowering activity) - Seedbank activated and increased regeneration (and possibly of new or declining species) - Reinvigorates the seedbank via new flowering activity - Improved amenity value as senescing/deteriorating vegetation is replaced by new growth - Demonstration of novel and fresh approaches to management - Increased habitat complexity as range of vegetation/structures at different age-classes - Community interest in ecological and cultural burns - Demonstrated commitment to working with Kaurua and respecting cultural partnerships - Community pride in an active and committed Council - Opportunity for key stakeholders, such as the Landcare Group to extend their work skills and experience (and also opportunity to utilise their skills) - Potential research and partnerships with Universities and/or local schools

6.2 Improve the vegetation state and trajectory in the Park by controlling undesirable species and risks

6.2.1 Trial the removal of *Acacia paradoxa* in priority heathland areas, monitor invasion fronts and provide supplementary plantings (2a)

The presence and recruitment of *Acacia paradoxa* is widespread throughout the Park. There is speculation that the type of *A. paradoxa* within the Park was introduced to the area, although this is unconfirmed (Brewer 2005; Brewer 2020 pers.comm). The *A. paradoxa* population within the Park is described as “plains form” and is distinguished by its narrow and hairy seed pods and dark green foliage. In contrast, the “hills form” has smooth and wide pods with leaves that are lime-green and three times larger than the *A. paradoxa* type that occurs in the Park (Brewer 2005; Brewer 2020 pers.comm.).

A recent biodiversity assessment concluded that the heathland areas are a significant native vegetation asset within the Park (Duffield and Jeffery 2020). This finding is consistent with feedback provided by stakeholders and reinforces the need to prioritise the management of these areas. There are patches of *A. paradoxa* surrounding and encroaching into these heathland areas and this poses a threat to the health, diversity and integrity of the heathland patches.

Targeted removal of *A. paradoxa* within heathland patches could be identified and strategically implemented (see priority ecological management zones, Appendix 1). Ideally the location of the individuals that are proposed for removal will be documented and agreed between Council and the Landcare Group. This should initially be approached as a trial to assess the outcomes and identify

any unintended impacts. It is suggested that the removal of *A.paradoxa* be complemented with low shrub and tussock plantings using species that are typical of this community such as *Calytrix tetragona*, *Hibbertia* species, *Lomandra* species, *Lepidosperma* species, *Astroloma humifusum*, *Stenanthera conostephioides* and native pea species. The location of the removed *A.paradoxa* should be marked or GPS coordinates recorded so the site can be monitored in case weed species germinate or there is new recruitment of *A.paradoxa*.

When conducting the removal, best-practice and minimal impact operational procedures should be followed include machinery and footwear Phytophthora hygiene.

Caveat

It is recognised that patches of *A.paradoxa* are considered critical for threatened bird species including Chestnut-rumped Heathwren and White-browed Babbler (Brewer 2005). A recent survey by Fahey-Sparks (2019) noted the absence of these species but also acknowledged that this could be because of broader landscape issues. However, while researching habitat requirements of the Chestnut-rumped Heathwren, it was noted that they are known to occur in “*Eucalyptus leucoxylon* +/- *E. fasciculosa* woodland, over *Allocasuarina verticillata*, *Acacia paradoxa*, *Calytrix tetragona* & *Astroloma conostephioides*” (Nature Maps). The decline of the Chestnut-rumped Heathwren could also be because of deteriorating condition and limited regeneration of these heath species. The last official sighting of the Chestnut-rumped Heathwren was in 1975 (source: NatureMaps) and so it is difficult to correlate cause with decline.

6.2.2 Trial intervention approaches to enhance and restore native grasses

There was consensus about the importance of native grass conservation and restoration within the Park. However, there were different perspectives on the appropriateness of the overstorey species within the grassy woodland area (see Table 5). Input from a grassland botanist suggested that trees closer than 30-50 metre apart will displace grassland specialist species as the canopy overshadows the grasses (Ann Prescott 2020 pers. comm).

There is scope to facilitate the different perspectives by applying an adaptive management approach to test the most effective options for grassland restoration. A small-scale trial (such as 15mx15m) could be established that complements the other work within the grassy woodland area (see Sections 6.1.3 and 6.2.3). It has been suggested that regenerating or young shrub and tree plantings could be thinned out to provide opportunities for native grass recruitment.

Figure 6 provides an example design for trialling this work. Within a defined area, four different management techniques can be trialled to assess the different responses, which of the responses were beneficial and which ones were not. Council and the Landcare Group, in partnership with other stakeholders, should determine the specific location for the trial. It is recommended that the trial site should be established within an area of “advantage”, that being a site where there are healthy and diverse native grass species and less introduced grasses (if possible). The plot should be monitored regularly over a 4-5 years period to assess the changes that have occurred and compare these to a reference plot (the control).

To maintain the integrity of the trial and the recommendations within this Management Plan, there should be no additional plantings of trees or shrubs within this area. The inclusion of grassland specialist small herbs, ground covers or native grasses could be considered and mutually agreed between Council and the Landcare Group.

This work complements other management recommendations, specifically:

- Work with Kaurna to trial a cultural burn (6.1.2), and
- Trial slashing in the grassy woodland area (6.2.3).

See Appendix 1.

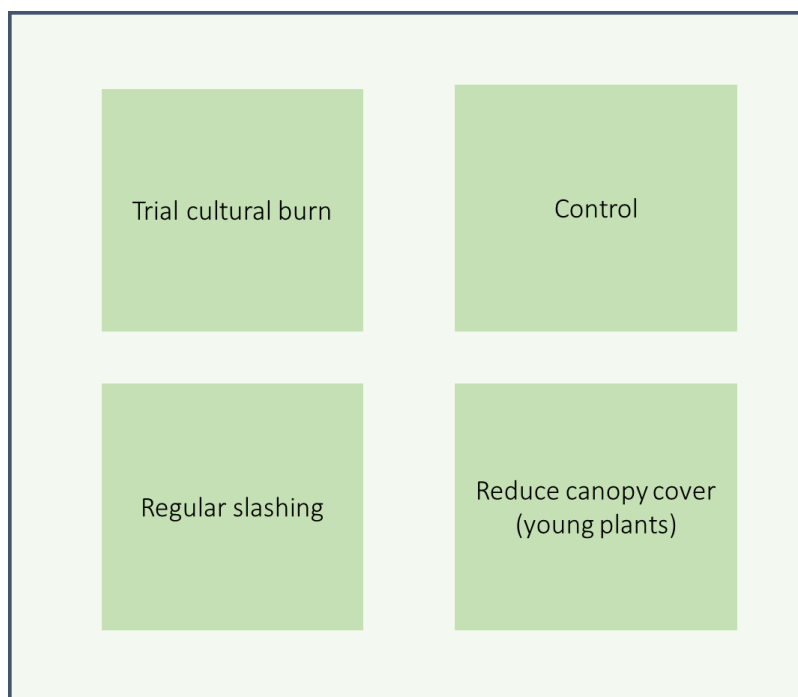


Figure 6: An example trial design for native grass restoration

6.2.3 Trial slashing in the grassy woodland area (2c)

The Grassy Woodland area would benefit from management to increase the presence and recruitment of perennial native grasses and grassland species and decrease exotic grasses. Slashing trials within this zone will provide guidance for future management. The trials should be undertaken in defined areas and surveyed before and after slashing.

Machinery hygiene will be an important factor in this process to minimise the potential of spreading weed seed. Slashing should occur in areas of least weed infestation first, moving to the more degraded areas, and machinery to be thoroughly cleaned prior to moving to a new area and, especially, to a new site.

Two types of slashing trials are recommended:

1. To manage *Pentameris pallida*, trials would involve repeated slashing, low to the ground, and prior to the flowering stage (autumn – early spring). This should be undertaken in an area where *P. pallida* is dominating, and a minimal presence of native flora (A Prescott 2020 pers. Comm). Care should be taken to exclude native species from slashing in the trial site to allow seed to form and the potential for recruitment of native flora.
2. To increase native grass diversity and cover, trials should be undertaken in areas dominated by native grasses. Where *Themeda triandra* dominates, the primary objective would be to remove old foliage to allow for new growth of existing plants and, therefore, the removal of cut vegetation after slashing may be of benefit. Additionally, *T. triandra* trials would not

necessarily be constrained by seed set. In contrast, it is recommended that where *Austrostipa* spp. dominate, seed be allowed to set to encourage recruitment of new plants.

Currently Council undertakes general slashing of the Grassy Woodland area to allay community concern about perceived fuel load prior to fire season. A better understanding of actual fuel hazard and biology of the flora within the zone should guide slashing necessity and timing. Communication between the Council staff and/or relevant contractors about management of the zone is imperative and, again, machinery hygiene is important to alleviate the risk of spreading weed seed to other reserves. The perceived fire risk of native grasses should be addressed within the fact-sheet (Recommendation 1b, Section 6.1.2).

6.2.4 Weed management of priority weed species (2d)

General bushcare principles recommend that weed control be prioritised in areas with the best native vegetation condition. This principle has been applied in the Park already, using guidance from the Wadmore Park/Pulyonna Wirra Management Plan 2013-2018 and the Vegetation Management Action Plan, Wadmore Park (Brewer 2005), with priority weeds such as Bridal Creeper *Asparagus asparagoides* being well managed.

Biodiversity condition surveys in 2020 indicated that, overall, the Open Heathland area scored highest. Despite this, the Shrubby and Grassy Woodland vegetation communities encompassed areas that were similarly significant, and for this reason, they have been broken into categories of good, moderate and poor. The condition categories are based on the following general characteristics:

- Good condition = high diversity of native flora species, structural features and age classes; biomass of exotic species <30%,
- Moderate condition = moderate diversity of native species; limited number of species that are recruiting; biomass of exotic understorey species 30 - 70%,
- Poor condition = low native species diversity; no (or very little) plant recruitment; biomass of exotic understorey species >70%.

The threat rating of individual weed species has been taken from the Native Vegetation Council Bushland Assessment Manual ([click here](#)) weed threat ratings and combined with the vegetation community condition categories to produce a matrix. This matrix can guide the prioritisation of weed management in the Park - Table 9.

Using this method, a given weed species may have a differing prioritisation within different areas of each plant community. For example, management of *Pentameris pallida* has been recommended as 'do immediately' in good Shrubby Woodland patches, while in the moderate Shrubby Woodland it has been allocated a 'schedule and plan' action.

Where no priority or action is indicated, it is assumed that resources will not allow for the weed to be targeted in that area. For example, it is deemed a 'schedule and plan' action to control *Bromus diandrus* in the Open heathland and 'good' Shrubby woodland, and a 'fill-in' action in the 'good' Grassy woodland, but it is unlikely that resources could extend to 'moderate' or 'poor' condition areas. This scenario would also apply to most weeds with a low threat rating. Most annual exotic grasses, such as *Bromus diandrus* and *Avena* spp., have a low weed threat rating but may not be as concerning as the exotic perennial grass *Pentameris pallida*.

Table 9: Prioritisation of weed species based on location - c=control, m=manage and control as needed

Weed Species		good			moderate			poor	
		Open heath land	Shrubby woodland	Grassy woodland	Shrubby woodland	Grassy woodland	Riparian woodland	Shrubby woodland	Grassy woodland
Botanical Name	Common Name								
<i>Asparagus asparagoides</i>	Bridal Creeper	c	c	c	c	c	m	c	c
<i>Ehrharta calycina</i>	Perennial Veldt Grass	m	m	m	m	m	m	m	m
<i>Cytisus scoparius</i>	English Broom	m	m	m	m	m	c	m	m
<i>Olea europaea</i> ssp.	Olive	c	m	m	m	m	m	m	m
<i>Disa bracteata</i>	South African Weed Orchid	c	m	c	m	c	m	m	c
<i>Oxalis pes-caprae</i>	Soursob	m	c	c	c	c	c	c	c
<i>Allium triquetrum</i>	Three-cornered Garlic	c	m	m	m	m	c	m	m
<i>Sparaxis bulbifera</i>	Sparaxis	c	c	c	c	c	m	c	c
<i>Zantedeschia aethiopica</i>	White Arum-lily	m	m	m	m	m	c	m	m
<i>Gazania</i> sp.	Gazania	c	c	m	c	m	m	c	m
<i>Gladiolus undulatus</i>	Wild Gladiolus	m	m	m	m	m	c	m	m
<i>Cenchrus clandestinus</i>	Kikuyu	m	m	m	m	m	c	m	m
<i>Moraea flaccida</i>	One-leaf Cape Tulip	m	m	c	m	c	m	m	c
<i>Euphorbia terracina</i>	False Caper	m	c	m	c	m	c	c	m
<i>Pentameris pallida</i>	Pussytail	c	c	c	c	c	m	c	c
<i>Hypochaeris radicata</i>	Rough Cat's Ear	m	m	m	m	m	c		
<i>Lathyrus tingitanus</i>	Tangier Pea	m	m	m	m	m	c		
<i>Erodium aureum</i>		m	m	c	m	c	m		
<i>Echium plantagineum</i>	Salvation Jane	m	c	c	c	c	m		
<i>Brassica</i> sp.		m	c	m	c	m	c		
<i>Vicia sativa</i> ssp.	Common Vetch	c	c	c	c	c	m		
<i>Arctotheca calendula</i>	Capeweed	c	c	c	c	c	m		
<i>Avena</i> sp.	Oat	c	c	c	c	c	c		
<i>Medicago polymorpha</i>	Burr-medic	m	c	c	c	c	c		
<i>Moraea setifolia</i>	Thread Iris	m	c	m	c	m	c		
<i>Briza maxima</i>	Large Quaking-grass	c	c	c	c	c	c		
<i>Ehrharta longiflora</i>	Annual Veldt Grass	c	c	c	c	c	c		
<i>Plantago lanceolata</i> var.	Ribwort	c	c	c	c	c	c		
<i>Romulea rosea</i> var. <i>australis</i>	Common Onion-grass	c	m	m	m	m	m		
<i>Trifolium angustifolium</i>	Narrow-leaf Clover	c	c	m	c	m	c		
<i>Trifolium arvense</i> var. <i>arvense</i>	Hare's-foot Clover	c	c	m	c	m	c		
<i>Trifolium campestre</i>	Hop Clover	c	c	m	c	m	c		
<i>Vulpia</i> sp.	Fescue	c	c	c	c	c	m		
<i>Galium aparine</i>	Cleavers	m	m	m	m	m	c		
<i>Rumex conglomeratus</i>	Clustered Dock	m	m	m	m	m	c		
<i>Helminthotheca echioides</i>	Ox-tongue	m	m	m	m	m	c		
<i>Fumaria</i> sp.	Fumitory	m	c	m					
<i>Hordeum leporinum</i>	Ox-tongue	m	m	c					
<i>Bromus diandrus</i>	Great Brome	c	c	c					
<i>Lolium rigidum</i>	Wimmera Ryegrass	m	m	c					
<i>Lysimachia arvensis</i>	Pimpernel	m	c	m					
<i>Sonchus oleraceus</i>	Common Sow-thistle	m	c	m					
<i>Aira</i> sp.	Hair-grass	c	c	m					
<i>Hypochaeris glabra</i>	Smooth Cat's Ear	c	c	c					

	Do immediately
	Schedule and plan
	Fill-ins
	Postpone or delegate

6.2.5 Ongoing monitoring of PC and sample tests within dieback areas (2e)

Although there are no records of *Phytophthora* infection within or close to the Park, it is important that any assumed dieback is investigated. It is suggested that *Phytophthora* should still be considered a risk because of the high visitation and susceptibility of several resident plant species.

Best practice *Phytophthora* hygiene should be encouraged, and this includes:

- Avoid walking in areas that are wet and sticky
- Stay on tracks to avoid the spread of infested soil
- Brush off and clean all vehicles, boots and other equipment (if in contact with substrates) being entering an area
- Ensure that footwear and equipment is cleaned (arriving and leaving the Park)
 - A hard brush to clean footwear
 - Methylated Sprits (undiluted) or household bleach (diluted 1-part bleach with 4 parts water) and a spray bottle to apply it

Council could also consider providing a washdown or hygiene station at one of the main park entrances. This might not be cost-effective however as visitors have access to a range of entrance points therefore community awareness on *Phytophthora* hygiene practices might be a more effective approach.

Value-add recommendation

6.2.6 Trial soil inoculation in priority areas (2f)

Exogenous landscape impacts and in-situ environmental changes can cause deterioration of soil and microbial health that might prevent natural regeneration and/or revegetation success. Soil processes and condition can affect the transition of a degraded state to a restored ecosystem. There is evidence that soil inocula can be used as an effective restoration tool to shift disturbed areas into healthy plant communities (Wubs et al 2016). A study undertaken by CSIRO concluded that mycorrhizal inoculation expedites the establishment of vegetation cover and restores diverse communities (Neuenkamp 2019).

This work would also value-add to other management actions that aim to improve the population of *Prasophyllum* species within the Park (such as ecological burns). This genus relies on symbiotic fungi within substrates to inoculate the seed bank as the seeds need to bond with fungi for germination (Freestone 2018).

Council and the Landcare Group could seek external interest (such as via a research project), to sample soils within priority areas to assess soil microbiology and above ground fungal diversity. If the soil microbial diversity and health is poor, inoculation as a restoration tool could be considered.

6.2.7 Scenario analysis for objective and recommendations

Scenario	Predicted result of each scenario
Do-nothing	<ul style="list-style-type: none"> - Increase abundance and range of <i>Acacia paradoxa</i> - Potential increased fuel loads within the Park (exposing visitors and local residents to fire risks) - Decline of the heathland area and loss of key species endemic to the region - Shift in vegetation communities - Increase in weed diversity and weed cover within the Park - Decline in abundance and diversity of existing native grass species - Declining condition of grass species as no new recruitment - Undetected PC presence results in significant dieback and spreads into Black Hill CP - Soil health continues to be a knowledge gap and potentially limits natural regeneration - Weed species spreads into other areas (such as private properties, other Council reserves and Black Hill CP)
Prepare and plan	<ul style="list-style-type: none"> - Increase abundance and range of <i>Acacia paradoxa</i> - Potential increased fuel loads within the Park (exposing visitors and local residents to fire risks) - Decline of the heathland area and loss of key species endemic to the region - Shift in vegetation communities - Increase in weed diversity and weed cover within the Park - Decline in abundance and diversity of existing native grass species - Declining condition of grass species as no new recruitment - Weed species spreads into other areas (such as private properties, other Council reserves and Black Hill CP)
Implement	<ul style="list-style-type: none"> - Improved condition and plant diversity in areas where <i>Acacia paradoxa</i> has been removed - Improved knowledge based on ways to manage <i>A.paradoxa</i> for better biodiversity outcomes - Ability to monitor improvements and consider further removals of <i>A.paradoxa</i> - Expansion of heathland area and increase in heath species - Reduced fuel loads within the Park and reduced risk to residents and visitors - Increased native grass diversity and abundance and climate change resilience - Ability to showcase learning by doing approach and share learnings with others - Improved soil health (and Fungi diversity) via soil microbial activity - Decrease in abundance and risk of weed species - Improved habitat and food sources for fauna species - Ability to be responsive to any PC issues and protect Black Hill CP and other Council reserves - Maintained relations with neighbouring properties as weeds are not spreading into other areas

6.3 Control and mitigate against adverse visitor effects and support low impact visitation

Park usage and visitor impacts can be managed to ensure the significant ecological and biodiversity values of the Park are protected. The Park currently allows a range of uses that are not always compatible with one another or the high priority values of the Park. These are discussed within this section. A full list of permitted activities within the park are provided in table 8.

6.3.1 Close walking tracks in areas of high vegetation value (3a)

Currently Council estimates that the Park has 7.4km of walking tracks (Campbelltown City Council website). This is considered excessive for a Park of this size that supports critical biodiversity. At the time of developing this Plan, there was evidence of newly created tracks or sidestepping from existing tracks. Apart from the obvious compaction and trampling impacts from off-track dispersal, there are other unseen impacts such as modifying fauna behaviour and carrying in weed seeds and pathogens.

This Plan has identified some existing paths that should be decommissioned and can be seen in Appendix 1. There is an opportunity to close-off additional tracks and these could be prioritised by:

- Location of highly threatened species and sensitive species
- Evidence of additional track radiating from existing tracks
- Evidence of visitor off-track dispersal
- Unsafe substrates and location of tracks

The decommissioning of tracks should be supported with targeted revegetation and weed management. Council and the Landcare Group have successfully rehabilitated some tracks within the Park therefore a similar approach could be implemented.

6.3.2 Implement and support community to transition to a dogs-on-leash policy (3b)

There is a section of the local community that walk their dogs off-lead within the park and are passionate about, and value being able to do so off lead currently in the park. The rules within the park are inconsistent, and potentially confusing for park users, as current requirements are for dogs to be on a leash along the eastern park boundary track however, they are not required to be on a leash within the Park. It is recommended that Council transition to a dogs-on-leash policy for within the Park, excluding Foxfield Oval section that is west of Fourth Creek. It is proposed that the transition is implemented as:

- Adoption of the plan– Local residents are made aware of the upcoming changes and new signage is designed to reflect the dogs-on-leash policy. Council staff to monitor dog-walking activities within the Park and record positive and negative behaviour. Dog walkers are encouraged to walk their dog-on-leash during this time.
- 12 months – Council to support dog walkers by providing information on alternative routes for walking dogs off-leash. New signage is erected within the Park. Council to monitor dog-walking activities within the Park and remind users that their dogs should be on a leash.
- Council to review dog-walking within the Park after 2 years and make this information publicly available.

Dogs off-leash can have a significant impact on biodiversity, regeneration, soil health and water quality. While undertaking field work, an estimated 10-15% were on-leash, easily recalled or stayed on existing tracks. The remaining dogs were free to walk throughout the Park and off the walking tracks and/or the owners were not able to recall. Dogs that meander throughout the Park can directly impact on the Park by trampling on seedling recruitment and/or threatened species, bringing in weed seeds from the edge of the Park into the core areas and disturbing birds and other wildlife. Similarly, there are impacts (albeit unintended) from dog-owners who walk off track to retrieve their dogs. There is an additional risk of dogs killing native fauna, particularly small mammals, birds and reptiles. There have been instances where Fauna Rescue have been called to care for an injured Koala on account of dog attacks (M Ó Conaill 2020, pers.comm.). It is acknowledged that many dog owners are responsible and will keep their dogs on leash if they are not confident that they can prevent them from entering the Park. It is also acknowledged that the dog owners who participated in the public consultation, believed that their dogs off-leash did not have negative impacts. However, there are unseen effects from dogs in parks such as modifying the behaviour of native fauna (nesting and breeding e.g. nest evacuation or premature fledging rates) and altering the nutrient balance in soils (because of urination and defecation) (Holderness-Roddam, B 2011).

It is also acknowledged that other non-native mammals can also have an impact on the biodiversity and health of the Park. Local residents have observed domestic and feral cats as well as foxes within and around the Park and these species are known for killing native birds, smaller mammals and reptiles. The Red Fox, *Vulpes vulpes*, has been formally recorded in the Park (Nature Glenelg Trust/Landcare Group 2020). Within the Park, the presence of foxes is likely to pose considerable threats to native wildlife (through predation and disease) and increase the spread and growth of weeds as they can disperse weed seeds via scats. It is recommended that Council actively monitor the Park to determine the abundance of domestic cats and foxes and address accordingly.

6.3.3 Monitor and regulate dumping of domestic and council waste, substrates and plant material (3c)

Dumped materials and garden waste can facilitate the spread of weeds and other contaminants into the Park. Improved controls and regulation by Council have decreased the level of dumping in the Park over time; however, this must be regularly monitored by Council to allow for further improvements if needed.

Carparks, vehicle access and walking track infrastructure must be maintained to provide a barrier for unauthorised vehicle access, and waste bins at carparks should be monitored to ensure that the current level of maintenance is adequate. As indicated in the Wadmore Park/Pulyonna Wirra Management Plan 2013 - 2018, communication and support from adjacent residents and park visitors is needed to continually discourage illegal dumping.

6.3.4 Implement and monitor a no-mountain-bikes policy within the Park (3d)

Currently push bike and mountain bike riding is permitted within the Park. Whilst passive bike riding is not a major concern, active use bike riding within the Park more broadly could compromise the ecological, environmental, biodiversity and nature-connection values of the Park. The differentiation of passive bike riding and active use bike riding has been based on the following:

- Passive cycling – requires no specialised infrastructure, does not result in creation of new and undesirable tracks, other passive uses (such as walking and running) can occur in the occupied area at the same time, will not result in environmental modifications, unlikely to impact of other users and resident wildlife.
- Active use cycling – requires the exclusive use of the area occupied and/or impacts on the safety and experience of other park users, requires considerable area/space, likely to result in negative environmental modifications, likely to impact resident wildlife, potential safety issues to the cyclist. Mountain bike riding is an example of active use cycling.

Repeated and intensive cycling along internal tracks could result in soil loss or compaction, damage to track surface, soil displacement, track degradation during wet periods and change the behaviour of native fauna at critical times. There are also safety issues associated with cyclists going at a speed where they are unable to break quickly and/or there is poor visibility (such as approaching corners – of which there are many in the Park). This is duty of care issue to protect cyclists and other visitors.

Feedback from the stakeholders was mixed as some people agreed that bike riding within the Park should be reviewed with a view to disallowing it, and others believed it was a relatively passive activity that should be allowed. While undertaking field surveys, there was evidence of bike tracks that deviated from the designated tracks into areas that supported native vegetation. These were most likely created by mountain-bike use, Ensuring a consistent approach within the park is important to minimise confusion and facilitate clear communication. It is noted that cycling per se is an important recreational activity when it occurs in a suitable setting therefore bike riding should be continued however mountain bike riding within the Park is prohibited .

6.3.5 Review the current Park zoning and build a case for rezoning as a biodiversity reserve (3e)

As a highly significant biodiversity asset, Council should consider what opportunities there are to formally protect the Park in perpetuity for future generations. Protection mechanisms can also assist Council and the Landcare Group to secure funding for critical work. Options include:

- A Heritage Agreement
- Recognise the biodiversity and threatened species values by renaming the Park to *Wadmore Park/Pulyonna Wirra Biodiversity Park*
- Currently identified as Metropolitan Open Space under Councils Open Space Strategy, consider creating a new zone (conservation or biodiversity) that sets this park aside from others within the region
- Investigate what opportunities there are for rezoning the park from Residential to Open Space under the Development Plan.

At the time of writing this plan, there is currently funding available for existing or aspiring Heritage Agreement Owners under the Revitalising Private Conservation in South Australia Program - [click here](#). Putting the Park under a Heritage Agreement is strongly recommended.

6.4 Address and implement climate change resilience management and restoration approaches

6.4.1 Propagate and plant out locally extinct or declining plant species and avoid plantings that require considerable water (4a)

The Landcare Group are currently growing and planting species that are presumed extinct, declining, or no longer demonstrating natural regeneration. This provides insurance populations of these species if they are not naturally able to persist because of undesirable climate change shifts. To further maximise likelihood of persistence, it is recommended that the species be planted in different areas. Potential plant species that Council could consider including in planting programs include:

- *Acaena novae-zelandiae* – this species is considered locally extinct in the Park by Brewer (2005)
- *Banksia marginata* – this species is considered locally extinct in the Park by Brewer (2005)
- *Spyridium parviflorum* – this species is considered locally extinct in the Park by Brewer (2005)
- *Santalum acuminatum* – limited within the Park and demonstrating poor health. There is evidence of some recruitment however it is limited, and juveniles are being snapped in half. In 2005 (Brewer, K) estimated that there were over 1,000 plants. This could be reviewed as the authors of this Plan think the number is considerably lower (possibly <100) however this was not explicitly assessed.
- *Hakea carinata* – this plant species was demonstrating dieback within the Park in areas where the other vegetation appeared healthy. Although this plant does not have a conservation rating, if it is declining, seed collection from Black Hill and subsequent propagation and planting would be beneficial.
- *Prostanthera behriana* – there are currently only 10-20 plants remaining in the Park (Sproule 2020).

Council could also consider developing a seed collection and propagation strategy. The strategy should be carefully planned with priority species identified, seed collection and propagation documented (H Haavisto, 2020 pers.comm.), and plantings mapped (ideally GPS coordinates will also be collected). The work would include (H Haavisto, 2020 pers.comm.):

- Collecting and establishing a seed collection of flora species that are only found in the Park
- Propagating these plant species and reintroducing them into priority reserves to increase flora diversity for the future

An additional consideration could be selecting plant species that are known to require and use minimal water and limiting species that require considerable water uptake and/or have deep draw down. For example, *Eucalypt* trees are predicted to extract more water from the soil when compared to small shrubs and native grasses. In contrast native grasses and tussock type plants (such as *Lomandra*, *Dianella* and *Lepidosperma* species) are adapted to drier conditions and use less water. These plants also have the added benefit of mitigating against evapotranspiration loss because of their ground surface coverage.

6.4.2 Provide habitat or novel habitats for fauna species that will be impacted by climate change (4b)

South Australian climate is becoming hotter and drier with unpredictable and more frequent weather events such as storms, bushfires, and heatwaves, this will impact on fauna species. The effects on fauna will likely be increased stress, reduced or changed food supply, increased exposure to predation, poor habitat quality and impacts on breeding and dispersal. Climate shifts might result in fauna species dispersing into the Park from other areas (such as BHCP).

In consideration of this, the habitat needs of existing and surrounding Fauna should be identified and if required, novel habitats constructed. This recommendation will be further informed by the Fauna Survey work being undertaken by NGT/Landcare Group and assist with identifying habitat restoration priorities. Some suggestions include:

- Increasing Bibron's Toadlet habitat by providing clumps of logs, bark, litter and grassy-debris within damp areas. Additional consideration should be given to the timing of when the silt trap is dredged as frogs are known to hibernate adjacent to these (M Ó Conaill 2020 pers.comm.).
- Continue with habitat creation for small reptiles (currently doing this with roof tiles)
- Build small structures of leaf litter and fallen logs for small mammals (e.g. Yellow-footed antechinus, located in Black Hill CP). A similar approach has been undertaken by the University of Adelaide, Upper Sturt Landcare Group and DEW in constructing bandicoot habitat (Bandicoot Bungalows [Click here](#))
- Ongoing monitoring of nest boxes and provision of additional ones/types as the need is identified.

There is also a resident Koala population that is highly valued by the community and local residents. In times of drought and excessive heat, people within the community refill water buckets underneath mature trees (particularly along the eastern side of the Park). This has created additional tracks within the Park and it is suggested that an additional Koala watering station is provided in this part of the Park to ameliorate against these impacts.

6.4.3 Ensure representative C4 grasses and drought tolerant species are included in restoration (4c)

The species that are more likely to persist and/or benefit from climate change are those that can adapt to or tolerate change, persist at a rate that is commensurate with climatic changes and have widespread distribution. Native C4 grasses are expected to thrive with increased temperature and they should be protected within the Park and continue to be included in revegetation work (as has been done by the Landcare group).

These grasses have a low-fuel load during hotter periods as they are summer-active. They also provide other climate change benefits as they reduce deep drainage to water table and mitigate against impacts of erosion and soil desiccation (Native Grasses Resource Group). Some of the C4 plant groups include the species belonging to *Aristida*, *Chloris*, *Bothriochloa*, *Enneapogon* and *Themeda*.

Council have committed to using native grasses and drought tolerant plantings to address climate change under its Open Space Strategy.

6.4.4 Include mixed provenance within the Park (4d)

Using a climate change modelling tool, the predicted change by 2030 within the greater Adelaide region is +0.9 degrees Celsius and -6% rainfall. This tool provides analogues explorer that matched the predicted climate “state” to other major towns within Australia ([click here](#)). Using the explorer, the towns that match the predicted climate of the Park in 2030 were Ravensthorpe, Gawler, Keith, Pingelly, Clare, Corowa, Narrandera, Echuca, Wagga Wagga and Kyabram. Identifying these towns and the vegetation communities and plant species that occur here can assist with provenance selection.

Different or mixed provenance will increase the likelihood of plant populations surviving within the Park as they are better adapted to different climates and more genetically robust. There are a range of provenance selection strategies that could ensure revegetation efforts are resilient to the impacts of climate change. Ideally, propagules or seeds will be collected from an area that represents a climate zone similar to what the Park will have in the future.

Options include:

- Local composites: Introduce seed or propagules from non-local areas that occur in a different type of landscape.
- Predictive: Source seed or propagule exclusively from areas that have similar weather conditions that will match the likely climate of the Park in the future
- Climate adjusted mix: This requires mixing provenance from other climate zones with local (in Park) provenance. The external provenance could be from one site or along a climate gradient.

If the preferred option is composite or mixing, then an acceptable threshold can be set by Council and the Landcare Group (e.g. 10% seeds are collected elsewhere). It is recommended that the ratio is initially *low-externally sourced* : *high-local sourced*.

Value-add recommendation

6.4.5 Develop a climate change restoration decision making framework (4e)

Because of the uncertainty with climate change it is critical that climate-ready restoration decisions consider:

- Will it enhance resilience?
- Will the work have an adaptive capacity?
- Will the implementation be effective under a range of possible climate scenarios?
- Will the work result in multiple benefits?
- Will the implementation have a low-or-no regret?
- Is the work flexible and adaptable?

These considerations can be assessed in context of the best-case scenario and the worst case scenario (e.g. using a climate projection tool such as Climate Projections for Australia, [click here](#))

6.4.6 Scenario analysis for objective and recommendations

Scenario	Predicted result of each scenario
Do-nothing	<ul style="list-style-type: none"> - Ongoing decline of significant and threatened flora species - Undesirable shift in vegetation communities (dominated by competitive and long-lived species) - Dieback and/or thinning out of species intolerant to climate change (plus opening up gaps to other species) - Territorialisation of the wetter areas of the Park - Reduced regeneration and overall declining health of vegetation - Reduced amenity value because of landscape homogenisation - Dieback and falling limbs of large trees (during storms and heat waves) - Wildlife decline (or deaths) during heatwaves (if no areas to shelter and hydrate) - Homogenous vegetation community - Increased fuel risk (particularly introduced plants that die off during summer) - Habitat competition between fauna species (particularly if moving out of Black Hill into Wadmore) - Increase abundance and range of <i>Acacia paradoxa</i> - Potential increased fuel loads within the Park (exposing visitors and local residents to fire risks) - Increase in weeds, particularly c4 grasses - Loss of species endemic to the council region - Flooding events and increased erosion (and loss of topsoil)
Prepare and plan	<ul style="list-style-type: none"> - Ongoing decline as outline in the “do-nothing” scenario - Strategic and well planned out approach - Potentially increased knowledge pool - Potentially greater partnerships
Implement	<ul style="list-style-type: none"> - Presence and regeneration of vegetation species that will persist - Vegetation shifts are deliberate and desirable - New plantings and regrowth that equal dieback and deterioration - Amenity value is maintained - Evidence of falling limbs is addressed and strategically used for fauna habitat - Wildlife provided with alternative habitat - Heterogenous vegetation communities - Fuel risk and fuel loads is within “reasonable” levels - Plantings are robust, healthy and reproductively viable - Increase in native grasses that outcompete weed species - Endemic species are represented within the Park

6.5 Identify and address existing, potential and perceived fire risk to habitat, flora, fauna, residents and visitors

6.5.1 Develop and implement community engagement strategies that address real and perceived fire risks of the Park (5a)

There is often community anxiety and concern over bushfire risk, particularly in context of our drying climate and reduced rainfall. Concern by residents is understandable, particularly for those that effectively form an island between Black Hill CP and Wadmore CP. There is sometimes confusion about what comprises a fire risk as native vegetation is always assumed to be a significant bushfire threat while garden and building structures are assumed safe. This is not always the case.

Stakeholder feedback was that some garden vegetation along the eastern fire track posed as much, if not more, fire risk than the *Eucalyptus* trees within the Park.

It is recommended that a workshop be convened that involves fire experts, Council, stakeholders, residents and fire control practitioners. The workshop would identify perceived fire risks of the Park and fire experts and fire management authorities would have an opportunity to address these. Council should aim to regularly (every 2.5 years) provide these awareness and engagement opportunities, or in response to strong community demand. These responses could be documented and merged into a myth buster type of fact sheet that clearly differentiates between actual and perceived risk. To reinforce the outcomes from the workshop, a street corner meeting could be arranged (e.g. along the eastern fire track) with Council and fire expertise representation.

Recommendation 6.1.2 proposes developing and disseminating a fact sheet on ecological burns and this will further strengthen communities understanding about fire ecology and dynamics. However, it is important that any information provided by Council on bushfire prevention and preparedness is clearly differentiated from the ecological burning fact sheet, and vice-versa.

6.5.2 Ongoing review and maintenance of fire risks within Park and along fire tracks (5b)

The Council has an obligation to identify and reduce fire risk under the Fire and Emergency Services Act 2005. This includes maintaining tracks for emergency services access and egress. If a fire was ignited within the Park, the first response would be provided by the CFS and the secondary response by MFS and possibly DEW Fire. As such, Council should continue to liaise with both fire safety authorities and DEW Fire to ensure that Council is complying with required maintenance and that the tracks provide sufficient access and egress for firefighting equipment and the safety of fire fighters. This should occur prior to the commencement of each Fire Danger Season.

The Park is located within the Mount Lofty Ranges Bushfire Management area. The bushfire risk assessments and mitigation should be consistent with those detailed within the Mount Lofty Ranges Bushfire Management Area Plan. As owners of the Park, the Council must take responsible steps to:

- Prevent or inhibit the outbreak of fire on the land; and
- Prevent or inhibit the spread of fire through the land; and
- Protect property on the land from fire; and
- Minimise the threat to human life from fire on the land.

To ensure that community is observing and undertaking bushfire prevention, Councils Fire Prevention Officers are required to assess bushfire hazards within the area and provide advice to property owners to mitigate against these risks. Foxfield Estate that neighbours the east and north

of the Park is considered a very high fire risk due to its proximity to BHCP. The obligations under this rating includes (Source: Bushfire Management Area Plan):

- Property owners are legally required to prepare their properties
- Bushfire prevention activities to be identified and undertaken by Council
- Council must provide firebreaks and fire access tracks
- The CFS and Council must provide community engagement and education (on bushfire risk)

Specific recommendations for reviewing and mitigating fire risks within and surround the Park include:

- Continue to monitor and manage fuel loads in areas in connecting Council land such as Hakea Drainage Reserve, Melalueca Drive and Quandong Avenue Drainage Reserve. These areas should also be monitored to ensure that flammable garden plants do not germinate and persist.
- Built structures located along the Parks boundary, such as brush and timber fencing and retaining walls, have been identified as a fire risk as they readily ignite and support the spread of fire (Golder Associates 2010; I Tanner 2020 pers. comm). Council could consider cost-sharing the replacement of these fences. At a minimum, Council should continue to monitor and communicate these fire risks to residents.
- The extension of flammable garden plants into the Park and along Hakea Avenue and Melaleuca drive should be removed by Council. This should be planned and communicated to affected residents, so they understand why the removal is occurring. The introduced *Acacia iteaphylla* occurs along the eastern fire track and it has been identified as posing a significant fire risk (in addition to potentially spreading into the Park). It is recommended that removal of this tree is discussed and actioned with the affected resident.
- Advice provided by DEW Fire and the CFS suggested an Asset Protection Zone could be established along the eastern boundary of the Park to reduce fire risk to residents and property. This risk was also identified in the Wadmore Park – Pulyonna Wirra and Drainage Reserves Fire Management Plan 2010. This will require the targeted removal of highly flammable and senescing plant individuals, specifically *Acacia paradoxa*. It is recommended that any removal of these be strategically planned, mapped and documented with the following considerations:
 - Council would develop a Park Asset Protection Zone strategy that is shared with key stakeholders such as the Landcare Group
 - GPS coordinates should record the plants that are to be pruned or removed and represented on a map that will be available within the strategy. The map could be overlayed with the vegetation community, revegetation opportunities (species that are less of a fire risk) and weed issues. This map should be provided to the Landcare Group and other ecologists so they can provide input on any sensitive or highly significant biodiversity risks.
 - The Asset Protection Zone strategy should provide results from a fuel hazard assessment (see point below)
 - Follow up weed control will likely be required and funding should be allocated accordingly.
- Removal of *A.paradoxa* should utilise a bushcare and minimal impact approach to ensure that there are no off-target impacts. This includes trampling on threatened species, treading on vegetation recruitment, spreading weed seeds and implementation of *Phytophthora* hygiene practices. Any pruning, harvesting or removal needs to be undertaken using

handheld apparatus (eg brush cutters) to avoid impacts to surrounding vegetation. As with all other intervention work, machinery and equipment hygiene is critical.

- Council should consider engaging a consultant to train their staff in fuel hazard assessment [click here](#). The Landcare group and other stakeholders could also be invited to participate in the training.
- The use of any materials within the Park such as benches, track surfaces and signage should have low flammability.

It should be noted that ecological burns within the Park will further reduce potential fuel loads by consuming ground level litter and above-ground biomass.



The pictures below are the location of the proposed Asset Protection Zone (source: Rachael Hamilton 2020 Campbelltown City Council)





6.5.3 Ongoing communication with community about addressing fire risk (5c)

Fire prevention and preparedness of fires is a shared responsibility of Council, residents/ratepayers and visitors. Ongoing communication and education of the community about the Park values should also consider increase awareness around perceived and actual threats from fire, particularly for those adjacent to the Park. This should include information about what households can do directly around their homes.

Although Council has an obligation to identify and address fire risk on Council land, it is also the responsibility of rate payers and residents to similarly mitigate against potential fire threats. Councils

Fire Prevention Officers should continue to liaise with residents and inspect properties to ensure that owners are maintaining their property and gardens to reduce fire risk.

Council could further reinforce bushfire risk messaging, particularly on high fire danger days, by utilising social media platforms and/or working with other groups that have an extensive social reach.

Council could also consider presenting its webpage content on bushfires, extreme weather events (heat waves, storms) differently as it is currently nested within the Environment tab. An online differentiation will aid the community and residents to better differentiate between ecological burns and fire prevention operations.

The CFS have community engagement officers that can be approached for additional information and support (P Stribley 2020, pers.comm.).

6.5.5 Scenario analysis for objective and recommendations

Scenario	Predicted result of each scenario
Do-nothing	<ul style="list-style-type: none"> - Community and resident uncertainty and/or anxiety about fire risk - Residents not appropriately prepared - Community and resident concern about impacts from ecological burns (e.g. ember attack, smoke inhalation, wildlife affects) - Community uncertainty about the differences between fuel reduction burns, ecological burns and cultural burns - Emerging or new fire risks are not appropriately managed - Reputational and compliance risk to Council
Prepare and plan	<ul style="list-style-type: none"> - All of the above
Implementation	<ul style="list-style-type: none"> - Community and residents are aware of fire risks and have managed appropriately - Community and residents understand and appreciate the different purposes of fuel reduction burns, ecological burns and cultural burns - Emerging fire risks on Park are identified and managed by Council - Community and residents are able to prepare and take responsibility - Council complies with its obligations

6.6 Maintain and improve infrastructures that protects park and ensures visitor safety

6.6.1 Improve walking tracks to mitigate against off-track impacts and ensure visitor safety (6a)

Walking tracks must be maintained to a standard that minimises erosion from water run-off, improving both the safety of visitors and the integrity of adjacent biodiversity assets. This may be achieved with soft solutions such as stabilising soil using revegetation of appropriate plant species, or engineered solutions using materials that blend with the surroundings and will not risk importing contaminants.

Rationalisation of walking tracks within the Park has been attempted several times with varying degrees of success. There is a risk that by blocking one minor trail a new one will be formed. The reason for the presence of a track should be considered when planning to reduce the number of

minor trails. This often includes habitual movement or idleness, therefore public awareness may be needed in conjunction with minor trail closures. Where idleness may be the cause (for example cutting across a corner at a track intersection), the closure of a track must ensure that less effort is needed to access an appropriate walking track. Again, materials used to block track should blend with the surroundings and be free of any pathogens or other contaminants that might leach into substrate and waterways.

The east-west fire track within the Park is part of the Adelaide 100 trail and should be reasonably maintained to allow for high visitor usage, in addition to complying with fire track specifications.

See Appendix 1 for the locations of proposed track decommissioning.

6.6.2 Improve the vegetation plantings within swales to prevent the spread of weed species (6b)

Although the bioswales have been effective in mitigating against impacts of erosion (see Section 6.6.3), the survival of the plant species within the swale has been less successful. The loss of vegetation within the bioswales will reduce the effectiveness of pollutant uptake. The exposed substrate of the swale is also resulting in germination of weed species and there is concern by stakeholders that this will impact on the integrity of the Park. Such weed species, particularly annual grasses that die off during summer, could also present fire risk to property and the Park.

In contrast, replanting of low flammable vegetation within the swales using a mix of species that will survive in either wet or dry conditions could ensure that the swales are vegetated at all times of the year, without increasing fire risk. Ideally the plant species will be able to tolerate both wet and dry conditions however this may not be possible. Dense and diverse plantings within the swale is likely to provide habitat for invertebrates.

It is recommended that Council plan to replant the swale and undertake weed control as required to prevent seeds being transported into the Park. The suite of species selected should be communicated to local residents either as a fact sheet, brochure or on Council's website to eliminate concern about flammability and fire hazards. Some potential plant groups include:

- *Lomandra* species
- *Juncus* species
- *Carex* species (eg *Carex tereticaulis*)
- *Goodenia* species
- *Baumea juncea*
- *Epilobium* species (eg *Epilobium hirtigerum*)
- *Cyperus* species (eg *Cyperus vaginatus*)
- *Einadia nutans*

6.6.3 Maintain flood and hydrological structures (e.g. swales) to prevent Park erosion issues (6c)

The construction of the bio swales along the eastern fire track has been successful in intercepting and removing water flow and run off from residences to stop it entering the Park. The structures should be regularly monitored (e.g. at least annually) to ensure that they are not accumulating sediments, litter and debris. They should also be assessed during heavy rainfall periods to evaluate their ongoing effectiveness. If possible, water that enters the swales and within Park should be monitored after storms, heavy rains or flooding events.

6.6.4 Scenario analysis for objective and management recommendations

Scenario	Predicted result of each scenario
Do-nothing	<ul style="list-style-type: none"> - Existing swales house weed species or garden species and the seed bank enters the Park. - Emerging erosion, flooding or contamination issues are not documented, and Council is unaware of the resulting affects - Potential injuries to visitors and residents - New tracks are created in Park resulting in soil disturbance, weed invasion and vegetation compaction - Negative visual impact of non-vegetated or weedy swales along the eastern boundary - Erosion with Park and loss of topsoil into waterways or other parts of the Park
Prepare and Plan	<ul style="list-style-type: none"> - Existing swales house weed species or garden species and the seed bank enters the Park. - Council can budget in advance for work required after 2026 - Documented issues with erosion, flooding or contamination can be addressed by council after 2026
Commence work between 2021 and 2026	<ul style="list-style-type: none"> - Visitors and residents can safely visit the Park - No track run off into other areas of the Park - None or limited off-track impacts (and recovering areas previously impacted) - Erosion into the Park is controlled - Water quality and quantity is improved within Park - Increased amenity value along the eastern fire track - Increased habitat for invertebrates along the eastern fire track - Reduced weed species within the swales - Opportunity for interpretative trail along the eastern fire track

6.7 Conserve the cultural values of the Park

6.7.1 Develop a cultural burn procedural/best-practice document in partnership with Kurna representatives (7a)

It is critical that steps are taken to understand and respect Kurna cultural procedures and practices. One option for ensuring that Council and other stakeholders engage with and develop partnerships with Kurna people is to seek advice on cultural procedures. This information would ensure that appropriate communication and processes are followed that will result in effective partnerships to plan, propose, and implement cultural burn/s.

The cultural procedure and guidelines could also incorporate Kurna language which could be included in the proposal for cultural burns. As council has a Reconciliation Advisory Committee, advice could also be sought from this group.

As there is a deep spiritual relationship between Traditional Owners and country, Council could consider working with Kaurna Elders and community to GPS the major remnant trees (suggested by Ivan-Tiwu Copley 2020).

6.7.2 Ongoing monitoring and reporting on the condition of the heritage assets within the Park (7b)

Regular monitoring of signage and the remaining heritage assets should be programmed into regular monthly tasks and aim to quickly identify and respond to vandalism if this occurs. Council should continue to work closely with the Campbelltown Historical Society to ensure protection of heritage artifacts such as military hospital remnants and garden rockery remnants, and the previous location of the Athelstone-Torrens Valley Rifle Range .

6.7.3 Scenario analysis for objective and management recommendations

Scenario	Predicted result of each scenario
Do-nothing	<ul style="list-style-type: none"> - Inability to trial cultural burns - Reputational risks - Concern by residents about condition of heritage assets - Opportunity loss of learning from traditional owners about how to manage country - Potential degradation and/or vandalism of heritage assets
Prepare and plan	<ul style="list-style-type: none"> - Potential degradation and/or vandalism of heritage assets - Inability to trial cultural burns - Loss of momentum and motivation
Implementation	<ul style="list-style-type: none"> - Ability to trial a cultural burn and learn from the experience - Opportunity to understand and learn about traditional management of country - Ability to set up a register of heritage assets and monitor the condition regularly - On Park heritage assets are protected and appreciated by visitors and residents - Opportunity to showcase a Park managed for both biodiversity and cultural significance

6.8 Monitor and communicate trends, challenges and concerns between stakeholders and adapt management accordingly

6.8.1 Convene a Park Stakeholder Group that represents all stakeholders and develop an integrated riparian restoration proposal (8a)

There are many stakeholders that have a management interest in the Park either directly or indirectly. As the Park connects to Black Hill Conservation Park and supports a section of Fifth Creek there is an opportunity to work with stakeholders of these areas to manage the Park using an integrated ecosystem and landscape approach. This could include DEW Parks, Friends of Black Hill and Morialta, St Ignatius School and other groups involved with Fifth Creek Landcare.

As a starting point, the group could explore the need for a riparian restoration plan that includes all sections of the Fifth Creek and the other tributaries that flow into the eastern section of the Park from Black Hill. There has not been an assessment of the condition of Fifth Creek since 2012 and as

this was 2km upstream the water quality within the Park is likely to be different. An assessment of the riparian health within the Park should be prioritised to evaluate the current state, invertebrate presence, water quality and flow and pollutant levels. This could be done in partnership with the stakeholders outlined (e.g. a school project).

The existing Fifth Creek Survey and Management Plan can be used to provide guidance on priority stream restoration actions (Miles 2017). The Wadmore Biodiversity Assessment (Duffield and Jeffery 2020) identified 22 weed species present within the riparian zone with differing threat ratings (based on cover and invasiveness).

6.8.2 Ongoing monitoring of the biodiversity assessment quadrats and share results (8b)

To monitor changes in vegetation condition, four biodiversity assessment quadrats were established in October 2020. The assessments, using the NVC Bushland Assessment Manual (2020) and Bushland Assessment Scoresheet (2020), allow for rapid biodiversity condition assessments and evaluations and it is recommended that these be undertaken by CCC biodiversity staff at a similar time annually.

Results should be shared with key stakeholders such as the Campbelltown Landcare Group to adapt actions where needed. Over time it is expected that changes in attributes such as species richness, recruitment, weed abundance and cover, and habitat value will be detected which will inform the relative success of management actions and allocated resources within the park.

6.8.3 Use the priority matrix to review and rank key activities and investments (8c)

As there are many recommendations within this Plan that support the management objectives and desirable outcomes, and not all of these can be implemented immediately, a matrix can be utilised to identify priority work. An example of how this can be approached is provided in Section 7.2. It is suggested that Council and the Landcare Group work together to identify and agree on priorities by using the matrix or other the criteria provided in Section 7.2.

Value-add recommendations

6.8.4 Develop a Monitoring, Evaluation, Reporting and Improvement framework or plan (8d)

A Monitoring, Evaluation, Reporting and Improvement (MERI) Framework will provide a system for monitoring, evaluating, and reporting on the achievement towards delivering key work. It provides a methodology for reviewing the progress towards delivering outputs and achieving outcomes. It is suggested that the MERI Framework be developed within 12-months of implementation the Management Plan, if not earlier. Guidance on a developing a framework has been provided along with a conceptual diagram that illustrates each of these MERI components and how they are interrelated – See Section 7.

6.8.5 Organise and host a Wadmore Park Field day with other Landcare groups to share learnings (8e)

Cross-collaboration between Landcare, conservation groups and individuals will continue to be important for communicating challenges, showcasing success and building capacity of the sector in general to deliver positive on-ground change.

If some of this novel restoration work is undertaken, demonstrating the work that was undertaken and the result from this work will assist other Landcare groups to deliver similar types of approaches. It is suggested that this field day occur towards the end of the lifespan of this Plan and before the development of the next management plan.

6.8.6 Scenario analysis for objective and management recommendations

Scenario	Predicted result of each scenario
Do-nothing	<ul style="list-style-type: none">- Stakeholders and Council work in silos and duplication of effort- Potential loss of commitment and motivation- Key work areas and priorities are not identified and/or addressed- Individual and group knowledge and experience is not shared (thus others don't benefit)- Adaptive management and improvements are not implemented- Reputational risks to all stakeholders- Reduced cost-effective implementation- Risks and threats to biodiversity are not identified and therefore not managed- Work programs are overambitious, and delivery is compromised- Unsuccessful or inefficient work continues without adjustments that puts a strain on investment and resources
Prepare and plan	<ul style="list-style-type: none">- Key stakeholders and Council remain enthusiastic and committed- Key work areas and priorities are not identified and/or addressed- Individual and group knowledge and experience is not shared (thus others don't benefit)- Reduced cost-effective implementation- Risks and threats to biodiversity are not identified and therefore not managed- Work programs are overambitious, and delivery is compromised
Implementation	<ul style="list-style-type: none">- A fully inclusive decision-making group meets regularly and shares information- Effective communication results in complementarity of work and shared purpose- Motivated and inspired Council and stakeholders- Priority work is identified and implemented- Work is reviewed and evaluated, and improvements made at the right time- Key work on Park is prioritised and efficiently delivered- Cross-collaboration between the Landcare and biodiversity sector- The condition and trends of the biodiversity within Park is monitored and results shared between stakeholders

Table 10: Management objectives, recommendations, and complementarity

Objective	Option code	Recommendation/Option description	Complementarity with other objectives/recommendations
1. Trial ecological and/or cultural burns for biodiversity outcomes	1a	Convene a steering group to co-develop a burn on Park proposal	1b, 1c, 1d, 1e, 2c, 2d, 3e, 5a, 5b, 5d, 7a, 7b, 7c, 3a
	1b	Develop a user-friendly fact sheet on ecological and cultural burns	1c, 1d, 1f, 5a, 5b, 5d
	1c	Implement a trial ecological burn in the priority area	1a, 1d, 1e, 1f, 2, 4b, 5a, 5d, 3e, 3a
	1d	Work with Kaurna to trial a cultural burn in the grassy woodland area	1b, 1c, 2, 4b, 5a, 5d, 3e, 2b, 2d, 2c,
	1e	Conduct soil seedbank trials within the proposed burn areas	2d, 2f, 4a, 4e, 7a
	1f	Organise a field day to view the results from other ecological burns	1c, 5a, 5d, 7a
2. Improve the vegetation state and trajectory in the Park by removing undesirable abundant or risk species	2a	Trial the manual removal of <i>Acacia paradoxa</i> in priority heathland areas, monitor invasion fronts and implement supplementary plantings	1c, 1e, 2b, 3e, 4a, 4b, 4c,
	2b	Trial intervention approaches to enhance and restore native grasses	3e, 4a, 4c, 7a, 7b, 1d, 1e, 3e, 4a, 4c, 7a, 7b
	2c	Trial slashing in the grassy woodland area	3e, 4a, 4c, 7a, 7b, 1d, 1e, 3e, 4a, 4c, 7a, 7b
	2d	Weed management of priority weed species	1, 1e, 1f, 5a, 5b, 5d, 7a, 7b
	2e	Record any suspected dieback and collect soil samples for PC testing	1, 2, 7a
	2f	Trial soil inoculation in priority areas	1, 4a, 4b, 4e, 7a, 7b

3. Control and mitigate against adverse visitor impacts and support environmentally compatible visitation	3a	Close off identified walking tracks in areas of high vegetation value	1, 2, 1a, 1c, 1d, 1f, 2e
	3b	Implement and support community to transition to a dogs-on-leash policy	1, 2, 4, 6a, 1c, 4a
	3c	Monitor and regulate dumping of domestic and council waste, substrates and plant material	All
	3d	Implement and monitor a no-mountain-bikes policy with the Park	1, 2, 4, 6a, 1c, 4a
	3e	Review the current Park zoning and build a case for rezoning as a biodiversity reserve	All
4. Address and implement climate change resilience restoration and management approaches and strategies	4a	Propagate and plant out locally extinct and/or species declining or demonstrating reduced health and avoid plantings that require considerable water	1e, 2d, 2f,
	4b	Protect habitat or provide novel habitat for fauna species that will be impacted by climate change	1c, 1f, 2a,
	4c	Ensure representative C4 grasses and drought tolerant species	1d, 2b, 2c, 2d
	4d	Include mixed provenance within the Park (eg 10%)	1, 2, 1c, 1d, 4b
	4e	Consider insurance plantings within the Park	1, 2, 1c, 1d, 4b
5. Identify and address existing, potential and/or perceived fire risk to habitat, flora, fauna, residents and visitors	5a	Develop and implement community engagement strategies that addresses real and perceived fire risks of the Park	1b,1d, 2a,
	5c	Ongoing review and maintenance of the fire tracks	2a, 5a, 5b
	5d	Ongoing communication with property owners to identify and address fire risk	1b, 1d,1f, 2d,
6. Maintain and improve infrastructures that protect the integrity of the park	6a	Improve walking tracks to mitigate against off-track impacts and ensure visitor safety	1, 1c, 2d, 3a
	6b	Improve the vegetation plantings within swales to prevent spread of weed species	1, 2, 2d, 4d
	6c	Maintain engineering structures (e.g. swales) to prevent erosion	All

7. Conserve the Parks cultural and historical values	7a	Develop a cultural burn procedural/best-practice document in partnership with Kaurua representatives	1a, 1c, 1d
	7b	Ongoing monitoring and reporting on the condition of the heritage assets within the Park	
8. Monitor, evaluate and share information on trends, changes and risks and adapt management approach accordingly	8a	Convene a Wadmore Park Stakeholder Group that represents all stakeholders and meet twice/year	1a,
	8b	Ongoing monitoring of the biodiversity assessment quadrats and share results	1c, 1d, 1f, 2d
	8c	Organise and host a Wadmore Park Field day with other Landcare groups to share learnings	1a, 1b, 1c, 1d, 1f, 2c, 2d, 2e
	8d	Use the priority matrix to rank key activities and investments	All
	8e	Develop a Monitoring, Evaluation and Reporting framework	All

7 DECISION MAKING

7.1 Risk assessment of recommendations

A risk assessment of each recommendation has been undertaken to complement the discussion in section 6 and the scenario analyses for each of the objectives. This has been done in context of implementing the suggested recommendations or not implementing them. Any type of management comes with risks and it is good process to identify these so decision makers and practitioners can consider mitigation approaches. It is also important to add that high risk actions often have a high return (in terms of outcomes) and should not be discarded just because of their “risk score”. As an example, trialling an ecological burn has an average risk score of 7.8 however with a carefully thought-out proposal (as discussed in section 6.1.1) these risks could be addressed.

The assessment considered all potential risks associated with either implementing the recommendation as outlined in section 6 or not implementing the work. The likelihood of these risks and the consequences were scored (between 1 and 5) based on descriptive rankings and then averaged to provide an overall risk score for the delivery or inaction of each recommendation.

The likelihood is the probability of the risk occurring under the circumstances provided (in this case it is based on the probability of the risk occurring if a) the management recommendation is implemented or b) it is not implemented. The following rankings and scores were used – Rare (=1), Unlikely (=2), Possible (=3), Likely (=4) and Almost Certain (=5).

The consequence ranks the significance of risk if it occurs and for this risk assessment, it was evaluated in context of the consequences to a) the ecology and biodiversity of the Park and b) people and/or park-users. The following consequence rankings and scores were used – Insignificant (=1), Minor (=2), Moderate (=3), Major (=4) and Catastrophic (=5).

A summary of the results is provided below in Table 11 and the full risk assessment is provided as Appendix 4.

Table 11 - Average risk score for each management recommendation based on a) implementing the risk and b) not addressing the recommendation.

The maximum possible score is 10.

Management recommendations	Average risk score	
	Implementation	Do-nothing
Convene a steering group to co-develop a burn on Park proposal	5.0	8.0
Develop a user-friendly fact sheet on ecological and cultural burns	5.5	7.3
Implement a trial ecological burn in the priority area	7.8	8.7
Work with Kaurua to trial a cultural burn in the grassy woodland area	6.8	8.7
Conduct soil seedbank trials within the proposed burn areas	6.5	7.0
Organise a field day to view the results from other ecological burns	5.5	7.0
Trial the manual removal of <i>A.paradoxa</i> in priority heath areas	7.0	8.7
Trial intervention approaches to restore native grasses	6.6	7.7
Targeted weed management of priority weed species	5.0	7.8
Record any suspected dieback and collect soil samples for PC testing	4.0	7.5
Trial soil inoculation in priority areas	5.0	6.0
Close off identified walking tracks in areas of high vegetation value	4.3	6.8
Implement and support community to transition to a dogs-on-leash policy	7.5	8.3
Monitor and regulate dumping of domestic and council waste, substrates and plant material	4.0	7.0
Implement and monitor a no-mountain-bikes policy with the Park	7.3	8.3
Review the current Park zoning and build a case for rezoning as a biodiversity reserve	6.5	7.5
Propagate and plant out locally extinct and/or species declining or demonstrating reduced health and avoid plantings that require considerable water	7.0	8.0
Protect habitat or provide novel habitat for fauna species that will be impacted by climate change	6.0	7.5
Ensure representative C4 grasses and drought tolerant species	6.0	7.0
Include mixed provenance within the Park (e.g. 10%)	7.0	7.5
Consider insurance plantings within the Park	5.0	7.0
Develop and implement community engagement strategies that addresses real and perceived fire risks of the Park	5.5	8.3
Ongoing review and maintenance of the fire tracks	6.3	7.8

Ongoing communication with property owners to identify and address fire risk	5.0	7.5
Improve walking tracks to mitigate against off-track impacts and ensure visitor safety	5.5	8.5
Improve the vegetation plantings within swales to prevent spread of weed species	5.7	7.3
Maintain engineering structures (e.g. swales) to prevent erosion	5.5	6.7
Develop a cultural burn procedural/best-practice document in partnership with Kaurna representatives	6.7	8.0
Ongoing monitoring and reporting on the condition of the heritage assets within the Park	5.0	5.7
Convene a Wadmore Park Stakeholder Group that represents all stakeholders and meet twice/year	5.5	7.0
Ongoing monitoring of the biodiversity assessment quadrats and share results	4.5	6.3
Organise and host a Wadmore Park Field day with other Landcare groups to share learnings	6.5	7.0
Use the priority matrix to rank key activities and investments	4.0	6.3
Develop a Monitoring, Evaluation and Reporting framework	5.5	6.5

Risk scores – 4 and less = low risk; 4 to 6 = moderate risk; 6 to 8 = high risk; 9-10 = extreme risk

7.2 Prioritisation of management recommendations

The matrix below provides a process for prioritising management recommendations based on how much effort and/or investment is required and what the likely impact will be if the recommendations are implemented and successful. This matrix provides four (4) main options:

1. **Eliminate, postpone or delegate** elsewhere = Requires considerable investment and/or effort and the impact is predicted to be in the low-medium range
2. Implement as a **fill-in activity** = Requires less investment and/or effort but the impact is predicted to be in the low-medium range
3. Implement work **immediately** or as soon as possible = Requires low to medium investment and/or effort however the impact is predicted to be in the medium-high range
4. The work should be **planned and scheduled** = Requires considerable investment and/or effort and the impact is predicted to be in the medium-high range

Other criteria can be used and weighted to complement this matrix such as:

- Implementable – Is the action able to be effectively implemented as intended?
- Affordable – Is the action or target affordable in context of Councils budget and/or the likelihood of getting supplementary funding such as community grants?
- Cost-effective – Does the investment result in effective outcomes?
- Timeframe – Can the recommendation be delivered and evaluated within the 5-year timespan?
- Value-adds – Is the recommendation complementary or adding value to other recommendations?

The matrix should be reviewed annually in context of new priorities or unexpected responses to management actions. An example priority matrix is provided as Figure 7.

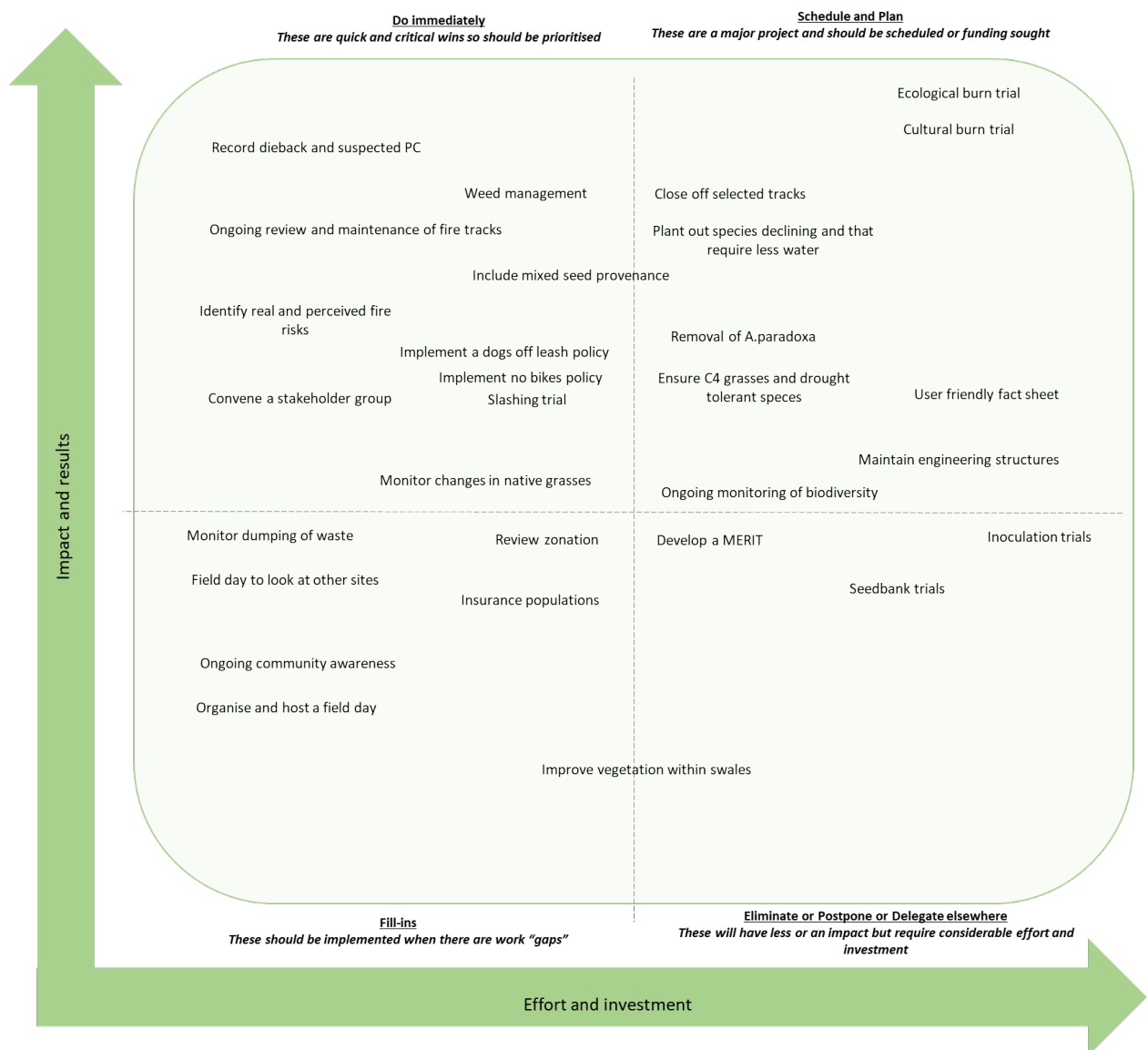


Figure 7: Proposed Prioritisation Matrix

7.3 Monitoring, Evaluation, Reporting and Improvement

There are 5 core key components of this MERI framework and these are briefly discussed below.

1. The Rationale provides the logic behind why the work is required, the expected outcomes and how other elements are interrelated (such as challenges, opportunities, values). This work has been addressed (Section 5).
2. Identify the overarching evaluation criteria that supports the high-level assessment progress towards desirable outcomes and management objectives.
3. The monitoring and data collection component of the MERI Plan should identify what data can be obtained from the activities and deliverables and how it will inform the evaluation. It is also important to agree on who is responsible for the collection, curation and extraction of the data (and any data sharing agreements).

4. The program evaluation is the periodic assessment of what the program has achieved in context of high-level key evaluation questions. It draws on the evidence that will be collected as part of the monitoring stage.
5. Reporting and continuous improvement (adaptive management) is the final stage of MERI as it communicates the results from implementing the Plan and provides a feedback loop so that decision making, and implementation of key activities will result in improved program delivery. The reporting also ensures accountability and transparency to stakeholders.

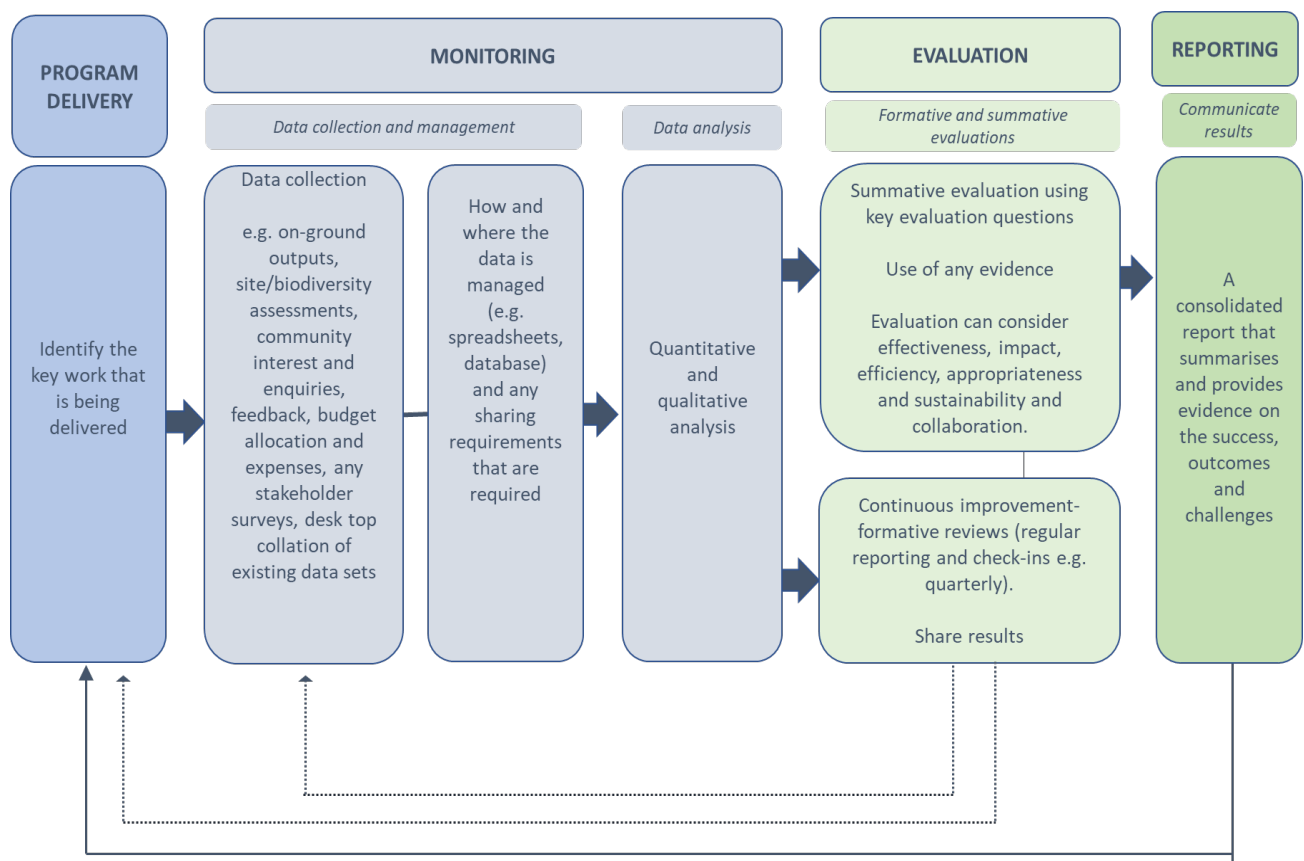


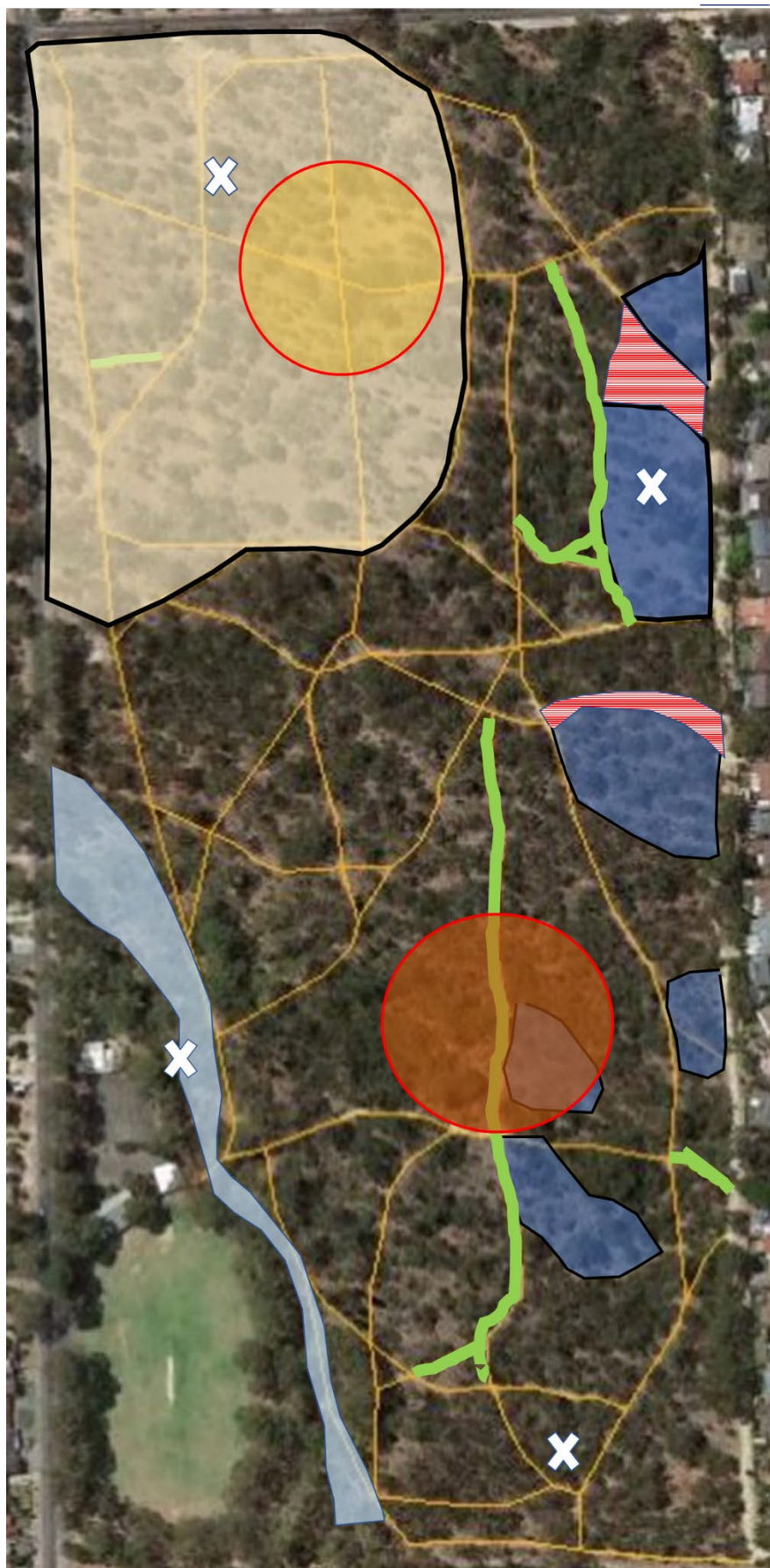
Figure 8: Proposed framework for developing MERI

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Appendix 1

Map of ecological zone management priorities



LEGEND

- Manage for heathland community (plantings and removal of isolated *A.paradoxa*)
- Manage for grassland community
- Potential track closures
- Permanent photo point and monitoring quadrat
- Monitor and manage *A.paradoxa* front
- Preparatory – gain more knowledge and work with other stakeholders on a Riparian Restoration Plan
- Potential ecological restoration trials for grassland improvement
- Potential ecological burn trial for biodiversity and threatened species

Appendix 2

Recorded plant species at Wadmore Park/Pulyonna Wirra

PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Acacia acinacea</i>	Wreath Wattle	Y			Rare		X	X		X
<i>Acacia continua</i>	Thorn Wattle	Y			Uncommon	.	X	X		
<i>Acacia cupularis</i>	Cup Wattle	Y			Rare	.	X	X		X
<i>Acacia iteaphylla</i>	Flinders Range Wattle	N					X			
<i>Acacia myrtifolia</i>	Myrtle Wattle	Y					X	X		X
<i>Acacia paradoxa</i>	Kangaroo Thorn	Y					X	X		X
<i>Acacia pycnantha</i>	Golden Wattle	Y					X	X		X
<i>Acaena echinata</i>	Sheep's Burr	Y					X	X		
<i>Acaena novae-zelandiae</i>	Biddy-biddy	Y				.	X			
<i>Acrotriche serrulata</i>	Cushion Ground-berry	Y				.	X			
<i>Aira</i> sp.	Hair-grass	N								X
<i>Allium triquetrum</i>	Three-cornered Garlic	N					X			X
<i>Allocasuarina muelleriana</i> ssp. <i>muelleriana</i>	Common Oak-bush	Y					X	X		X
<i>Allocasuarina verticillata</i>	Drooping Sheoak	Y					X	X		X
<i>Amphipogon strictus</i>	Spreading Grey-beard Grass	Y					X	X		X
<i>Amyema miquelii</i>	Box Mistletoe	Y					X	X		X
<i>Anthosachne scabra</i>	Native Wheat-grass	Y				.	X		X	X
<i>Aphelia pumilio</i>	Dwarf Aphelia	Y						X		
<i>Arctotheca calendula</i>	Cape Weed	N								X
<i>Aristida behriana</i>	Brush Wire-grass	Y			Uncommon		X		X	X
<i>Arthropodium fimbriatum</i>	Nodding Vanilla-lily	Y					X	X	X	
<i>Arthropodium strictum</i>	Common Vanilla-lily	Y					X	X		X
<i>Asparagus asparagoides</i> f. <i>asparagoides</i>		N					X			X
<i>Astroloma humifusum</i>	Cranberry Heath	Y					X	X		X

<i>Austrostipa blackii</i>	Spear-grass	Y					X		X	
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Austrostipa elegantissima</i>	Feather Spear-grass	Y			Uncommon	.	X			X
<i>Austrostipa flavescens</i>	Coast Spear-grass	Y					X	X		
<i>Austrostipa hemipogon</i>	Half-bears Spear-grass	Y								
<i>Austrostipa mollis</i>	Soft Spear-grass	Y					X	X		X
<i>Austrostipa nodosa</i>	Tall Spear-grass	Y					X	X		
<i>Austrostipa scabra</i> ssp. <i>falcata</i>	Slender Spear-grass	Y					X	X		X
<i>Austrostipa semibarbata</i>	Fibrous Spear-grass	Y					X			
<i>Austrostipa setacea</i>	Corkscrew Spear-grass	Y			Vulnerable	.				X
<i>Austrostipa tenuifolia</i>	Brush Wire-grass	Y	Rare				X	X		
<i>Avena</i> sp.	Oat	N								X
<i>Banksia marginata</i>	Silver Banksia	Y					X			
<i>Baumea juncea</i>	Bare Twig-rush	Y				.	X			X
<i>Bellardia latifolia</i>	Red Bartsia	N					X	X		X
<i>Blennospora drummondii</i>	Dwarf Button-flower	Y					X	X		
<i>Bossiaea prostrata</i>	Creeping Bossiaea	Y					X	X		X
<i>Bothriochloa macra</i>	Red-leg Grass	Y		Rare			X		X	X
<i>Brachyscome perpusilla</i>	Tiny Daisy	Y					X	X		
<i>Brassica</i> sp.		N								X
<i>Briza maxima</i>	Large Quaking-grass	N								X
<i>Bromus alopecuroides</i>	Mediterranean Brome	N								X
<i>Bromus diandrus</i>	Great Brome	N								X
<i>Brunonia australis</i>	Blue Pincushion	Y					X		X	
<i>Bulbine bulbosa</i>	Bulbine-lily	Y					X	X		X
<i>Bulbine semibarbata</i>	Small Leek-lily	Y					X	X		
<i>Burchardia umbellata</i>	Milkmaids	Y					X	X		X

<i>Bursaria spinosa</i> ssp. <i>spinosa</i>	Sweet Bursaria	Y					X	X		X
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Caesia calliantha</i>	Blue Grass-lily	Y					X	X		X
<i>Caladenia reticulata</i>	Veined Spider-orchid	Y			Uncommon	.	X	X		
<i>Caladenia tentaculata</i>	King Spider-orchid	Y					X	X		X
<i>Callistemon sieberi</i>	River Bottlebrush	Y			Uncommon	.				X
<i>Callitris gracilis</i>	Southern Cypress Pine	Y					X	X		X
<i>Calostemma purpureum</i>	Pink Garland-lily	Y					X	X	X	X
<i>Calytrix tetragona</i>	Common Fringe-myrtle	Y					X	X		X
<i>Carex breviculmis</i>	Short-stem Sedge	Y					X	X		X
<i>Carex tereticaulis</i>	Rush Sedge	Y				.	X	X		X
<i>Cassytha pubescens</i>	Downy Dodder-laurel	Y					X	X		X
<i>Cenchrus clandestinus</i>	Kikuyu	N					X			X
<i>Centrolepis aristata</i>	Pointed Centrolepis	Y					X	X		
<i>Centrolepis strigosa</i> ssp. <i>strigosa</i>	Hairy Centrolepis	Y					X	X		X
<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>	Blue Squill	Y					X	X		X
<i>Cheilanthes austrotenuifolia</i>	Annual Rock-fern	Y					X	X		X
<i>Cheilanthes sieberi</i> ssp. <i>sieberi</i>	Narrow Rock-fern	Y			Uncommon	.	X	X		X
<i>Cheiranthra alternifolia</i>	Hand-flower	Y					X			X
<i>Chloris truncata</i>	Windmill Grass	Y					X		X	
<i>Chrysocephalum apiculatum</i>		Y					X		X	X
<i>Clematis microphylla</i>	Old Mans Beard	Y				.	X			
<i>Comesperma calymega</i>	Blue-spike Milkwort	Y				.	X			
<i>Convolvulus erubescens</i>	Australian Bindweed	Y					X			
<i>Convolvulus remotus</i>	Grassy Bindweed	Y					X	X		X
<i>Crassula colorata</i> var. <i>acuminata</i>	Dense Crassula	Y					X	X		

<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula	Y					X	X		X
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Crassula colligata</i>		Y								X
<i>Cryptandra tomentosa</i>	Heath Cryptandra	Y								X
<i>Cullen australasicum</i>	Tall Scurf Pea	Y								X
<i>Cyanicula deformis</i>	Bluebeard Orchid	Y					X			
<i>Cymbopogon obtectus</i>	Silky-head Lemon-grass	Y			Rare	·	X	X		
<i>Cynodon dactylon</i>	Couch-grass	N					X			
<i>Cynoglossum suaveolens</i>	Sweet Hounds-tongue	Y			Uncommon	·	X			
<i>Cyperus tenellus</i>	Tiny Flat-sedge	Y					X			
<i>Cyperus vaginatus</i>	Stiff Flat-sedge	Y					X			X
<i>Cytisus scoparius</i>	English Broom	N								X
<i>Daucus glochidiatus</i>	Native Carrot	Y					X	X		
<i>Daviesia brevifolia</i>	Leafless Bitter-pea	N				·	X			
<i>Daviesia ulicifolia</i> ssp. <i>incarnata</i>	Gorse Bitter-pea	Y				·	X	X		X
<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther Flax-lily	Y					X	X		X
<i>Dichondra repens</i>	Kidney Weed	Y					X			X
<i>Digitaria brownii</i>	Cotton Panic-grass	Y					X	X		
<i>Dillwynia hispida</i>	Red Parrot-pea	Y					X	X		X
<i>Disa bracteata</i>	South African Weed Orchid	Y								X
<i>Diuris orientis</i>	Wallflower Donkey-orchid	Y					X	X		
<i>Diuris pardina</i>	Spotted Donkey-orchid	Y					X			
<i>Dodonaea viscosa</i> ssp. <i>cuneata</i>	Wedge-leaf Hop-bush	N					X			
<i>Dodonaea viscosa</i> ssp. <i>spatulata</i>	Sticky Hop-bush	Y					X	X		X
<i>Drosera auriculata</i>	Tall Sundew	Y					X	X		X
<i>Drosera glanduligera</i>	Scarlet Sundew	Y					X	X		X

<i>Drosera macrantha</i>	Climbing Sundew	Y					X			
<i>Drosera peltata</i> (NC)	Pale Sundew	Y					X	X		X
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Drosera whittakeri</i>	Scented Sundew	Y					X	X		X
<i>Echium plantagineum</i>	Salvation Jane	N								X
<i>Ehrharta calycina</i>	Perennial Veldt Grass	N								X
<i>Ehrharta longifolia</i>	Annual Veldt Grass	N								X
<i>Einadia nutans</i> ssp. <i>nutans</i>	Climbing Saltbush	Y					X			X
<i>Enneapogon nigricans</i>	Black-head Grass	Y					X	X	X	X
<i>Epilobium hirtigerum</i>	Hairy Willow-herb	Y				.	X			X
<i>Eriochilus cucullatus</i>	Parsons Bands	Y				.	X			
<i>Erodium aureum</i>		N								X
<i>Eucalyptus camaldulnesis</i>	River Red Gum	Y					X			X
<i>Eucalyptus fasciculosa</i>	Pink Gum	Y		Rare			X	X		X
<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	South Australian Blue Gum	Y					X	X		X
<i>Euphorbia terracina</i>	False Caper	N					X			X
<i>Eutaxia microphylla</i>	Common Eutaxia	Y					X	X		X
<i>Exocarpos cupressiformis</i>	Native Cherry	Y					X	X		X
<i>Fumaria</i> sp.	Fumitory	N								X
<i>Galium aparine</i>	Cleavers	N								X
<i>Galium gaudichaudii</i> (NC)	Rough Bedstraw	Y					X	X		
<i>Galium murale</i>	Small Bedstraw	N								X
<i>Gazania linearis</i>	Gazania	N								X
<i>Gazania</i> sp.	Gazania	N					X			
<i>Genista monspessulana</i>	Montpellier Broom	N					X			
<i>Genoplesium rufum</i>	Red Midge-orchid	Y				.	X			
<i>Geranium retrorsum</i>	Grassland Geranium	c					X			

<i>Gladiolus undulatus</i>	Wild Gladiolus	N								X
<i>Glossodia major</i>	Purple Cockatoo	Y					X	X		X
<i>Gompholobium ecostatum</i>	Dwarf Wedge-pea	Y					X			
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Gonocarpus elatus</i>	Hill Raspwort	Y					X	X		X
<i>Gonocarpus meianus</i>	Broad-leaf Raspwort	Y					X	X		
<i>Gonocarpus tetragynus</i>	Small-leaf Raspwort	Y					X	X		
<i>Goodenia amplexans</i>	Clasping Goodenia	Y			Uncommon		X	X		X
<i>Goodenia blackiana</i>	Native Primrose	Y					X	X		X
<i>Goodenia geniculata</i>	Bent Goodenia	Y					X	X		X
<i>Grevillea lavandulacea</i> ssp. <i>lavandulacea</i>	Spider-flower	Y					X	X		X
<i>Hakea carinata</i>	Erect Hakea	Y					X	X		X
<i>Hakea rostrata</i>	Beaked Hakea	Y					X	X		X
<i>Hakea rugosa</i>	Dwarf Hakea	Y					X	X		X
<i>Hardenbergia violacea</i>	Native Lilac	Y					X	X		X
<i>Helminthotheca echioides</i>	Ox-tongue	N								X
<i>Hibbertia crinita</i>	Velvet-leaf Guinea-flower	Y						X		
<i>Hibbertia riparia</i>	Guinea-Flower	Y					X			
<i>Hibbertia sericea</i>	Silky Guinea-Flower	Y					X			X
<i>Homopholis proluta</i>	Rigid Panic	Y			Rare		X			
<i>Hordeum leporinum</i>	Wall Barley-grass	N								X
<i>Hydrocotyle callicarpa</i>	Tiny Pennywort	Y								X
<i>Hydrocotyle</i> sp.	Pennywort	Y					X	X		
<i>Hypochoeris glabra</i>	Smooth Cats Ear	N								X
<i>Hypochoeris radicata</i>	Rough Cats Ear	N								X
<i>Isolepis levynsiana</i>	Tiny Flat-sedge	N						X		
<i>Ixodia achillaeoides</i> ssp. <i>alata</i>	Hills Daisy	Y					X	X		

<i>Juncus pallidus</i>	Pale Rush	Y								X
<i>Juncus pauciflorus</i>	Loose-flower Rush	Y					X			
<i>Juncus subsecundus</i>	Finger Rush	Y					X	X		X
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Juncus usitatus</i>	Common Rush	?					X			
<i>Kennedia prostrata</i>	Scarlet Runner	Y					X			X
<i>Lathyrus tingitanus</i>	Tangier Pea	N					X			X
<i>Laxmannia orientalis</i>	Dwarf Wire-lily	Y					X	X		X
<i>Lepidosperma carphoides</i>	Black Rapier-sedge	Y					X	X		X
<i>Lepidosperma curtisiae</i>	Little Sword-sedge	Y					X	X		X
<i>Lepidosperma lineare</i>	Little Sword-sedge	Y							X	
<i>Lepidosperma viscidum</i>	Sticky Sword-sedge	Y					X	X		X
<i>Leptorhynchus squamatus</i>	Scaly Buttons	Y					X			
<i>Leptospermum myrsinoides</i>	Heath Tea-tree	Y					X			X
<i>Leucopogon concurvus</i>	Scrambling Beard-heath	Y					X			
<i>Levenhookia pusilla</i>	Tiny Stylewort	Y					X	X		X
<i>Linum marginale</i>	Native Flax	Y					X	X		X
<i>Lobelia gibbosa</i>	Tall Lobelia	Y					X			
<i>Lolium rigidum</i>	Wimmera Ryegrass	N								X
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush	Y					X	X	X	X
<i>Lomandra micrantha</i> ssp. <i>tuberculata</i>	Small-flower Mat-rush	Y					X	X	X	X
<i>Lomandra multiflora</i> ssp. <i>dura</i>	Hard Mat-rush	Y					X	X		X
<i>Lomandra nana</i>	Small Mat-rush	Y					X	X	X	X
<i>Lomandra sororia</i>	Sword Mat-rush	Y			Uncommon		X	X		X
<i>Lysiana exocarpi</i> ssp. <i>exocarpi</i>	Harlequin Mistletoe	Y					X	X		X
<i>Lysimachia arvensis</i>	Pimpernel	N								X
<i>Lythrum hyssopifolia</i>	Lesser Loosestrife	Y					X	X		

<i>Maireana enchylaenoides</i>	Wingless Fissure-plant	Y			Uncommon	.	X			
<i>Medicago polymorpha</i>	Burr-medic	N								X
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Rice-grass	Y					X			
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Microtis unifolia</i> complex	Onion-orchid	Y					X	X		X
<i>Millotia tenuifolia</i> var. <i>tenuifolia</i>	Soft Millotia	Y					X			
<i>Moraea flaccida</i>	One-leaf Cape Tulip	N								X
<i>Moraea setifolia</i>	Thread Iris	N								X
<i>Neurachne alopecuroidea</i>	Fox-tail Mulga Grass	Y					X			X
<i>Olea europaea</i> ssp.	Olive	N					X			X
<i>Olearia ramulosa</i>	Twiggy Daisy-bush	Y					X	X		X
<i>Opercularia turpis</i>	Twiggy Stinkweed	Y				.	X	X		
<i>Opuntia</i> sp.	Prickly Pear	N					X			
<i>Orthoceras strictum</i>	Horned Orchid	Y			Rare	.	X	X		
<i>Oxalis perennans</i>	Native Sorrel	Y								X
<i>Oxalis pes-caprae</i>	Soursob	N					X			X
<i>Panicum effusum</i> var. <i>effusum</i>	Hairy Panic	Y			K	.	X		X	
<i>Pelargonium littorale</i>	Native Pelargonium	Y				.	X			
<i>Pentameris pallida</i>	Pussy Tail	N								X
<i>Phalaris aquatica</i>	Phalaris	N					X			
<i>Pheladenia deformis</i>	Bluebeard Orchid	Y					X	X		
<i>Pimelea glauca</i>		Y							X	
<i>Pimelea humilis</i>	Low Riceflower	Y					X	X		X
<i>Pimelea linifolia</i> ssp. <i>linifolia</i>	Slender Riceflower	Y					X	X		X
<i>Pimelea stricta</i>	Erect Riceflower	Y					X	X		
<i>Piptatherum miliaceum</i>	Rice Millet	N					X			X

<i>Plantago gaudichaudii</i>	Narrow-leaf Plantain	Y			Uncommon		X			
<i>Plantago lanceolata</i> var.	Ribwort	N								X
<i>Plantago</i> sp. B (R.Bates 44765)	Little Plantain	Y					X	X		
<i>Poa annua</i>	Winter Grass	N								X
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Poa clelandii</i>	Matted Tussock-grass	Y				.	X	X		
<i>Poranthera microphylla</i>	Small Poranthera	Y					X			X
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	Y	Vulnerable	Rare	Vulnerable	.	X			X
<i>Prosopphyllum pruinosum</i>	Plum Leek-orchid	Y	Endangered	Vulnerable	Endangered		X			X
<i>Prostanthera behriana</i>	Downy Mintbush	Y			Uncommon	.	X	X		X
<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweek	Y					X			
<i>Pterostylis nana</i>	Dwarf Greenhood	Y					X			
<i>Pterostylis pedunculata</i>	Maroon-hood	Y					X			X
<i>Pterostylis sanguinea</i>	Blood Greenhood	Y					X	X		X
<i>Ptilotus erubescens</i>	Hairy-tails	Y		Rare		.	X	X	X	X
<i>Pultenaea acerosa</i>	Bristly Bush-pea	Y			Uncommon		X	X		X
<i>Pultenaea largiflorens</i>	Twiggy Bush-pea	Y					X	X		X
<i>Quinetia urvillei</i>	Quinetia	Y					X	X		
<i>Rhamnus alaternus</i>	Buckthorn	N								
<i>Romulea rosea</i> var. <i>australis</i>	Common Onion-grass	N								X
<i>Rumex conglomeratus</i>	Clustered Dock	N								X
<i>Rytidosperma auriculatum</i>	Short Wallaby-grass	Y					X	X	X	
<i>Rytidosperma caespitosum</i> (NC)	Common Wallaby-grass	Y					X	X		X
<i>Rytidosperma fulvum</i>	Leafy Wallaby-grass	Y			Uncommon		X	X	X	X
<i>Rytidosperma pilosum</i> var. <i>pilosum</i>		Y					X		X	X
<i>Rytidosperma setaceum</i>	Small-flower Wallaby-grass	Y					X	X	X	

<i>Santalum acuminatum</i>	Quandong	Y			Vulnerable	·	X	X		X
<i>Scaevola alba</i>	Pale Fanflower	Y					X	X		
<i>Schoenus apogon</i>	Common Bog-rush	Y					X	X		X
<i>Schoenus breviculmis</i>	Matted Bog-rush	Y					X	X		X
<i>Senecio hypoleucus</i>	Pale Groundsel	Y			Uncommon	·	X			
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Senna artemisioides</i> ssp. <i>X coriacea</i>	Broad-leaf Desert Senna	Y					X	X		
<i>Siloxerus multiflorus</i>	Small Wrinklewort	Y					X	X		
<i>Sonchus oleraceus</i>	Common Sow-thistle	N								X
<i>Sparaxis bulbifera</i>	Sparaxis	N					X			X
<i>Sporobolus africanus</i>	Rat-tail Grass	N					X	X		
<i>Spyridium parvifolium</i>	Dusty Miller	Y				·	X			
<i>Spyridium vexilliferum</i>	Winged Spyridium	Y					X	X		
<i>Stenantha conostephioides</i>	Flame Heath	Y					X	X		X
<i>Stylidium calcaratum</i>	Spurred Trigger-plant	Y					X	X		
<i>Stylidium despectum</i>	Hundreds And Thousands	Y					X	X		
<i>Thelymitra antennifera</i>	Lemon Sun-orchid	Y					X	X		
<i>Thelymitra luteocilium</i>	Yellow-tuft Sun Orchid	Y						X		
<i>Thelymitra nuda</i>	Scented Sun-orchid	Y					X			
<i>Thelymitra pauciflora</i>	Slender Sun-orchid	Y					X			X
<i>Thelymitra rubra</i>	Salmon Sun-orchid	Y					X	X		X
<i>Themeda triandra</i>	Kangaroo Grass	Y					X	X	X	X
<i>Thysanotus patersonii</i>	Twining Fringe-lily	Y					X	X		X
<i>Trachymene cyanopetala</i>	Purple Trachymene	Y			Rare		X	X		
<i>Trachymene pilosa</i>	Dwarf Trachymene	Y					X	X		X
<i>Tricoryne elatior</i>	Yellow Rush-lily	Y					X	X		X
<i>Trifolium angustifolium</i>	Narrow -leaf Clover	N								X

<i>Trifolium arvense</i> var. <i>arvense</i>	Hares-foot Clover	N								X
<i>Trifolium campestre</i>	Hop Clover	N								X
<i>Tropaeolum major</i>	Nasturtium	N								X
<i>Typha domingensis</i>	Narrow-leaf Bulrush	Y								
<i>Velleia paradoxa</i>	Spur Velleia	Y			Uncommon		X			X
PLANT SPECIES	COMMON NAME	NATIVE	THREATENED STATUS				DATA SOURCE			
			EPBC	State	Regional	park level	KB 2005	Nature Maps	AP 2020	LJ/RD 2020
<i>Vicia sativa</i> ssp.	Common Vetch	N								X
<i>Vinca major</i>	Blue Periwinkle	N					X			
<i>Vittadinia blackii</i>		Y			Rare		X		X	X
<i>Vittadinia cuneata</i> var. <i>cuneata</i>	Fuzzy New Holland Daisy	Y					X	X		X
<i>Vulpia</i> sp.	Fescue	N								X
<i>Wahlenbergia preissii</i>		Y								X
<i>Wahlenbergia stricta</i> ssp. <i>stricta</i>	Tall Bluebell	Y					X			
<i>Walwhalleya proluta</i> (NC)	Rigid Panic	Y					X	X		
<i>Watsonia meriana</i> cv <i>bulbillifera</i>	Bulbil Watsonia	N					X			
<i>Wurmbea dioica</i> ssp. <i>dioica</i>	Early Nancy	Y					X			
<i>Xanthorrhoea quadrangulata</i>	Rock Grass-tree	Y					X	X		X
<i>Xanthorrhoea semiplana</i> ssp. <i>semiplana</i>	Yacca	Y					X	X		
<i>Xanthosia huegelii</i>	Hairy Xanthosia	Y					X	X		
<i>Zantedeschia aethiopica</i>	White Arum Lily	N					X			X

Appendix 3

Recorded fauna species at Wadmore Park/Pulyonna Wirra

CLASS NAME	SPECIES	COMMON NAME	NATIVE	NATIONAL RATING	STATE RATING	MLR RATING	Fahey-Sparks 2019	NGT 2020	Wadmore	2K Buffer
ACTINOPTERI	<i>Galaxias olidus (NC)</i>	Mountain Galaxias	Y							X
AMPHIBIA	<i>Limnodynastes dumerilii</i>	Banjo Frog	Y					X		X
AMPHIBIA	<i>Pseudophryne bibroni</i>	Bibrons Toadlet/Browns Toadlet	Y		Rare			X		
AMPHIBIA	<i>Litoria ewingi</i>	Brown Tree Frog	Y							X
AMPHIBIA	<i>Crinia signifera</i>	Common Froglet	Y							X
AMPHIBIA	<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog	Y							X
AVES	<i>Myiagra inquieta</i>	Restless Flycatcher	Y		Rare	Endangered	X		X	X
AVES	<i>Phaps elegans</i>	Brush Bronzewing	Y			Uncommon			X	X
AVES	<i>Anthochaera chrysoptera chrysoptera</i>	Little Wattlebird (mainland SA)	Y			Uncommon	X		X	X
AVES	<i>Turnix varius varius</i>	Painted Buttonquail	Y		Rare	Uncommon				X
AVES	<i>Pachycephala rufiventris rufiventris</i>	Rufous Whistler	Y			Uncommon	X		X	X
AVES	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Y			Uncommon				X
AVES	<i>Podargus strigoides</i>	Tawny Frogmouth	Y			Uncommon	X		X	X
AVES	<i>Gliciphila melanops</i>	Tawny-crowned Honeyeater	Y			Uncommon			X	X
AVES	<i>Petrochelidon nigricans</i>	Tree Martin	Y			Uncommon	X		X	X
AVES	<i>Pomatostomus superciliosus</i>	White-browed Babbler	Y			Uncommon			X	X
AVES	<i>Melithreptus lunatus</i>	White-naped Honeyeater	Y			Uncommon			X	X
AVES	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	Y			Uncommon			X	X
AVES	<i>Taeniopygia guttata castanotis</i>	Zebra Finch	Y			Uncommon			X	X
AVES	<i>Hylacola pyrrhopygia parkeri</i>	Chestnut-rumped Heathwren (Mount Lofty Ranges)	Y	Endangered	Endangered	Vulnerable				X
AVES	<i>Stagonopleura guttata</i>	Diamond Firetail	Y		Vulnerable	Vulnerable				X
AVES	<i>Cacomantis flabelliformis flabelliformis</i>	Fan-tailed Cuckoo	Y			Vulnerable			X	X
AVES	<i>Psephotus haematonotus haematonotus</i>	Red-rumped Parrot (eastern SA except NE)	Y			Vulnerable	X		X	X

CLASS NAME	SPECIES	COMMON NAME	NATIVE	NATIONAL RATING	STATE RATING	MLR RATING	Fahey-Sparks 2019	NGT 2020	Wadmore	2K Buffer
AVES	<i>Petroica boodang boodang</i>	Scarlet Robin	Y		Rare	Vulnerable			X	X
AVES	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo	Y		Vulnerable	Vulnerable	X			
AVES	<i>Platycercus elegans fleurieuensis</i> & <i>elegans subadelaidae</i>	Adelaide Rosellas (MN, AP, MLR)	Y							X
AVES	<i>Ninox boobook</i>	Australian Boobook	Y							X
AVES	<i>Pachycephala pectoralis</i>	Australian Golden Whistler	Y						X	X
AVES	<i>Falco longipennis</i>	Australian Hobby					X			
AVES	<i>Gymnorhina tibicen</i>	Australian Magpie	Y				X		X	X
AVES	<i>Pelecanus conspicillatus</i>	Australian Pelican	Y							X
AVES	<i>Anthus australis</i>	Australian Pipit	Y						X	X
AVES	<i>Corvus coronoides</i>	Australian Raven	Y							X
AVES	<i>Daphoenositta chrysoptera pileata</i>	Black-capped Sittella	Y						X	X
AVES	<i>Melithreptus gularis</i>	Black-chinned Honeyeater	Y		ssp				X	X
AVES	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike	Y				X		X	X
AVES	<i>Strepera versicolor melanoptera</i>	Black-winged Currawong (MLR, MM, SE)	Y						X	X
AVES	<i>Falco berigora</i>	Brown Falcon	Y						X	X
AVES	<i>Accipiter fasciatus fasciatus</i>	Brown Goshawk	Y				X		X	X
AVES	<i>Acanthiza pusilla samueli</i>	Brown Thornbill (MLR)	Y						X	X
AVES	<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater	Y				X		X	X
AVES	<i>Melopsittacus undulatus</i>	Budgerigar	Y							X
AVES	<i>Acanthiza reguloides australis</i>	Buff-rumped Thornbill	Y						X	X
AVES	<i>Hylacola pyrrhopygia</i>	Chestnut-rumped Heathwren	Y	ssp	ssp				X	X
AVES	<i>Accipiter cirrocephalus cirrocephalus</i>	Collared Sparrowhawk	Y				X			X
AVES	<i>Turdus merula merula</i>	Common Blackbird	N				X		X	X
AVES	<i>Phaps chalcoptera</i>	Common Bronzewing	Y				X		X	X
AVES	<i>Sturnus vulgaris vulgaris</i>	Common Starling	N				X		X	X

CLASS NAME	SPECIES	COMMON NAME	NATIVE	NATIONAL RATING	STATE RATING	MLR RATING	Fahey-Sparks 2019	NGT 2020	Wadmore	2K Buffer
AVES	<i>Phylidonyris pyrrhopterus</i>	Crescent Honeyeater	Y						X	X
AVES	<i>Phylidonyris pyrrhopterus halmaturinus</i>	Crescent Honeyeater (KI and MLR)	Y							X
AVES	<i>Ocyphaps lophotes</i>	Crested Pigeon	Y				X		X	X
AVES	<i>Platycercus elegans</i>	Crimson Rosella	Y				X		X	X
AVES	<i>Corvus</i> sp.	Crows	Y							X
AVES	<i>Artamus cyanopterus</i>	Dusky Woodswallow	Y				X			X
AVES	<i>Platycercus eximius</i>	Eastern Rosella	Y				X			X
AVES	<i>Falcunculus frontatus frontatus</i>	Eastern Shriketit	Y		Rare				X	X
AVES	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	Y				X		X	X
AVES	<i>Acanthorhynchus tenuirostris halmaturinus</i>	Eastern Spinebill (KI, MLR, southern FR)	Y							X
AVES	<i>Neophema elegans elegans</i>	Elegant Parrot	Y		Rare					X
AVES	<i>Chloris chloris</i>	European (Common) Greenfinch	N						X	X
AVES	<i>Carduelis carduelis britannica</i>	European Goldfinch	N						X	X
AVES	<i>Columba livia</i>	Feral Pigeon	N						X	X
AVES	<i>Eolophus roseicapilla</i>	Galah	Y				X		X	X
AVES	<i>Pachycephala pectoralis</i>	Golden Whistler	Y				X			
AVES	<i>Strepera versicolor</i>	Grey Currawong	Y		ssp		X			X
AVES	<i>Rhipidura albiscapa</i>	Grey Fantail	Y				X		X	X
AVES	<i>Colluricincla harmonica</i>	Grey Shrikethrush	Y				X		X	X
AVES	<i>Chalcites basalis</i>	Horsfield's Bronze Cuckoo	Y						X	X
AVES	<i>Passer domesticus domesticus</i>	House Sparrow	N				X		X	X
AVES	<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Y				X		X	X
AVES	<i>Cacatua sanguinea sanguinea</i>	Little Corella	Y				X		X	X
AVES	<i>Corvus mellori</i>	Little Raven	Y				X		X	X
AVES	<i>Poephila acuticauda</i>	Long-tailed Finch	Y						X	X
AVES	<i>Grallina cyanoleuca</i>	Magpielark	Y				X		X	X

CLASS NAME	SPECIES	COMMON NAME	NATIVE	NATIONAL RATING	STATE RATING	MLR RATING	Fahey-Sparks 2019	NGT 2020	Wadmore	2K Buffer
AVES	<i>Chenonetta jubata</i>	Maned Duck/Australian Wood Duck	Y				X			X
AVES	<i>Dicaeum hirundinaceum hirundinaceum</i>	Mistletoebird	Y				X		X	X
AVES	<i>Glossopsitta concinna</i>	Musk Lorikeet	Y				X		X	X
AVES	<i>Falco cenchroides</i>	Nankeen Kestrel	Y							X
AVES	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Y				X		X	X
AVES	<i>Phylidonyris novaehollandiae novaehollandiae</i>	New Holland Honeyeater (mainland SA)	Y							X
AVES	<i>Manorina melanocephala</i>	Noisy Miner	Y				X		X	X
AVES	<i>Anas superciliosa</i>	Pacific Black Duck	Y				X			X
AVES	<i>Cacomantis pallidus</i>	Pallid Cuckoo	Y							X
AVES	<i>Pardalotus sp.</i>	pardalotus	Y							X
AVES	<i>Geopelia placida placida</i>	Peaceful Dove	Y						X	X
AVES	<i>Parvipsitta porphyrocephala</i>	Purple-crowned Lorikeet	Y				X		X	X
AVES	<i>Merops ornatus</i>	Rainbow Bee-eater	Y						X	X
AVES	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Y				X		X	X
AVES	<i>Anthochaera carunculata</i>	Red Wattlebird	Y				X		X	X
AVES	<i>Neochmia temporalis temporalis</i>	Red-browed Finch	Y				X		X	X
AVES	<i>Columba livia</i>	Rock Dove					X			
AVES	<i>Cincloramphus mathewsi</i>	Rufous Songlark	Y						X	X
AVES	<i>Zosterops lateralis</i>	Silvereye	Y				X		X	X
AVES	<i>Ninox novaeseelandiae</i>	Southern Boobook	Y				X			
AVES	<i>Spilopelia chinensis</i>	Spotted Dove	N				X		X	X
AVES	<i>Pardalotus punctatus</i>	Spotted Pardalote	Y				X		X	X
AVES	<i>Lophoictinia isura</i>	Square-tailed Kite					X			
AVES	<i>Pardalotus striatus substriatus</i>	Striated Pardalote	Y				X		X	X
AVES	<i>Acanthiza lineata</i>	Striated Thornbill	Y						X	X

CLASS NAME	SPECIES	COMMON NAME	NATIVE	NATIONAL RATING	STATE RATING	MLR RATING	Fahey-Sparks 2019	NGT 2020	Wadmore	2K Buffer
AVES	<i>Acanthiza lineata clelandi</i>	Striated Thornbill (MLR, SE)	Y							X
AVES	<i>Coturnix pectoralis</i>	Stubble Quail	Y						X	X
AVES	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Y				X		X	X
AVES	<i>Malurus cyaneus</i>	Superb Fairywren	Y				X			X
AVES	<i>Malurus cyaneus leggei</i>	Superb Fairywren (Mainland SA)	Y						X	X
AVES	<i>Acanthiza</i> sp.	thornbills	Y							X
AVES	<i>Aquila audax</i>	Wedge-tailed Eagle	Y				X			X
AVES	<i>Smicrornis brevirostris</i>	Weebill	Y				X		X	X
AVES	<i>Hirundo neoxena neoxena</i>	Welcome Swallow	Y				X		X	X
AVES	<i>Sericornis frontalis</i> (NC)	White-browed Scrubwren	Y							X
AVES	<i>Egretta novaehollandiae</i>	White-faced Heron	Y				X		X	X
AVES	<i>Ptilotula penicillata</i>	White-plumed Honeyeater	Y						X	X
AVES	<i>Cormobates leucophaea grisescens</i>	White-throated Treecreeper (MLR)	Y							X
AVES	<i>Lalage tricolor</i>	White-winged Triller	Y				X		X	X
AVES	<i>Rhipidura leucophrys leucophrys</i>	Willie Wagtail	Y						X	X
AVES	<i>Acanthiza nana</i>	Yellow Thornbill	Y				X			X
AVES	<i>Caligavis chrysops</i>	Yellow-faced Honeyeater	Y							X
AVES	<i>Caligavis chrysops samueli</i>	Yellow-faced Honeyeater (MLR, southern FR)	Y				X		X	X
Invertebrates	<i>Thalaina angulosa</i>	Angled Satin Moth	U					X		
Invertebrates		Antlion	U					X		
Invertebrates	<i>Spilosoma glatignyi</i>	Black & White Tiger Moth	U					X		
Invertebrates	<i>Orthetrum</i>	Blue Skimmer	U					X		
Invertebrates	<i>Oenosandra boisduvalii</i>	Boisduvals Autumn Moth	U					X		
Invertebrates		Camouflage Grasshopper	U					X		
Invertebrates	<i>Camponotus</i> species	Camponotus ant	U					X		
Invertebrates		Carbid beetle	U					X		

CLASS NAME	SPECIES	COMMON NAME	NATIVE	NATIONAL RATING	STATE RATING	MLR RATING	Fahey-Sparks 2019	NGT 2020	Wadmore	2K Buffer
Invertebrates	<i>Ptomaphila lacrymosa</i>	Carrion Beetle	U					X		
Invertebrates	<i>Heteronympha merope</i>	Common Brown Butterfly	U					X		
Invertebrates	<i>Zizina labradus</i>	Common Grass Blue Butterfly	U					X		
Invertebrates	<i>Papilio anactus</i>	Dainty Swallow-tail	U					X		
Invertebrates	<i>Monoctenia smerintharia</i>	Dark Leaf Moth	U					X		
Invertebrates	<i>Epyaxa hyperythra</i>	Geometrid	U					X		
Invertebrates	<i>Abantiades argentata</i>	Ghost Moth	U					X		
Invertebrates	<i>Abantiades atripalpis</i>	Ghost Moth	U					X		
Invertebrates	<i>Abantiades marcidus</i>	Ghost Moth	U					X		
Invertebrates		Grasshopper - locust	U					X		
Invertebrates		Green-eyed Fly	U					X		
Invertebrates	<i>Bolb</i> species	Ground Mantis	U					X		
Invertebrates	<i>Apis</i> species	Honey bee	U					X		
Invertebrates	<i>Iridomyrmex</i> species	Jumper Ants	U					X		
Invertebrates	<i>Junonia villida</i>	Meadow Argus	U					X		
Invertebrates	<i>Eriphora</i> species	Orb Weaver Spider	U					X		
Invertebrates	<i>Trichiocerus</i> species	Sparshalls Moth	U					X		
Invertebrates		Trapdoor Spider	U					X		
Invertebrates	<i>Danaus plexippus</i>	Wanderer	U					X		
Invertebrates	<i>Idaea costaria</i>	White-edged Wave	U					X		
Invertebrates	<i>Porela albifinis</i>	White-tailed Porela	U					X		
Invertebrates	<i>Lycosa australicosa</i>	Wolf Spider	U					X		
MAMMALIA	<i>Macropus</i> sp.		Y					X		X
MAMMALIA	<i>Rattus rattus</i>	Black Rat (Ship Rat, Roof Rat)	N							X
MAMMALIA	<i>Trichosurus vulpecula</i>	Common Brushtail Possum	Y		Rare			X		X
MAMMALIA	<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	Y							X
MAMMALIA	<i>Vulpes vulpes</i>	Fox (Red Fox)	N					X		X
MAMMALIA	<i>Capra hircus</i>	Goat (Feral Goat)	N							X

CLASS NAME	SPECIES	COMMON NAME	NATIVE	NATIONAL RATING	STATE RATING	MLR RATING	Fahey-Sparks 2019	NGT 2020	Wadmore	2K Buffer
MAMMALIA	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Y	Vulnerable	Rare			X		X
MAMMALIA	<i>Mus musculus</i>	House Mouse	N							X
MAMMALIA	<i>Phascolarctos cinereus</i>	Koala	Y					X		X
MAMMALIA	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	Y	ssp	ssp					X
MAMMALIA	<i>Macropus fuliginosus</i>	Western Grey Kangaroo	Y							X
MAMMALIA	<i>Tadarida australis</i>	White-striped Free-tail Bat						X		
MAMMALIA	<i>Antechinus flavipes</i>	Yellow-footed Antechinus	Y		Vulnerable					X
REPTILIA	<i>Lerista bougainvillii</i>	Bougainville's Skink	Y					X		X
REPTILIA	<i>Underwoodisaurus milii</i>	Common Barking Gecko	Y							X
REPTILIA	<i>Pygopus lepidopodus</i>	Common Scaly-foot	Y							X
REPTILIA	<i>Egernia cunninghami</i>	Cunningham's Skink	Y		Endangered					X
REPTILIA	<i>Menetia greyii</i>	Dwarf Skink	Y							X
REPTILIA	<i>Pogona barbata</i>	Eastern Bearded Dragon	Y							X
REPTILIA	<i>Tiliqua scincoides</i>	Eastern Bluetongue	Y							X
REPTILIA	<i>Ctenotus spaldingi</i>	Eastern Striped Skink	Y							X
REPTILIA	<i>Eulamprus quoyii</i>	Eastern Water Skink	Y							X
REPTILIA	<i>Lampropholis guichenoti</i>	Garden Skink	Y					X		X
REPTILIA	<i>Delma malleri</i>	Gulfs Delma	Y							X
REPTILIA	<i>Aprasia striolata</i>	Lined Worm-lizard	Y							X
REPTILIA	<i>Christinus marmoratus</i>	Marbled Gecko	Y					X		X
REPTILIA	<i>Tiliqua rugosa</i>	Sleepy Lizard	Y							X
REPTILIA	<i>Ctenotus orientalis</i>	Spotted Ctenotus	Y					X		X
REPTILIA	<i>Ctenophorus decresii</i>	Tawny Dragon	Y							X
REPTILIA	<i>Hemiergis decresiensis</i>	Three-toed Earless Skink	Y					X		X
REPTILIA	<i>Liopholis whitii</i>	White's Skink	Y							X

Appendix 4

Risk Assessment of recommendations

Recommendation	Option	Risk description	Likelihood	Consequences		Total score	Risk average
				Ecological	People		
Convene a steering group to co-develop a burn on Park proposal	Implementation	Distracts from other important on-ground work	2	1	1	4.0	5.0
		Delay the actual implementation of the burns	2	3	1	6.0	
	Do nothing	Key information and experiences are not considered within the planning phase	3	3	1	7.0	
		No stakeholder buy-in	3	1	4	8.0	
		Critical considerations and processes are not addressed	4	3	2	9.0	
Develop a user-friendly fact sheet on ecological and cultural burns	Implementation	Development is rushed and information presented not is not accurate	1	1	3	5.0	5.5
		Incites community anxiety over potential burns	2	1	4	7.0	
		Delays the implementation of burns	2	3	1	6.0	
		Disagreement about the purpose of content of the fact sheets	1	1	2	4.0	
	Do nothing	Community confusion over the different types of burns	3	1	3	7.0	
		Community/visitors requesting fuel reduction burns	4	2	2	8.0	
		Community/residents misinformed about burns for biodiversity outcomes versus fuel reduction burns	4	1	2	7.0	
Implement a trial ecological burn in the priority area	Implementation	Fire spreads into other areas of the park	1	3	1	5.0	7.8
		Embers enter private property	1	1	4	6.0	
		Health risks with smoke inhalation	2	1	3	6.0	
		Burn enters A.paradoxa areas and increases germination of species	1	4	1	6.0	
		Burn stimulates weed seed bank and germination	3	3	2	8.0	
	Do nothing	Ongoing decline of threatened species that require fire for germination and persistence	3	4	1	8.0	
		Undesirable trajectory of significant heathland areas	3	4	2	9.0	
		Ongoing decline of vegetation dynamics and regeneration	3	4	2	9.0	
Work with Kaurna to trial a cultural burn in the grassy woodland area	Implementation	It is not undertaken in partnership with Kaurna	1	2	4	7.0	6.0
		Cultural sensitivities and protocols are not followed	2	1	5	8.0	
		The fire spreads into other areas or produces ember attacks	2	3	1	6.0	

	Do nothing	The fire results in increased weed germination	3	3	1	7.0	6.8
		Community anxiety and concern	3	1	2	6.0	
		Missed opportunity to lead an example by working with Kaurua	4	1	2	7.0	
		Opportunity loss to learn about traditional land management	4	3	3	10.0	
		Native grass diversity is reduced	4	4	1	9.0	
Conduct soil seedbank trials within the proposed burn area	Implementation	Soil disturbance impacts (compaction, disturbance of microphytic crust)	3	2	1	6.0	6.5
	Do nothing	Invasion of weed species from source site	2	3	2	7.0	
		Knowledge deficiencies as restoration only based on above ground attributes	2	3	2	7.0	
Organise a field day to view the results from other ecological burns	Implementation	Distracts from other on-ground work and priorities	1	2	1	4.0	5.5
	Do nothing	Delays implementation of ecological and/or cultural burns	1	3	3	7.0	
		Community and stakeholders do not support ecological burning in the Park	3	1	3	7.0	
Trial the manual removal of A.paradoxa in priority heath areas	Implementation	Community expectation to remove A.paradoxa for fuel reduction purposes	4	1	2	7.0	7.0
		Impacts on threatened bird species	2	4	2	8.0	
		Off-target impacts from operational procedures eg trampling, bringing in weed seeds	2	3	1	6.0	
	Do nothing	Reduced habitat for native fauna	3	3	1	7.0	
		A.paradoxa continues to move into high vegetation integrity areas	4	4	1	9.0	
		Loss of heathland species	4	4	1	9.0	
		No natural recruitment	3	4	1	8.0	
Trial intervention approaches to restore native grasses	Implementation	Community opposition to the trial	3	1	3	7.0	6.6
		Disagreement about what the restoration outcome should be	4	2	3	9.0	
		Off-target impacts from operational procedures e.g. trampling, bringing in weed seeds	3	2	1	6.0	
		Loss of potential habitat for species dependant on trees and shrubs	2	2	1	5.0	
	Do-nothing	Gap creation that encourages weed germination	3	2	1	6.0	
		Loss of distinctive grassland feature that is unique to the Park	3	3	1	7.0	
		Reduced native grass diversity and abundance	3	4	1	8.0	
		Opportunity loss of learning by doing	3	3	2	8.0	
Targeted weed management of priority weed species	Implementation	Resources taken away from other on-ground works	1	2	1	4.0	5.0
		Off-target damage	2	3	1	6.0	
	Do-nothing	Increase of weed species/ weeds out-competing native species/loss of plant biodiversity	4	4	1	9.0	
		Community dissatisfaction with deterioration of biodiversity	3	2	2	7.0	

		Loss of structural diversity within vegetation communities	3	3	1	7.0	
		Loss of fauna species diversity	3	3	2	8.0	7.8
Record any suspected dieback and collect soil samples for PC testing	Implementation	Costly in terms of staff/volunteer time and fees for testing soil samples	2	1	1	4.0	
		Detracts from other core work	1	2	1	4.0	4.0
	Do-nothing	Reputational risk to Council	2	1	1	4.0	
		If dieback is caused by PC then susceptible species could also be impacted in Black Hill and neighbouring properties	4	4	3	11.0	7.5
Trial soil inoculation in priority areas	Implementation	Costly and could detract from other core work	2	1	1	4.0	
		Soil disturbance could result in spread of weeds	2	3	1	6.0	5.0
	Do-nothing	Opportunity loss	3	2	1	6.0	
		Limited plant recruitment and decline of species (such as Prasophyllum) that rely on symbiotic fungi	3	2	1	6.0	6.0
Close off identified walking tracks in areas of high vegetation value	Implementation	Disadvantage some users of the Park who rely on those specific tracks	2	1	2	5	
		Uncertainty about the success of the track closure	1	1	1	3	
		Creation of new paths/tracks in proximity to previous ones or park users remove track closure barriers	2	2	1	5	4.3
	Do-nothing	Ongoing deterioration of vegetation	3	3	1	7	
		High impacts in ecologically significant zones as tracks provide opportunities for people to enter these areas	4	3	1	8	
		Reduced area for vegetation recovery and creation of novel habitat for fauna	3	2	1	6	
		Ongoing track maintenance costs for Council	3	1	2	6	6.8
Implement and support community to transition to a dogs-on-leash policy	Implementation	Disadvantages users of the Park that rely on the Park for exercising their dogs	3	1	3	7	
		Wellbeing and health risks to people that rely on walking their dogs off leash for exercise	3	1	4	8	7.5
	Do-nothing	Confusion by park users as dogs are required on leash in some areas but not in others	3	3	3	9	
		Risks to wildlife, soil health and water quality	4	4	2	10	
		Potential safety risks to visitors	2	1	4	7	
		Increased weed invasion into areas that are entered by dogs	3	3	1	7	8.3
Monitor and regulate dumping of domestic and council waste, substrates and plant material	Implementation	Distracts from other core on-ground work	2	1	1	4	4.0

	Do-nothing	Reputational risks as the regulation and compliance are not being enforced	2	1	3	6	
		Spread of weed species and contaminants into waterways	4	3	1	8	
		Loss of amenity value	4	1	2	7	7.0
Implement and monitor a no-mountain-bikes policy with the Park	Implementation	Disadvantages low-impact cyclists	4	1	3	8	
		Community health and well-being impacts as residents (especially families) reduce time outdoors	2	1	3	6	
		Mountain bike riders seek tracks in other parks and thus are just transferring impacts to another area	4	1	3	8	7.3
	Do-nothing	Ongoing deterioration of tracks/paths which has safety implications for park users	3	1	5	9	
		Safety issues for walkers	3	1	3	7	
		Compaction in sensitive areas and impacts on native vegetation recruitment	4	3	2	9	
		Spread of weed species and/or potential spread of pathogens	3	4	1	8	8.3
Review the current Park zoning and build a case for rezoning as a biodiversity reserve	Implementation	Requires considerable investment in Council staff time that could distract from other core work	3	3	1	7	
		Community expectations for other parks/reserves to similarly be rezoned	2	1	3	6	6.5
	Do-nothing	The ecological and biodiversity values of the Park are unprotected	3	4	1	8	
		Opportunity loss of seeking and acquiring grants/funding that can be used for management	4	2	1	7	7.5
Propagate and plant out locally extinct and/or species declining or demonstrating reduced health and avoid plantings that require considerable water	Implementation	Uncertainty about the probability of these species persisting after planting	4	3	1	8	
		Conservation fatigue as work requires effort and lack of success can be disappointing	3	1	3	7	
		Opportunity cost of focussing on these species when more climate adapted species could be used	2	3	1	6	7.0
	Do-nothing	Permanent loss (extinction) of key plant species that are characteristic and unique to the Park	4	4	1	9	
		Absence of these species changes the vegetation community and habitat features and diversity	4	3	1	8	
		Modifies critical ecological functions such as plant-pollination	3	3	1	7	8.0
Protect habitat or provide novel habitat for fauna species that will be impacted by climate change	Implementation	Increase in feral animals such as cats and foxes	2	3	1	6	6.0
	Do-nothing	on-park fauna population is reduced	2	3	3	8	
		fauna population in nearby areas such as BH do not have suitable refuge (eg if there is a bushfire)	3	3	1	7	7.5

Ensure representative C4 grasses and drought tolerant species	Implementation	Resourcing and funding competition with other core on-ground work	2	2	1	5	6.0
		Community and park-user perception that the native grasses are weeds	3	1	3	7	
		C4 and drought tolerant species are highly competitive at the expense of other vegetation species unable to adapt	2	3	1	6	
	Do-nothing	Increased erosion and evapotranspiration because of exposed soil surfaces	3	3	2	8	7.0
		Opportunity loss of committing to Council strategies and the Adapt West initiative	2	1	3	6	
		Community and park-users value the park less as vegetation health deteriorates	3	1	3	7	
Include mixed provenance within the Park (eg 10%)	Implementation	Compromises the genetics of remnant vegetation within the Park and nearby (eg BHCP)	3	2	2	7	7.0
		Climate change is greater than expected and the external provenance does not persist within the Park and/or the provenance source is not appropriate	2	3	1	6	
		Philosophical challenges as land carers, council and community have dedicated considerable volunteer time to focussing on local provenance	4	1	3	8	
		Increased risk of bringing in diseases and pathogens into the Park	3	3	1	7	
	Do-nothing	Reduced genetic robustness and diversity of plant material in the Park	3	3	1	7	7.5
		Reduced success of revegetation and replanting efforts	3	3	2	8	
Consider insurance plantings within the Park	Implementation	Competes with limited resources for protecting existing vegetation	2	2	1	5	5.0
		No guarantee that insurance plantings are successful or will persist with climate change	2	2	1	5	
	Do-nothing	Loss of plant species from the local environment (possibly extinction)	3	3	1	7	7.0
		Community and Landcare disappointment over loss of plant species	3	1	3	7	
Develop and implement community engagement strategies that addresses real and perceived fire risks of the Park	Implementation	Disagreement between workshop participants results in the delayed implementation of recommendations within the Plan	2	3	1	6	8.3
		Information provided to participants is not effectively delivered and/or is misinterpreted	2	1	2	5	
	Do-nothing	Community concern and frustration about perceived fire risk	4	1	4	9	
		Residents do not take responsibility for fire preparedness and prevention	3	1	5	9	
		Pressure on Council to address fire issues that are not actually risks	4	1	2	7	
Ongoing review and maintenance of the fire tracks	Implementation	Unnecessary removal of plant material along fire tracks (in excess of what is required for safety and fire removal)	2	3	1	6	
		Impacts on native vegetation and regeneration from contractors	2	3	1	6	

		Invasion of weed species into the areas where vegetation removed	3	2	1	6	
		Residents do not take responsibility for fire preparedness and prevention as they assume the maintenance of fire tracks does not put them or their property as risk from bushfires	2	1	4	7	6.3
	Do-nothing	Community and resident concern over fire risk	4	1	3	8	
		Inability of fire authorities to access critical areas needed if there is a fire	3	1	4	8	
		Endangers the safety of fire authorities	3	1	4	8	
		Community and residents view the Park unfavourably because of perceived fire risk/s	4	1	2	7	7.8
Ongoing communication with property owners to identify and address fire risk	Implementation	Misinterpretation or confusion over the information that has been provided	2	1	2	5	5.0
	Do-nothing	Property owners are unaware of fire risks and do not take action to prepare and prevent	4	1	4	9	
		Council is perceived as not providing the information that is required	3	1	2	6	7.5
Improve walking tracks to mitigate against off-track impacts and ensure visitor safety	Implementation	Targeted tracks for maintenance are not those most frequently used	1	1	3	5	
		Inappropriate use of materials to repair tracks	1	2	3	6	5.5
	Do-nothing	Injury to Park users	3	1	4	8	
		Disadvantages some users of the Park who do not feel safe on particular walking tracks	2	1	3	6	
		Reduced natural amenity value	3	1	3	7	
		Creating on new paths as walkers avoid track sections that are in need of repair	3	3	1	7	8.5
Improve the vegetation plantings within swales to prevent spread of weed species	Implementation	Unsuccessful plantings will reduce amenity value of the area	3	1	2	6	
		Perceived fire risk to adjoining property owners	3	1	2	6	
		Uncertainty about the likelihood of success as plant species will need to tolerate wet and dry periods	2	2	1	5	5.7
	Do-nothing	Reduces water quality entering the park as contaminants are not captured	3	3	1	7	
		Water movement is not slowed down causing erosion impacts within the Park	3	3	1	7	
		Serves as a repository of weed species that will likely invade the Park (and nearby properties?)	3	3	2	8	
		Current state is barren and has no amenity value	4	1	2	7	7.3
Maintain engineering structures (e.g. swales) to prevent erosion	Implementation	Invasion and spread of weeds and/or pathogens via contractors/equipment/machinery	2	4	1	7	
		High implementation cost that cannot be sustained	2	1	1	4	5.5

	Do-nothing	Reduces water quality entering the park as contaminants are not captured	3	3	1	7	6.7
		Water movement is not slowed down causing erosion impacts within the Park	3	3	1	7	
		The stability and safety of core walking tracks is compromised	2	1	3	6	
Develop a cultural burn procedural/best-practice document in partnership with Kurna representatives	Implementation	Raises expectation by Kurna, community and residents which if not met, could result in disappointment and disengagement	2	1	3	6	6.7
		The development of the guidelines and document is rushed and does not meaningfully or effectively engage Kurna people	2	1	4	7	
		The guidelines and document is not governed and developed by the right people (it should be Kurna people)	2	1	4	7	
	Do-nothing	Implementation of burn fails to engage and harness the expertise of traditional owners and traditional burn practitioners	4	1	4	9	8.0
		Opportunity loss of learning about country and land management	3	1	3	7	
		Opportunity loss of providing community and park users with a better appreciation and understanding of Kurna connection to land	3	1	4	8	
Ongoing monitoring and reporting on the condition of the heritage assets within the Park	Implementation	Resourcing and staff could be doing other core work as outlined in this Plan	2	2	1	5	5.0
	Do-nothing	Historical and heritage knowledge loss	2	2	1	5	5.7
		Inability to be responsive to emerging issues as they are not detected	3	2	1	6	
		Removal or vandalism of heritage assets is unnoticed and continues to deteriorate	3	1	2	6	
Convene a Wadmore Park Stakeholder Group that represents all stakeholders and meet twice/year	Implementation	Distracts from core on-ground work normally undertaken by stakeholders	2	2	2	6	5.5
		Ambiguity regarding the purpose and governance of the stakeholder group	3	1	1	5	
	Do-nothing	Potential for work to be undertaken within silos	3	2	2	7	7.0
		Loss of value-add opportunities and maximising effectiveness via reduced duplication of effort	3	2	2	7	
Ongoing monitoring of the biodiversity assessment quadrats and share results	Implementation	Too much emphasis placed on monitoring and less on doing	1	2	1	4	4.5
		Methodology is not repeated and/or assessors are not appropriately skilled, so the identification of trends is difficult	2	2	1	5	
	Do-nothing	Any biodiversity changes are not detected within the timescale for effective response	2	3	1	6	6.3
		Inability to correlate positive biodiversity outcomes with specific strategies and actions	3	2	1	6	
		Inability to be responsive to emerging issues as they are not detected	3	3	1	7	
Organise and host a Wadmore Park Field day with other Landcare groups to share learnings	Implementation	Resources and time could be otherwise allocated to delivery of other core work that is focussed on the Park	2	2	1	5	

		Additional "foot traffic" within the Park in sensitive areas	3	4	1	8	6.5
	Do-nothing	Opportunity loss of building the community of practice	3	1	3	7	
		Opportunity loss to showcase work undertaken by Council and the Landcare Group which could mean that other groups duplicate work or not be able to implement new approaches	3	2	2	7	7.0
Use the priority matrix to rank key activities and investments	Implementation	Using this process could reduce flexibility to undertake emerging priorities	1	2	1	4	4.0
	Do-nothing	Resourcing and budgets are not put into the priority work areas	2	2	1	5	
		Ineffectiveness and inefficiencies	3	1	3	7	
		Conflicting and competing priorities about what work needs to get done when	3	2	2	7	6.3
Develop a Monitoring, Evaluation and Reporting framework	Implementation	Distracts efforts from doing and implementation	1	3	1	5	
		If undertaken within a short-time frame, the results could be misleading and not indicative of potential benefits	3	2	1	6	5.5
	Do-nothing	Inability to identify effectiveness and value of work	3	1	2	6	
		Unable to report on funding and investment efficacies	4	1	2	7	6.5