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Knox City Council

Koolunga Native Reserve **Future Directions Plan**

JULY 2023

Acknowledgement of traditional land owners

Knox City Council acknowledges the Wurundjeri Woi-wurrung people and Bunurong people of the Kulin Nation, the Traditional Custodians of all lands within Knox City Council, including Koolunga Native Reserve.

The Knox Aboriginal and Torres Strait Islander Community come from a variety of different Nations within Australia and Torres Strait, including the Traditional Custodians and Stolen Generation. As such we pay respect to all Aboriginal and Torres Strait Islander Elders, past and present, who have resided in the area and have been an integral part of the region's history.

Located at the foot of the Dandenong Ranges, Knox has many places of historic significance to the Kulin nation. Important cultural and historical sites within Knox hold both the traditional knowledge of the First Nations People and the traumatic stories of colonisation.

The journey ahead for Knox involves the land, the traditional custodians, the local Indigenous community, the wider community and the Council itself. Walking together and listening together to create a culturally safe and culturally rich community for all.

Community Vision 2031

"Knox: where we connect with our people and our environment, ensuring they are safe, supported and have every opportunity to thrive."

Introduction

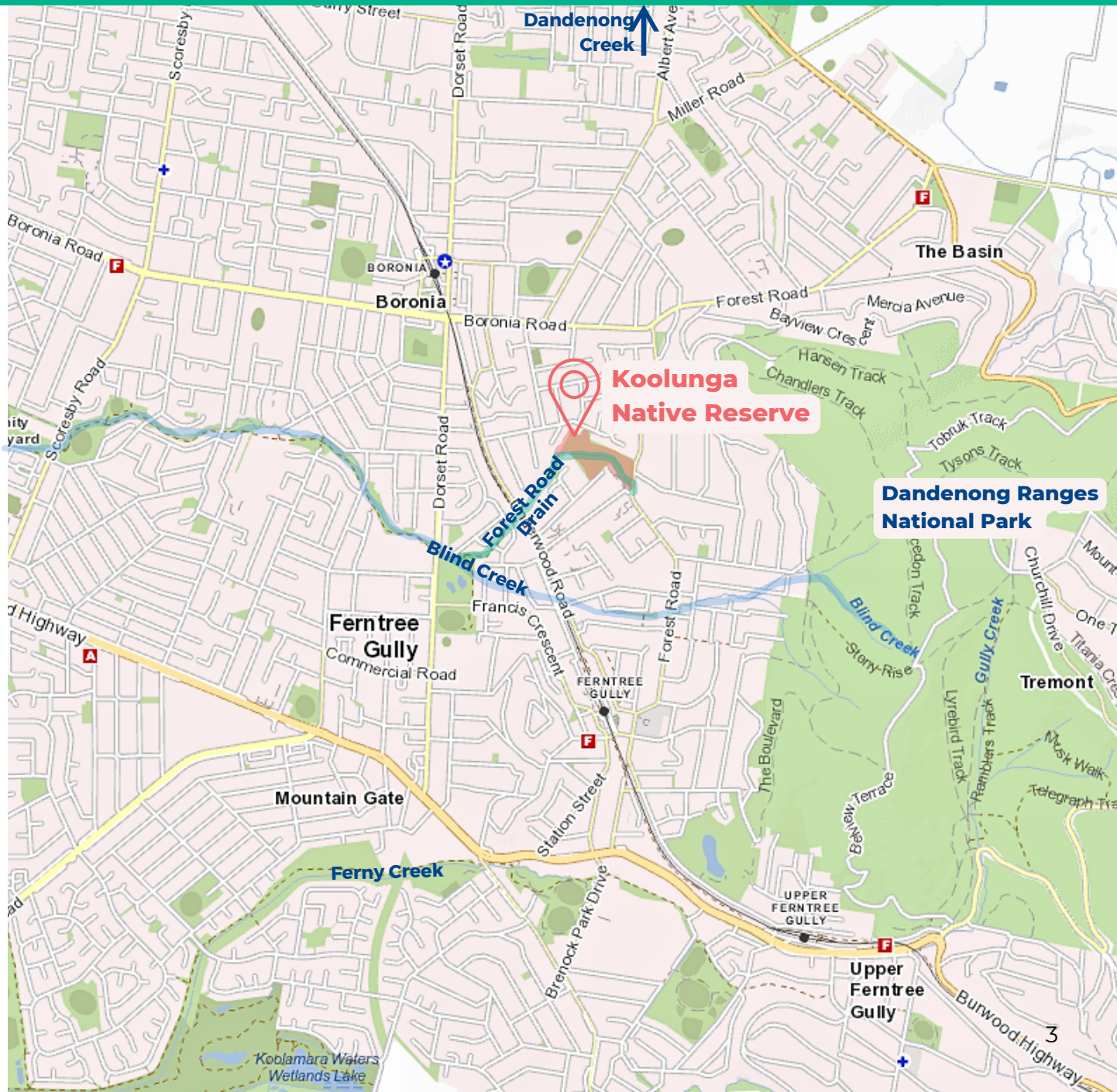
Koolunga Native Reserve

Koolunga Native Reserve is a 6 hectare reserve located in Ferntree Gully on the foothills of the Dandenong Ranges and is located on Wurundjeri land.

It is a 'Site of Biological Significance', one of the top 10 sites in Knox, with over 60% of the reserve being 'remnant bushland'. The site hosts a variety of native flora and fauna including significant and threatened species.

There is an open watercourse that flows through the site, into Blind Creek and later into Dandenong Creek and two kilometers of walking tracks wind through the reserve with two bridges across the watercourse.

The Reserve is highly valued by the local community due to it's environmental significance and opportunities for passive recreation.



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Project Purpose

Koolunga Native Reserve is well used and highly valued by the local community. Whilst Council along with the Friends of Koolunga have been working diligently to preserve and enhance the natural environmental to protect biodiversity, there has been growing concerns about the management of the waterway that runs through the site (Forest Road Drain). These concerns relate specifically to erosion created by stormwater events and the level of pollution in the creek.

Council's proposed plans to introduce a wetlands to improve stormwater in 2018 were not supported by some community members and Council has taken this feedback on board and committed to considering the future directions of the Reserve more broadly, including improved outcomes for the environment and community health and wellbeing.

This document consolidates and draws conclusions from technical studies and community engagement activities which have been carried out over the last couple of years to better inform Council and the community, before establishing future directions. These include -

- Koolunga Native Reserve Values Plan November 2022
- Koolunga Native Reserve and Vaughan Reserve Bushland Management Plan 2022
- Koolunga Stormwater Quality Study 2023

This Future Directions Plan provides clear direction for the protection and future development of Koolunga Native Reserve.

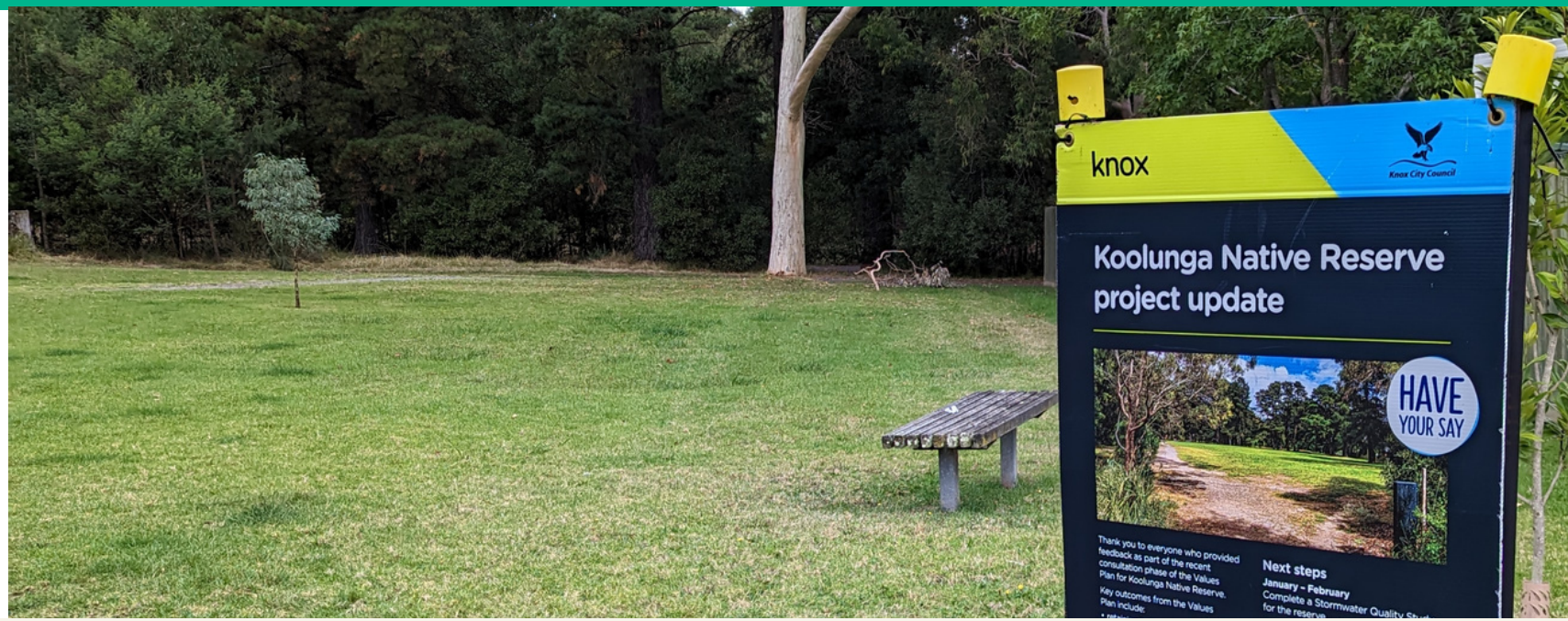
Introduction

Timeline

This Plan responds to a timeline of activities undertaken to improve the Reserve, dating back to 2018.

Over the last 5 years, Council has worked consistently to better understand the local environment including community values and priorities.

An outline of the timeline is shown below.



Late 2018
Koolunga Reserve identified as a potential site for wetland

Feb 2019
Exploratory Discussions with Friends of Koolunga & biodiversity consultant

Late 2019
High level concept plan developed
Funding secured from Melbourne Water

Feb-Apr 2021
Community engagement on wetland design

Oct 2021- Jan 2022
Values Plan developed following mixed reaction to wetlands proposal. Focus groups & survey to understand values.

May 2022
Draft Values Plan community feedback (site walk & survey)

Dec 2022 - Mar 2023
Development of technical reports:
Bushland Management Plan
Stormwater Quality Study

Feb - Apr 2023
Development of DRAFT FUTURE DIRECTONS PLAN

Apr-May 2023
Community feedback on DRAFT FUTURE DIRECTIONS PLAN

July 2023
Finalised FUTURE DIRECTIONS PLAN Endorsed by Council

Introduction

Strategic Context

The Knox City Council Community Plan 2021-2031 and Council Plan 2021-2025, provide strategic context for the future of Koolunga Native Reserve.

These key strategic documents are based on the community's needs and aspirations, and work together to inform all of the planning and decisions, guiding the future of Knox.

The proposed Future Directions for the Reserve align with the Community Plan key directions (below).

Knox Community Plan Key Directions

Natural environment and sustainability

Knox's natural environment is protected and enhanced to ensure sustainability for future generations.

- Increased tree canopy cover
- More diversity in flora and fauna.

Connection, resilience and wellbeing

Knox is a place to call home. Our community is strong, healthy and we support and respect each other.

- A more active community.
- People feeling safe and secure in the community.
- Increased sense of being valued and sense of empowerment.

Neighbourhoods, housing and infrastructure

Building on what's great about our city, Knox's housing and infrastructure will meet the changing needs of our community.

- Making sure our buildings and community spaces are inclusive and accessible.

Civic engagement and integrity

Knox Council is a trusted and respected leader in our community, acting appropriately and ensuring all voices are heard.

- All voices, not just the loudest ones, need to be heard, listened to and acted on, in an open and respectful way

Planning Context

Koolunga Native Reserve is zoned 'Public Park and Recreation Zone' with the purpose *to recognise areas for public recreation and open space, protect and conserve areas of significance where appropriate to provide for commercial uses where appropriate*.

The Reserve also has several overlays which restrict development based on its environmental significance:

- Environmental Significance Overlay (42.01)
- Schedule 2 to Clause 42.05 Sites of Biological Significance
- Significant Landscape Overlay (42.03)
- Schedule 3 to clause 42.03 Dandenong Foothills: lower slope and valley area
    - The Dandenong Foothills area is a visually sensitive area due to its proximity to slopes of the Dandenong Ranges which are recognised by the National Trust as a significant landscape.

Any future direction actions will need to comply with the Knox Planning Scheme and be sensitive to it's unique landscape qualities and location.

Catchment Context

Koolunga Native Reserve is located at the foothills of the Dandenong Ranges National Park and is one of the early catchments for Blind Creek and later the Dandenong Creek.
These both flow through Knox and further south east and provide a key wildlife corridor linking the national park through suburbia.
Figure 2, below illustrates the significance of it's location within the broader Dandenong Creek catchment.

Figure 2 -Koolunga Native Reserve within the Dandenong Creek catchment

Adapted from Melbourne Water, Know your river: Dandenong Creek Map

Introduction

Reserve Functions

Neighbourhood Conservation Reserve

Koolunga Native Reserve is a 'neighbourhood' open space within the broader Knox open space network.

"Neighbourhood open spaces are large parks that are used by a suburb scale catchment. They can accommodate multiple users and types of activities. They should have some special features unique to the suburb. These open spaces have place based relationship involving immediate family, neighbours and friends. "

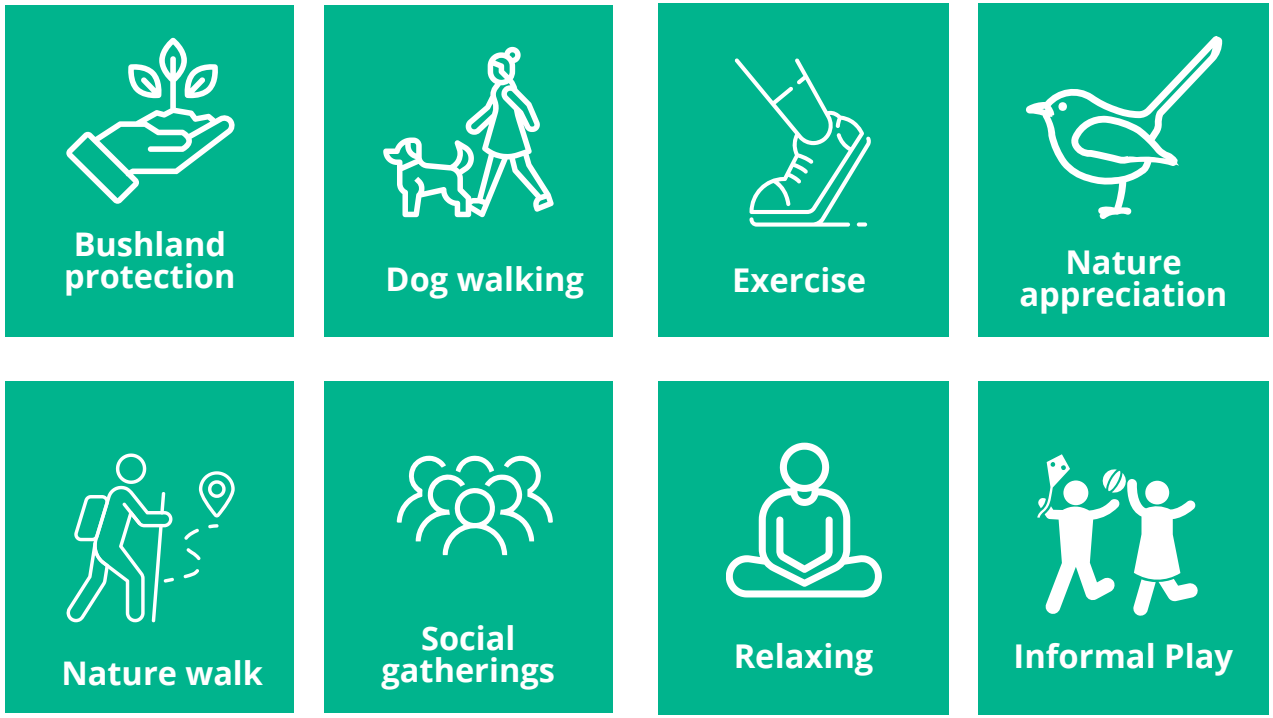
Open Space Plan 2012-2022

It's primary function is as a conservation reserve. Conservation reserves feature significant natural heritage areas, where fragments of the pre-European ecosystem have been preserved and reinvigorated.

Areas of Koolunga Native Reserve are identified as having National Biological Significance due to the presence of critically endangered flora and regionally significant habitat. It is also locally significant due to it's position on the local habitat corridor.

Core Activities

Identified via community engagement for the Values Plan



Environmental Significance

Koolunga Reserve provides critical habitat and breeding options for over 50 recorded bird species. Other important animals include two frog species, galaxias fish, short-finned eels, echidnas, sugar gliders and a large range of insects and water bugs. The site is environmentally significant for the following reasons:

- contains endangered, threatened and rare plant species
- rich levels of biodiversity with over 150 indigenous plant species
- provides prey and roost sites for some Powerful Owls (listed as Vulnerable in Victoria), whose large home ranges include the neighbourhood; and
- two migratory native fish species (Shortfin Eel and Broadfin Galaxias) live in the creek that flows through the reserve.

Cultural Heritage

Knox City Council, located at the foot of the Dandenong Ranges, possesses places of historic significance to the Kulin nation.

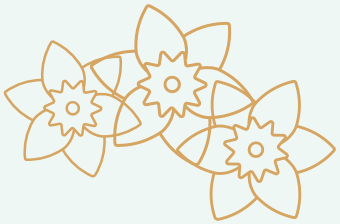
Important cultural and historical sites within Knox hold both the traditional knowledge of the First People and the traumatic stories of colonisation. Cultural sites in Knox include campsites, stone tools, scar trees and travelling routes or songlines.

Koolunga Native Reserve is located in close proximity to both the Dandenong Rages and Blind Creek, both areas of cultural sensitivity.

Local History

The Chandler Boronia and Daffodil Farm operated in Boronia from 1898 to 1971 and was for many years the largest daffodil farm in the southern hemisphere (over 100 acres). The rows of daffodils were bordered by boronia plants with rows of pines (Pinus radiata) as windbreaks separating the flower-growing fields.

The existing pine trees are landscape features that reflect and pay respect to the original landscape features and history of the farm, particularly in the eastern end of the reserve. This area contains rows of pine trees (from 50 to 65 years old), bordering paddocks that were used for daffodil growing.



Roles & Responsibilities

Group	Role at Koolunga Native Reserve
Council	Plan for, fund and maintain the Reserve including the drainage systems and for flood mitigation. Fund and support Friends Group. Land ownership and administration, including the Knox Planning Scheme.
Melbourne Water	Waterway manager and referral authority for works within the Reserve that may impact on the waterway.
Friends of Koolunga	Care for the bushland areas and creek line on a volunteer basis. Including weeding, replanting and pest control in collaboration with Council.
State / Federal Government	Referrals / assessments & approvals • Planning Scheme Amendments • Administer Environment Protection and Biodiversity Conservation Act

Community Groups

There are several community groups with interests regarding the future of the Reserve and have made significant contributions to to planning for the reserve to date.

Friends of Koolunga

A local volunteer group, established in 1994, focusing on positive environmental and community outcomes across the entire area of the Koolunga Native Reserve. Volunteers work throughout every month to preserve and enhance the unique flora and fauna of Knox via hands-on activities, community engagement and education, and other projects supporting biodiversity.

The group advocates for biodiversity values to Council, State government, federal government. Their work is supported by Council management and resourcing, and they also apply for grants to improve the biodiversity of the site. The group also assists Council at the nearby Wirrianda Reserve and Vaughan Reserve, and provides volunteers to facilitate Council-led community activities.

To assist in educating the community the friends host educational walks through the site in partnership with scouts and school groups. Citizen science programs and university partnerships support ongoing monitoring and research efforts.

Knox Environment Society

The Knox Environment Society engages in a number of projects and activities that monitor, protect and enhance the environment and has advocated for Reserve since the 1980's*

Stewards of Koolunga

The Stewards of Koolunga are a group of local residents formed in 2021 in response to the planned wetland in Koolunga Reserve. The Stewards have compiled a report** detailing the connection to the history of the Chandler Boronia and Daffodil Farm at Koolunga Reserve.

**2022 Bushland Management Plan for Koolunga Native Reserve and Vaughan Road Reserve*
*** Stewards of Koolunga Connection to the history of the Chandler Boronia & Daffodil Farm at Koolunga Reserve*

Consultation Outcomes

There have been numerous opportunities for community input into the future directions of the Reserve over the project's history.
Priorities identified by the community during the values plan initiative are shown to the right.

The high levels of engagement show that the reserve is well used and enjoyed by the local community and that there is a strong sense of ownership.

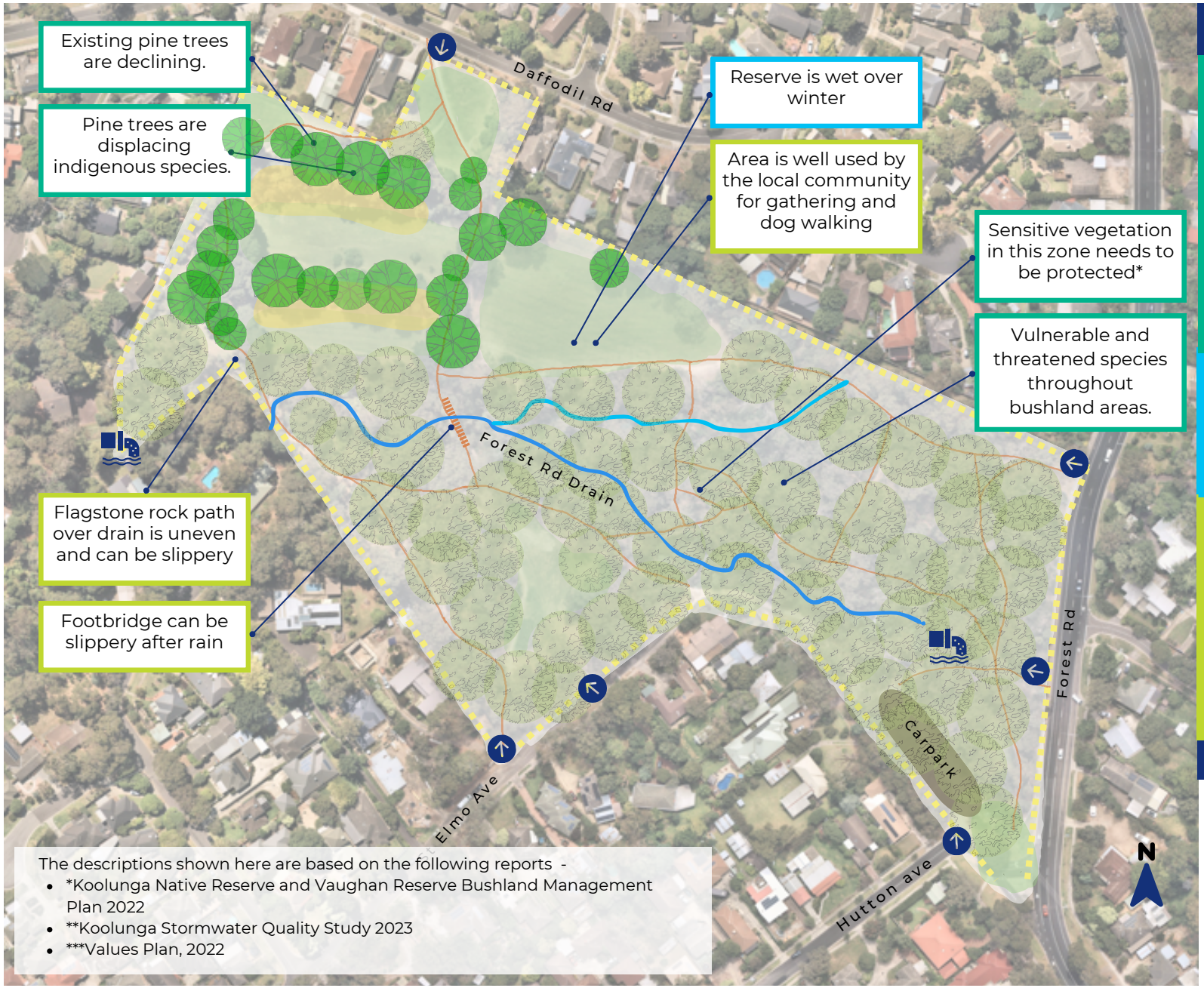
Along with a strong sense of ownership, comes divergent views and expectations often based on personal use, requirements and personal values. While most stakeholders value the natural bushland, there has been some contrast between those who have a preference towards future directions that prioritise conservation and protection, and those who primarily value access to a peaceful open space setting for recreational and social activity.

> *"You told us you value all the bushland areas, nature reserves, parks, reserves and waterways that Knox has to offer. During the COVID-19 pandemic, many people found a strong connection with nature. We need to continue to protect and enhance our waterways, bushland, nature reserves and parklands, so they will be there for generations to enjoy. We need to find the balance of being able to enjoy these spaces without damaging the natural habitat of our native bird, wildlife and plant species."*
>
> Community Vision 2021 Aspiration

Community Priorities

- **Highlight existing nature and biodiversity**
- **Retain bushland and open spaces**
- **Accessibility wayfinding and parking**
- **Improve water quality**
- **Create a maintenance plan**

Existing Conditions and Challenges



The descriptions shown here are based on the following reports -

- *Koolunga Native Reserve and Vaughan Reserve Bushland Management Plan 2022
- **Koolunga Stormwater Quality Study 2023
- ***Values Plan, 2022

Existing conditions and challenges

- Vulnerable and threatened plant species need to be protected*
- Death of stream life such as fish and invertebrates when the watercourses run dry or after large rain events due to intensity of water flow**
- Ecological decline of the vegetation due to the drying climate, depth of the water table unnaturally high populations of possums*
- Friends of Koolunga provide many hours of volunteer assistance and are highly valued*
- Existing environmental education signage is in need of renewal*

- Water quality is poor - water pollution, e.g. toxins, turbidity and excessive nutrients*
- Erratic stream flows with very high flows during rainfall events (causing erosion/damage) and no flow for extended periods**

- Lack of accessible seating in some areas and some furniture***
- Open grass areas are muddy throughout wet months**
- Bridges and rocky path areas may be unsafe after rain***
- Dog waste not collected and dog poo bags left on site*
- DDA compliant path is not connected throughout the reserve***

Legend

- Reserve entry/ exit point
- Existing Pine trees
- Existing trees
- Indigenous understory vegetation
- Forest Road Drain
- Existing trails
- Existing open space
- Stormwater outlet

4 Future Directions

Objectives

Protect and enhance Koolunga Native Reserve now and into the future to provide healthy outcomes for the local community and the environment by managing the reserve to achieve the following outcomes:

- Protect the ecological biodiversity and habitat values of the land
- Better manage stormwater to improve water quality
- Continue to welcome the local community to enjoy the natural environment and improve their health and wellbeing

Stormwater Management Options

Better manage stormwater to improve water quality

What is stormwater management?
Stormwater which enters a waterway directly from the drainage system contains excess nutrients, chemicals, soils and other materials collected from the streets and properties within the catchment. These pollutants and inconsistent flows can impact the health of the waterway.

Effective stormwater management will ideally have the following outcomes -

- less contamination in the water (both from litter, sediment and excess nutrients) which will support overall ecosystem health
- divert excess stormwater flows into a dedicated location for filtration
- slowed and more consistent water flows across ground and in creek lines, especially after storm events which supports vegetation and habitat health and reduces erosion
- reduced likelihood of significant water pollution events

These outcomes can partially be achieved by slowing down the flow of water so that it has time to filter through the ground. This process is called biofiltration, which occurs naturally as water soaks into the ground, especially where there is vegetation to absorb water.

This process can be enhanced by installing an engineered biofiltration system such a raingarden or swale to collect the water in one area and filter it underground through layers of filtration material.

These systems can help mitigate the impacts of increased pollutant loads associated with urbanisation on the natural environment (particularly waterways). Water is filtered through soil and vegetation which physically filters, chemically binds, and biologically processes pollutants (e.g. suspended solids, chemicals, pathogens).

What is a Gross Pollutant Trap (GPT)?
Concrete filter structures which are installed underground at stormwater outlets to collect sediment and pollutant materials. When maintained and cleaned out regularly, GPTs reduce the accumulation of soil, rubbish, sediment and gravels in waterways, swales or raingardens.

What is a swale?
A swale is area for biofiltration which receives and directs stormwater from an outlet or drain, so that it can infiltrate into the ground.

What is a raingarden?
A more engineered version of a swale, a raingarden is designed to slow water flows and capture more nutrients than a swale. Raingardens have above ground and below ground elements. These areas feature native vegetation, rocks and logs to mimic a natural creek line with perforated collection pipe/s below layers of soils and gravels to filter the water. An impervious liner forms the base and helps to direct water flows.

What is a constructed wetland?
A series of densely-planted, man-made ponds that help improve water quality by storing, filtering and slowly releasing stormwater. Constructed wetlands mimic natural systems most closely and are typically larger and deeper than rain gardens.

Stormwater Management Options

What has already been considered?

In response to community feedback against a constructed wetland in the reserve, Council commissioned a Stormwater Quality Study to determine the best alternative outcome for the Reserve taking into account the relative environmental and recreation values. The recommendations in this report take into account the following summary.

Options Considered				
Treatment	**Treatment outcome**	**Pros**	**Cons**	**Recommendation**
Gross Pollutant Traps (GPTs) at the southeast and/or southwest outlets (which flow into Forest Road Drain directly)	A GPT at either of these outlets could each capture: • sediment (~ 30 tonnes/ year) • gross pollutants (~10 tonnes/year), nitrogen (~30kg/year) • phosphorous (~110kg/year).	Very effective at collection of large, non-biodegradable pollutants and litter. Small footprint, underground infrastructure which will not not reduce the amount of highly valued open space for recreation. A GPT at either of these outlets is expected to produce the best water quality outcomes compared to treatments the North outlet (proposed below).	Not considered very effective at removing nutrients from water, so will rely on the existing Forest Road drain for this treatment. Requires specialist contractors/machinery to extract captured sediments and litter. The South West catchment is the largest and most developed, but the location of the outlet is not feasible as it is not accessible for ongoing maintenance.	One GPT is recommended at the southeast drain outlet (nearest to Forest Road) as it is expected to provide good water quality outcomes when compared with the cost of installation and maintenance.
Vegetated Swale and GPT at North outlet (new above ground treatment in open space)	A GPT and swale is expected to capture: • sediment (~10 tonnes/ year) • gross pollutants (~2 tonnes/year) • nitrogen (~16kg/year) • phosphorous (~66kg/year)	Both the growing medium beneath, and the vegetation above, treat the stormwater as it passes through the system. The combination vegetated swale and GPT will remove some nitrogen, phosphorus, sediments and pollutants from the stormwater before it reaches the creek line.	Treatment without engineered filter media and under drains (which exist with raingardens) means the stormwater flows through the system faster allowing for more nutrients and other pollutants to pass through without being captured. The catchment of the North outlet is smaller than that of the south east and south west outlets, and is least developed. Therefore, a GPT and swale is expected to capture less sediment and pollutants, compared to a GPT at the other outlets.	Not considered good value for money (outcomes compared to cost of installation and management). However, vegetation (without a swale beneath, or GPT) is likely to have a positive impact on water management without the costs of installation and maintenance.
Linear Raingardens and GPT at north outlet (new above ground treatment in open space)	A GPT and raingarden system is expected to capture: • sediment (~10 tonnes/ year) • gross pollutants (~2 tonnes/year) • nitrogen (~16kg/year) • phosphorous (~70kg/year)	The engineered filter medium and under drains beneath and vegetation above make raingardens highly effective at removing pollutants from stormwater when compared to their overall footprint.	Raingardens are not as effective at holding and slowly releasing stormwater when compared to wetlands. Raingardens are also complex systems which are costly to construct and require a lot of maintenance to keep them operating as intended.	Not considered good value for money (outcomes compared to cost of installation and management)

5 Activities

Protect the ecological, biodiversity and habitat values of the land

Outcome		Activities	Implementation
Protect and enhance areas of significance and sensitivity from degeneration	1.1	Continue to (and enhance where possible) weed control within the reserve	Ongoing bushland management activities (guided by the bushland management plan)
	1.2	Strategic vegetation planting to: • protect vulnerable or threatened species, • fill gaps in the canopy • reestablish endemic species • increase vegetation on creek line banks to reduce erosion	Ongoing bushland management activities (guided by the bushland management plan)
	1.3	Provide learning and collaboration opportunities to the community, to support volunteers and the community in caring for and about the reserve.	Ongoing bushland management activities (guided by the bushland management plan)
	1.4	Acknowledging current faunal species usage of the mature pines. Plan for a staged removal of *Pinus radiata* throughout the reserve, including revegetation with appropriate indigenous species in consultation with Council's Biodiversity Team.	Ongoing bushland management activities (guided by the bushland management plan)
Control access to sensitive areas to protect the sensitive bushland	1.5	Close and revegetate the 20m-long connecting path parallel to the Forest Road Drain, 12 m northeast of the bridge near the dead end of St Elmo Av to protect the large number of rare native orchids	Park Upgrade Program (Capital Works)
	1.6	Design pathway edges to create a visual barrier between public access areas and bushland. Use logs, rocks and other natural features to direct access away from bushland areas	Ongoing bushland management activities (guided by the bushland management plan) Routine park operations activities
	1.7	Review fencing, remove any no longer required to leave only necessary fencing. Provide signage explaining fencing location and requesting that the area not be accessed	Ongoing bushland management activities (guided by the bushland management plan)
Educate the community about the environmental values of the Reserve	1.8	Refresh all environmental education and information boards to: provide clear and engaging information about the flora and fauna of Koolunga Native Reserve, recognise the role and work of the Friends of Koolunga Native Reserve within the Reserve and recognition of the Traditional Owner custodians of the environment.	Ongoing bushland management activities (guided by the bushland management plan)
	1.9	Engage with Melbourne Water and strongly encourage Melbourne Water to undertake community engagement on the renaming of the watercourse currently known as Forest Road Drain.	Park planning

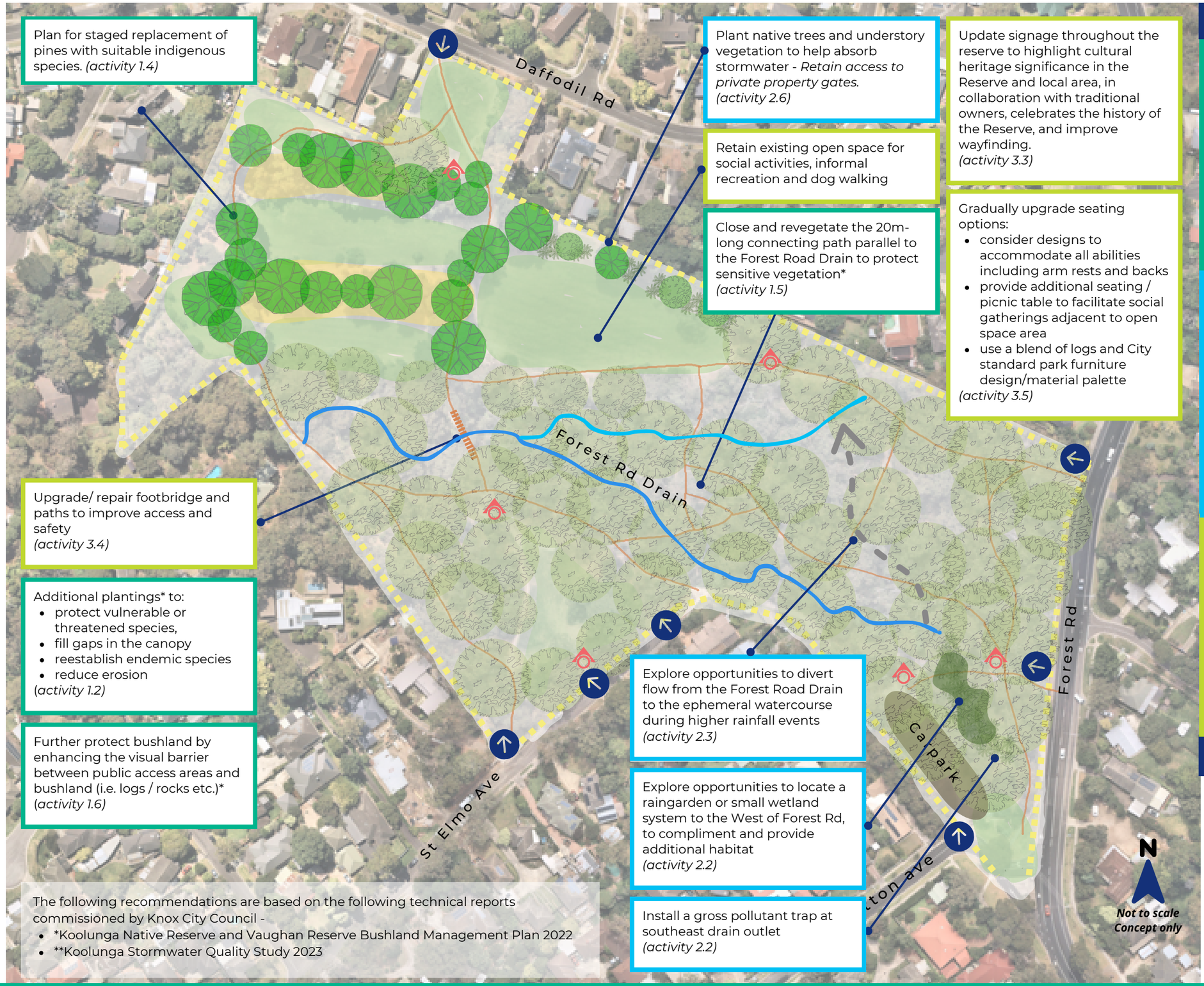
Better manage stormwater to improve water quality

Outcome		Activities	Implementation
Adopt improved stormwater management measures	2.1	In collaboration with Melbourne Water, seek to retain the $120k Living Rivers Stormwater Program funding to improve functionality of Forest Road Drain within the Reserve – with a view to slowing down the water flow, removing sediment, guiding weed removal, and revegetating with indigenous species.	Stormwater management capital works and ongoing bushland management activities (guided by the bushland management plan)
	2.2	Design and install a Gross Pollutant Trap (GPT) at the southeast outlet in the eastern section of the reserve with consideration for a bio filtration raingarden or small wetland system to the west of Forest Rd to compliment and provide additional habitat.	Stormwater management capital works
	2.3	Explore the possibility with Melbourne Water of diverting some of the flow from the Forest Road Drain to the ephemeral watercourse to help mitigate pulse flow issues in Forest Road Drain.	Stormwater management capital works
	2.4	Prepare a water management plan for the eastern Blind Creek catchment to improve outcomes catchment wide. Develop an educational campaign highlighting the impacts of pollution, illegal dumping and spills on the watercourses and work with the EPA to monitor and undertake enforcement activities.	Strategic planning (implementation and review of city-wide water management strategy)
	2.5	Consider adopting additional measures upstream to remove pollutants at source. This might include silt traps at bases of pits, trash racks, tree pits or smaller bioretention swales in road reserves.	Routine asset management works, asset management plan implementation and review
	2.6	Plant indigenous mature trees and understory vegetation along the northern fence line of the reserve. This vegetation will help to absorb stormwater entering the reserve from the north stormwater catchment.	Stormwater management capital works and ongoing bushland management activities (guided by the bushland management plan)

Activities

Continue to welcome the local community to enjoy the natural environment and improve their health and wellbeing

Outcome		Activities	Implementation
Improve resident and visitor safety	3.1	Maintain firebreaks and remove vegetation to reduce bushfire hazard	Ongoing bushland management activities (guided by the bushland management plan) Annual bushfire preparedness works
	3.2	Proactively inspect and manage trees to mitigate safety issues, and factors contributing to defoliation.	Ongoing bushland management activities (guided by the bushland management plan)
Improve visitor experience	3.3	Update signage throughout the reserve to highlight cultural heritage significance in the Reserve and local area, in collaboration with traditional owners, celebrates the history of the Reserve, and improve wayfinding.	Ongoing bushland management activities (guided by the bushland management plan) Routine park operations activities
	3.4	Repair / upgrade bridge and paths to improve access and safety. Investigate providing additional paths within the reserve (outside of the remnant vegetation area) where there are existing informal walking paths.	Ongoing park operations activities
	3.5	Gradually upgrade seating options: • Consider designs to accommodate all abilities including arm rests and backs • Provide additional seating / picnic table to facilitate social gatherings adjacent to open space area • Use a blend of logs and City standard park furniture design/material palette	Ongoing park operations activities
	3.6	Support responsible dog ownership by providing additional bins, education, and enforcement where necessary.	Ongoing park operations activities



Plan for staged replacement of pines with suitable indigenous species. *(activity 1.4)*

Upgrade/ repair footbridge and paths to improve access and safety
(activity 3.4)

Additional plantings* to:
- protect vulnerable or threatened species,
- fill gaps in the canopy
- reestablish endemic species
- reduce erosion

(activity 1.2)

Further protect bushland by enhancing the visual barrier between public access areas and bushland (i.e. logs / rocks etc.)*
(activity 1.6)

Plant native trees and understory vegetation to help absorb stormwater - *Retain access to private property gates.*
(activity 2.6)

Retain existing open space for social activities, informal recreation and dog walking

Close and revegetate the 20m-long connecting path parallel to the Forest Road Drain to protect sensitive vegetation*
(activity 1.5)

Explore opportunities to divert flow from the Forest Road Drain to the ephemeral watercourse during higher rainfall events
(activity 2.3)

Explore opportunities to locate a raingarden or small wetland system to the West of Forest Rd, to compliment and provide additional habitat
(activity 2.2)

Install a gross pollutant trap at southeast drain outlet
(activity 2.2)

Update signage throughout the reserve to highlight cultural heritage significance in the Reserve and local area, in collaboration with traditional owners, celebrates the history of the Reserve, and improve wayfinding.
(activity 3.3)

Gradually upgrade seating options:
- consider designs to accommodate all abilities including arm rests and backs
- provide additional seating / picnic table to facilitate social gatherings adjacent to open space area
- use a blend of logs and City standard park furniture design/material palette

(activity 3.5)

The following recommendations are based on the following technical reports commissioned by Knox City Council -
- *Koolunga Native Reserve and Vaughan Reserve Bushland Management Plan 2022
- **Koolunga Stormwater Quality Study 2023

Outcomes

Protect the ecological biodiversity and habitat values of the land
- Protect and enhance areas of significance and sensitivity from degeneration
- Control access to sensitive areas to protect the sensitive bushland
- Educate the community about the environmental values of the Reserve

Better manage stormwater to improve water quality
- Maintain the existing pipe network system for the broader catchment and plan for future upgrades
- Adopt improved stormwater management measures on site including a pollutant trap and strategic planting

Welcome the local community to improve their health and wellbeing
- Improve resident and visitor safety
- Improve visitor experience
- Retain and celebrate local history and cultural heritage

Legend

- Reserve entry/ exit point
- Existing Pine trees
- Indigenous understory regrowth
- New trees and understory vegetation
- Forest Road Drain
- Existing trails
- Existing open space to be retained
- Existing trees
- Indicative locations for updated signage

Koolunga Native Reserve

Future Directions Plan - July 2023

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Knox City Council

Knox City Council

emerge ASSOCIATES