

Bungambrawatha Creek - Action Plan

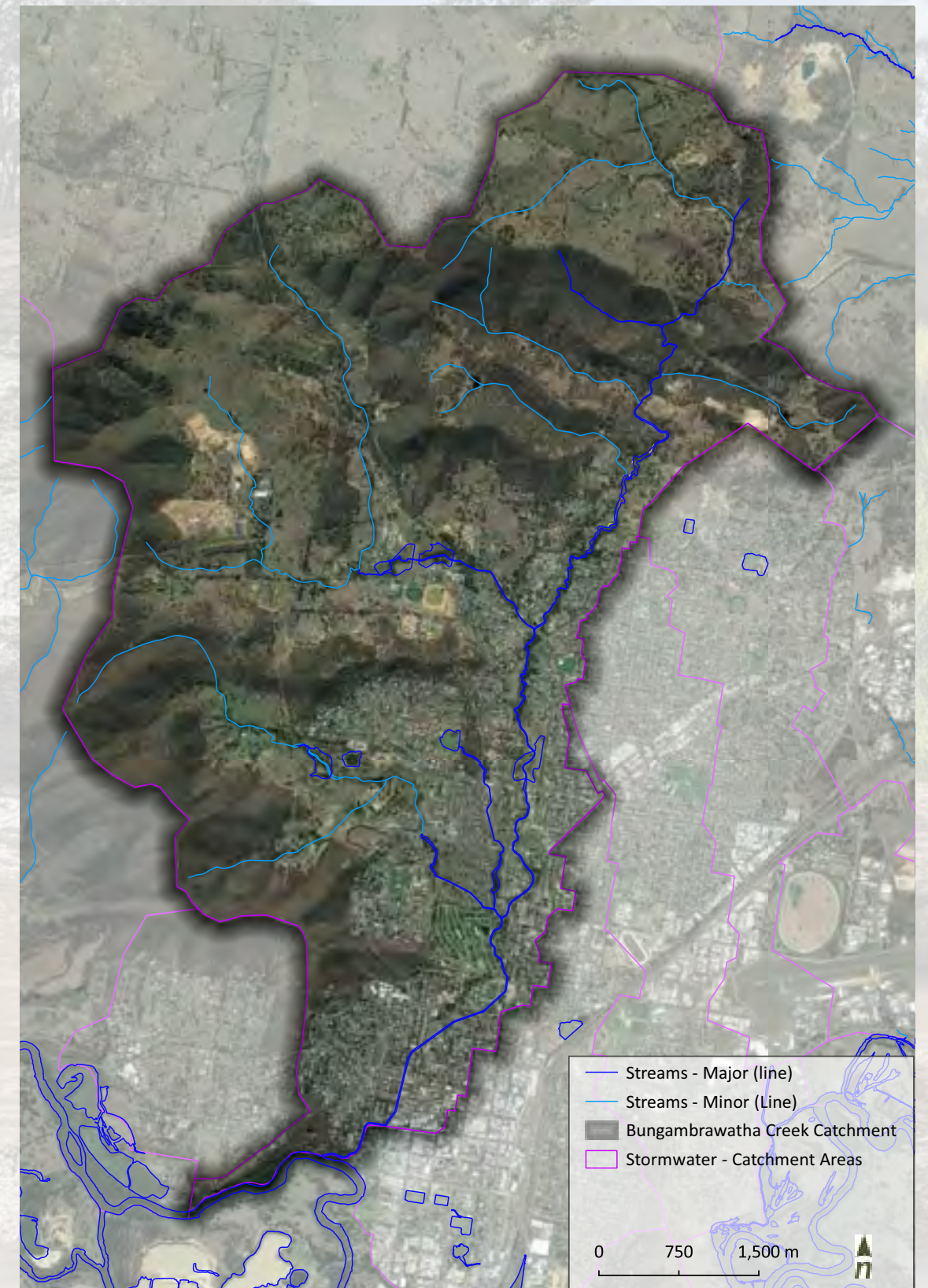
a multi-functional corridor

Vision

“The Bungambrawatha Creek corridor balances the competing interests of this highly constrained and modified area to create a multi-functional space that acts as a community connector, improves biodiversity and waterway condition, practices connection with country, and provides a positive contribution to the lives of those that live and recreate in and adjacent to the corridor.”

Originating in the Black Range to the north of the city, Bungambrawatha Creek flows through the Albury City CBD to its confluence with the Murray River. The creek flows through the traditional lands of the Wiradjuri people, taking its name, Bungambrawatha, from the name given to the area by the traditional owners, meaning ‘Homeland’. The catchment is over 40km² in area, encompassing the major tributaries of Hamilton Valley Creek, Little Black Springs and Black Springs Creeks. The waterway has been channelised over the course of the last century in what has until relatively recently been considered best engineering practice.

This action plan has been developed in recognition of a need to better manage the waterway and to improve its environmental and social value. The actions in the action plan respond to the needs of the community identified through consultation, a technical assessment of flooding, and the ecological, physical and social values of the waterway.



Objectives



Floodplain Management

The Bungambrawatha Creek corridor considers stormwater conveyance and resilience to flooding in all aspects of its design and management.



Activation and Connectivity

Bungambrawatha Creek connects the two CBDs and beyond via an active transport network that has appropriate lighting, is safe, cool, shaded, and scenic. The corridor is transformed from an unnoticed waterway to a linear hub of passive and active recreation along its length, connecting CBDs and communities to each other and the waterway.



Amenity

The visual amenity of Bungambrawatha Creek is improved through the enhancement and management of natural values and vegetation that is well integrated with the urban landscape.



Community

The community is connected to Bungambrawatha Creek, actively caring for and valuing the waterway as a place of beauty, biodiversity and recreation.



Water Sensitive Urban Design

Stormwater and excess urban flow within the waterway is actively managed to improve water quality and waterway health outcomes and to be recognized as a valuable resource to provide alternative water supply for irrigation of adjacent lands.



Ecology

Bungambrawatha Creek is an ecologically functional riparian corridor that provides connectivity and habitat for diverse native aquatic and terrestrial species assemblages.



Infrastructure

Infrastructure is appropriately considered in the Bungambrawatha Creek corridor, and opportunities for co-investment should be investigated.



Maintenance

All proposed activities within the corridor consider at all times the maintenance implications for Council, including cost, human resource requirement, safety and ability to carry out required maintenance activities.



Cultural Connection

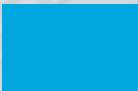
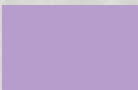
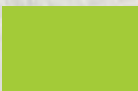
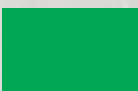
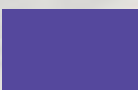
To be developed with Traditional Owners
Possible objective: The Bungambrawatha Creek corridor allows an opportunity for the Traditional Owners to connect with country as a living expression of their culture.

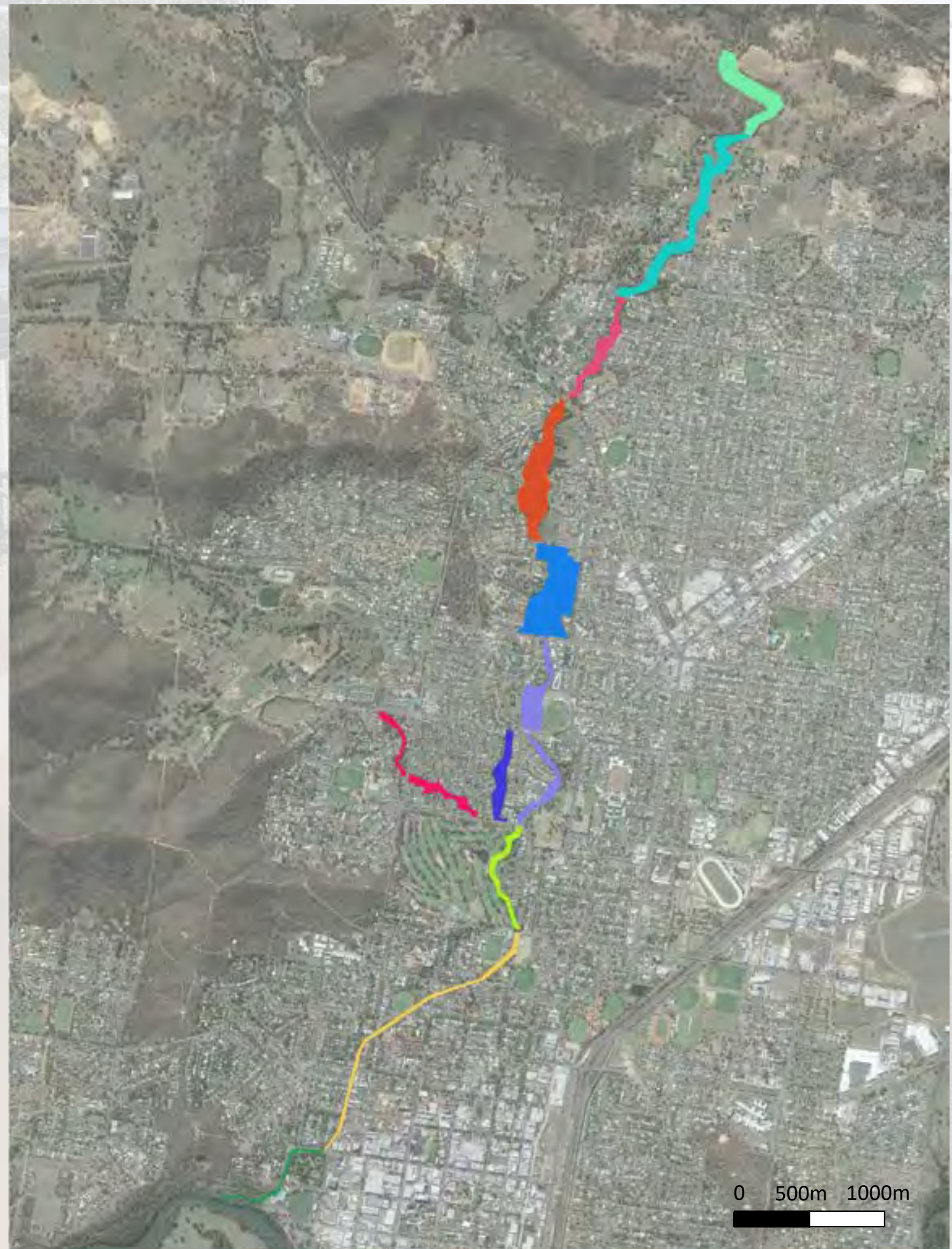


Channel form

Bungambrawatha Creek and its tributaries are stable in the unlined sections of the waterway, while opportunities to improve the natural characteristics and amenity of the waterway are explored through the concrete lined reaches.

Management Zones

-  Management Zone 1
-  Management Zone 2
-  Management Zone 3
-  Management Zone 4
-  Management Zone 5
-  Management Zone 6
-  Management Zone 7
-  Management Zone 8
-  Management Zone 9
-  Management Zone 10
-  Management Zone 11



Management Zone 1

Located in the mid to upper reaches of Bungambrawatha Creek, management zone 1 is relatively stable, despite historical disturbance and ongoing grazing access. Surrounding rural vegetation is characteristic of grassy box gum and typically grazed. Crown land surrounds the creek, which is used for informal recreation, and the zone is surrounded by privately and Council-owned parcels of land.

Key outcomes for the zone are to improve site **ecology**, monitor **channel form**, and improve **activation and connectivity**

Actions



Ecology

- 1 Weed management, revegetation and stock exclusion
- 2 Formalise access to prevent unauthorised activities



Activation and Connectivity

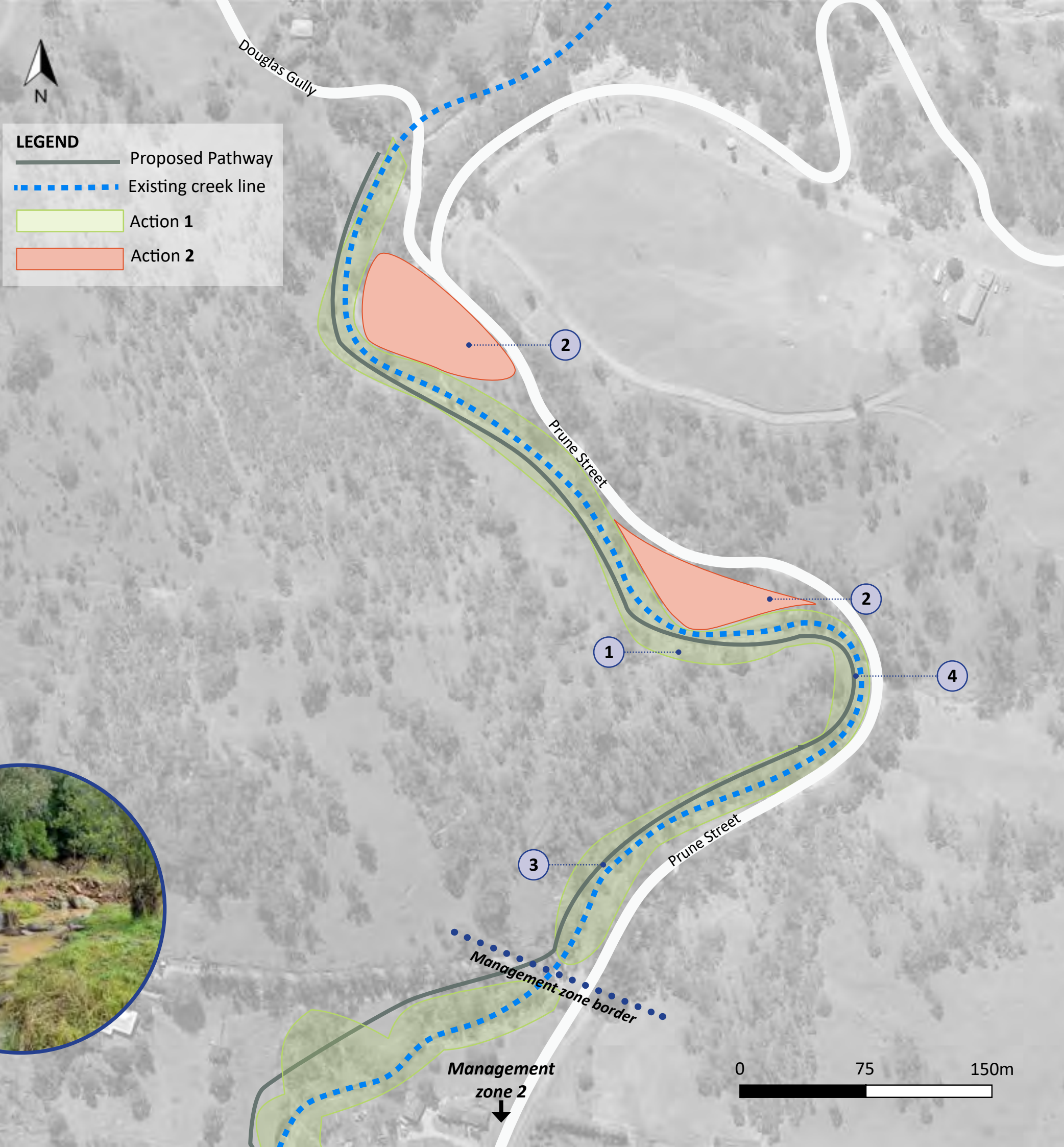
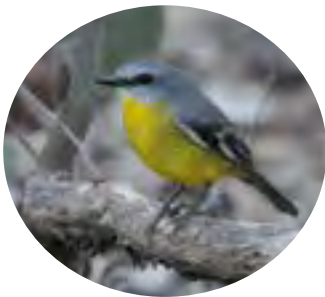
- 3 Bungambrawatha Creek Trail established with potential seating and interpretive signage points



Channel form

- 4 Monitor outer bend of waterway

Image of Eastern Yellow Robin
Photo source: Matthew Lincoln



Management Zone 2

The waterway in this reach has been subject to historical deepening and widening, and some channel migration continues with steep embankments being undercut by the waterway in upper reaches. Vegetation is a mix of quality remnant overstorey with grassy understorey, and some areas dominated by weeds including Privet and English Elm. The surrounding freehold land is a mix of Council and privately owned. Objectives for this reach revolve around improved ecology, stabilisation and maintainability.

Key outcomes include improving **ecology**, **channel form** and maintenance infrastructure

Actions



Ecology

- 1 Weed management and revegetation
- 2 Offline ephemeral wetland
- 3 Collaborate with landholders to undertake weed removal and revegetation
- 4 Undertake weed removal and revegetation on Council land



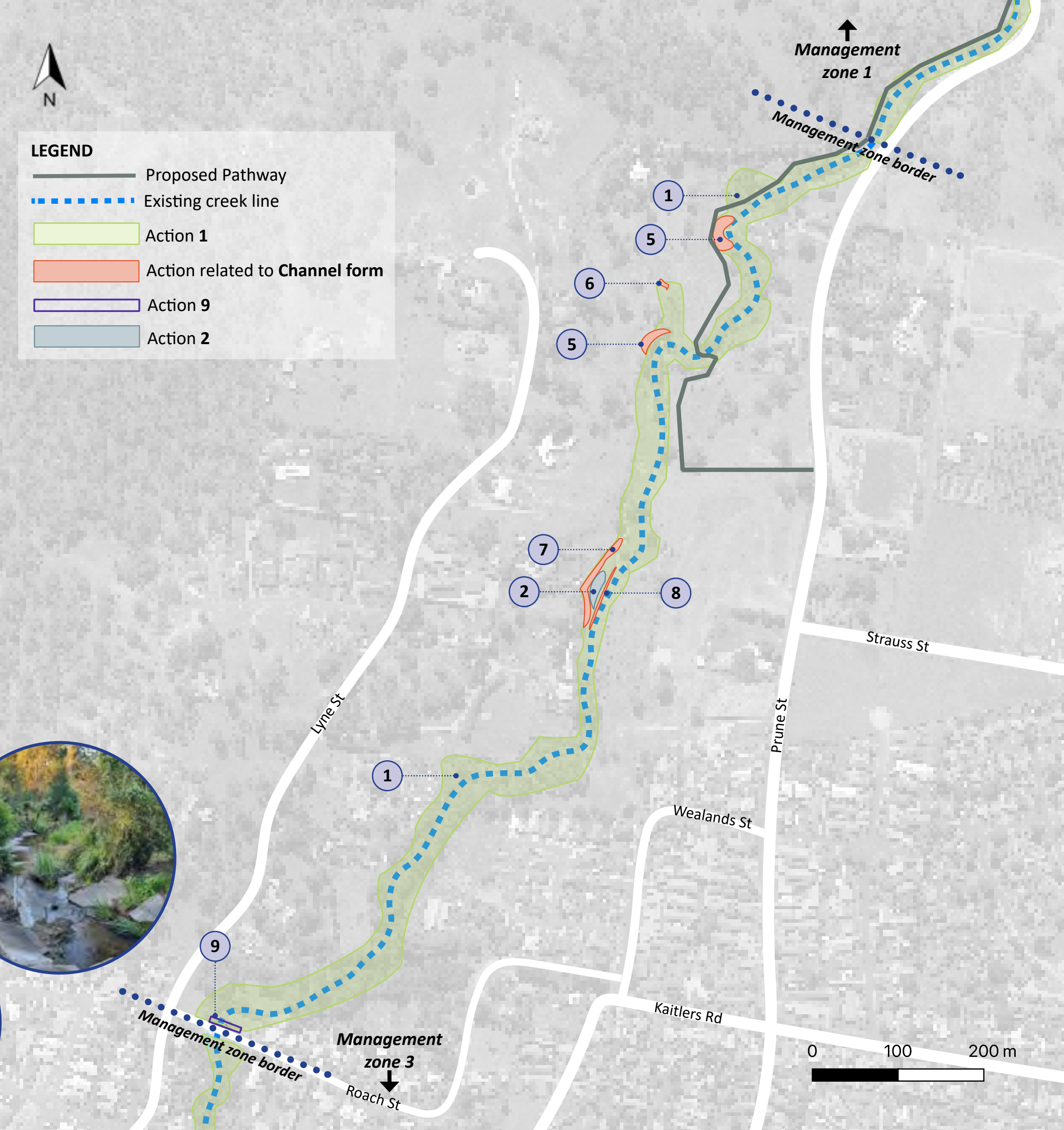
Channel form

- 5 Bank stabilisation
- 6 Headcut stabilisation
- 7 Toe of bank protection
- 8 Bund removal



Infrastructure

- 9 Improved maintenance accessibility



Management Zone 3

The waterway in this zone has been historically eroded, however is now largely stabilised by dense stands of exotic vegetation. Flooding is a significant concern of local residents who are regularly impacted by flood waters in the reach. Key outcomes sought for the zone are improved **ecology**, **channel form** and **community connection** to the waterway.

Actions



Ecology

- 1 Staged weed removal and revegetation on Council land
- 2 Collaborate with landholders to undertake weed removal and revegetation



Maintenance

- 3 Scour protection & maintenance access



Community connection

- 4 Develop MOU and partnership with school to improve waterway and aid access for maintenance works along creek line
- 5 Work with community to ensure no unlawful activities (dumping and filling in and adjacent waterway) that exacerbates flooding

Hamilton Valley Creek



Floodplain management

- 5 Investigate cumulative impact of development on flooding on Bungambrawatha Creek
- 6 Investigate improved performance of Collins St Basin for flood retardation



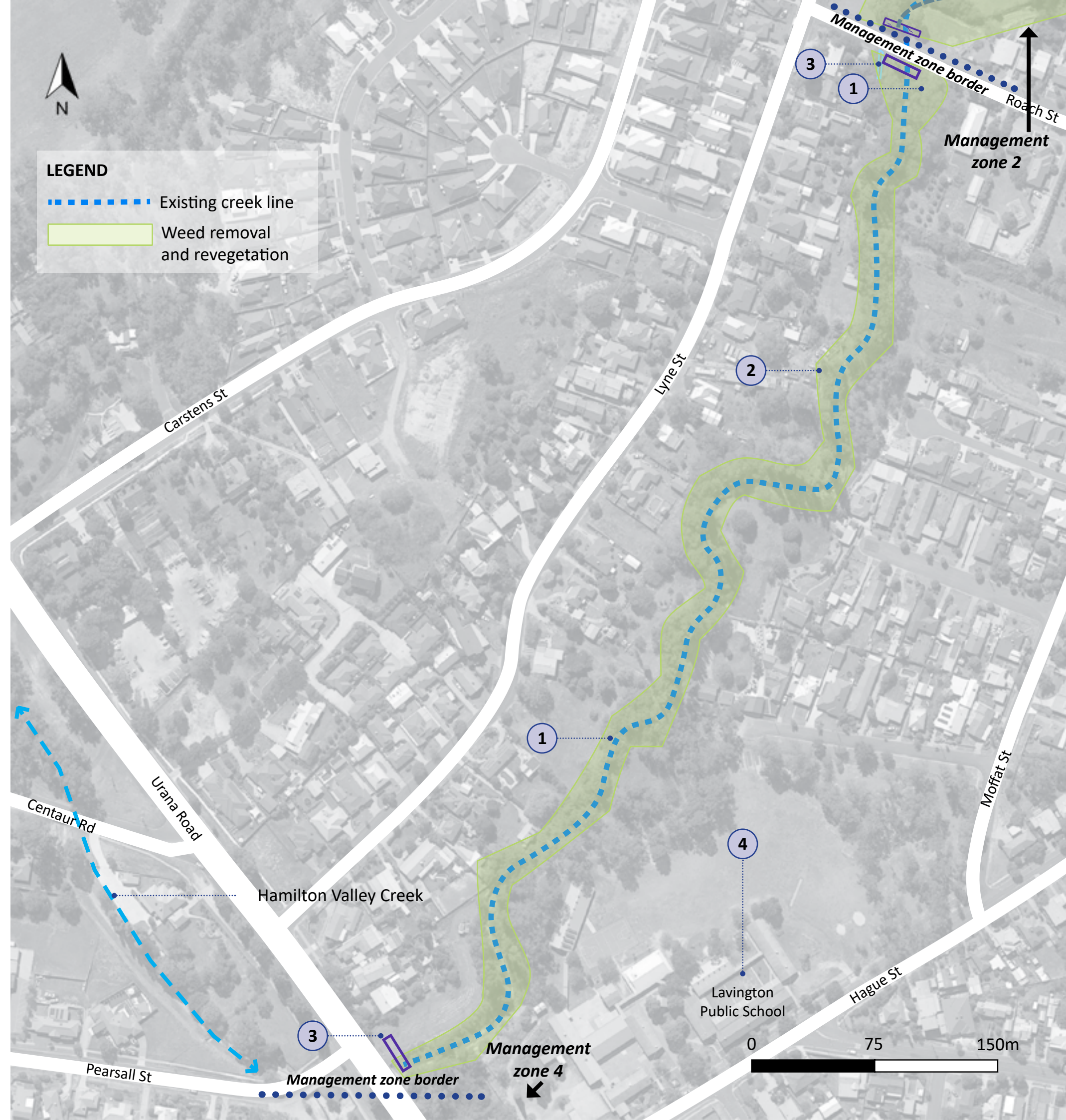
Water sensitive urban design

- 7 Development compliance for flooding, WSUD and erosion control
- 8 Erosion and sediment control compliance



Community connection

- 9 Collaborate with landholders to improve waterway stability and improve Council access to the creek for maintenance



Management Zone 4

This zone encompasses Heathwood Park, and is immediately downstream of the confluence of Bungambrawatha Creek with Hamilton Valley Creek. Riparian vegetation on the west bank within Heathwood Park is in good condition, having benefited from community revegetation effort, whilst on the east bank quality remnant trees (River Red Gums) remain, but exotic species dominate in private land. The Bungambrawatha Creek trail commences at Urana Road, and has poor shade coverage through Heathwood Park.

Key outcomes for the zone are to enhance **ecology**, improve the **amenity** of Heathwood Park and useability of the shared path (**activation and connectivity**) through the provision of shade trees and explore opportunities for **water sensitive urban design** for water quality and amenity improvement.

Actions



Ecology

- 1 Ongoing weed management and revegetation as required
- 2 Re-establish a Friends of Bungambrawatha Creek to maintain and extend community planting
- 3 Collaborate with landholders for weed removal and revegetation



Amenity

- 4 Overstory planting to create shaded pathway



Water sensitive urban design

- 5 Constructed wetland

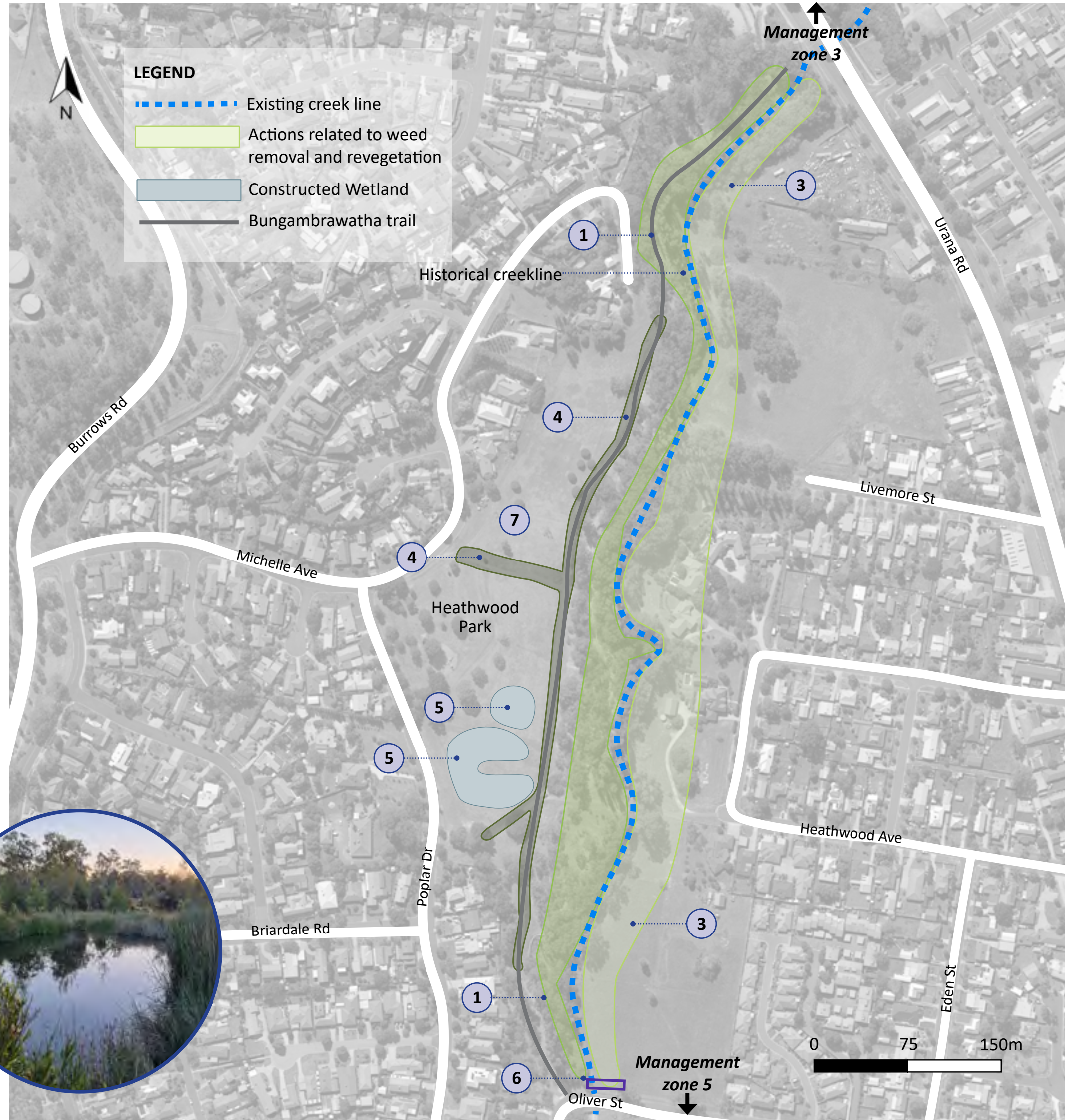


Maintenance

- 6 Maintenance access

All objectives

- 7 Heathwood Park masterplan to ensure integrated and planned outcomes.



Management Zone 5

The Union Road retarding basin dominates this zone, playing an important flood retardation role that protects the Albury City centre from flooding. It is the first section of concrete lined channel, which meanders through remnant vegetation.

Key outcomes are to improve **ecology** and **channel form** through naturalisation, provide improved **activation and connectivity** and investigate enhancements to infrastructure performance.

Actions



Ecology

- 1 Investigate channel naturalisation aligning with typology 6
- 2 Offline ephemeral wetlands for improved habitat opportunities
- 3 Weed control and revegetation on Council land



Floodplain management

- 4 Opportunity to increase retarding basin capacity to reduce downstream flooding



Activation and connectivity

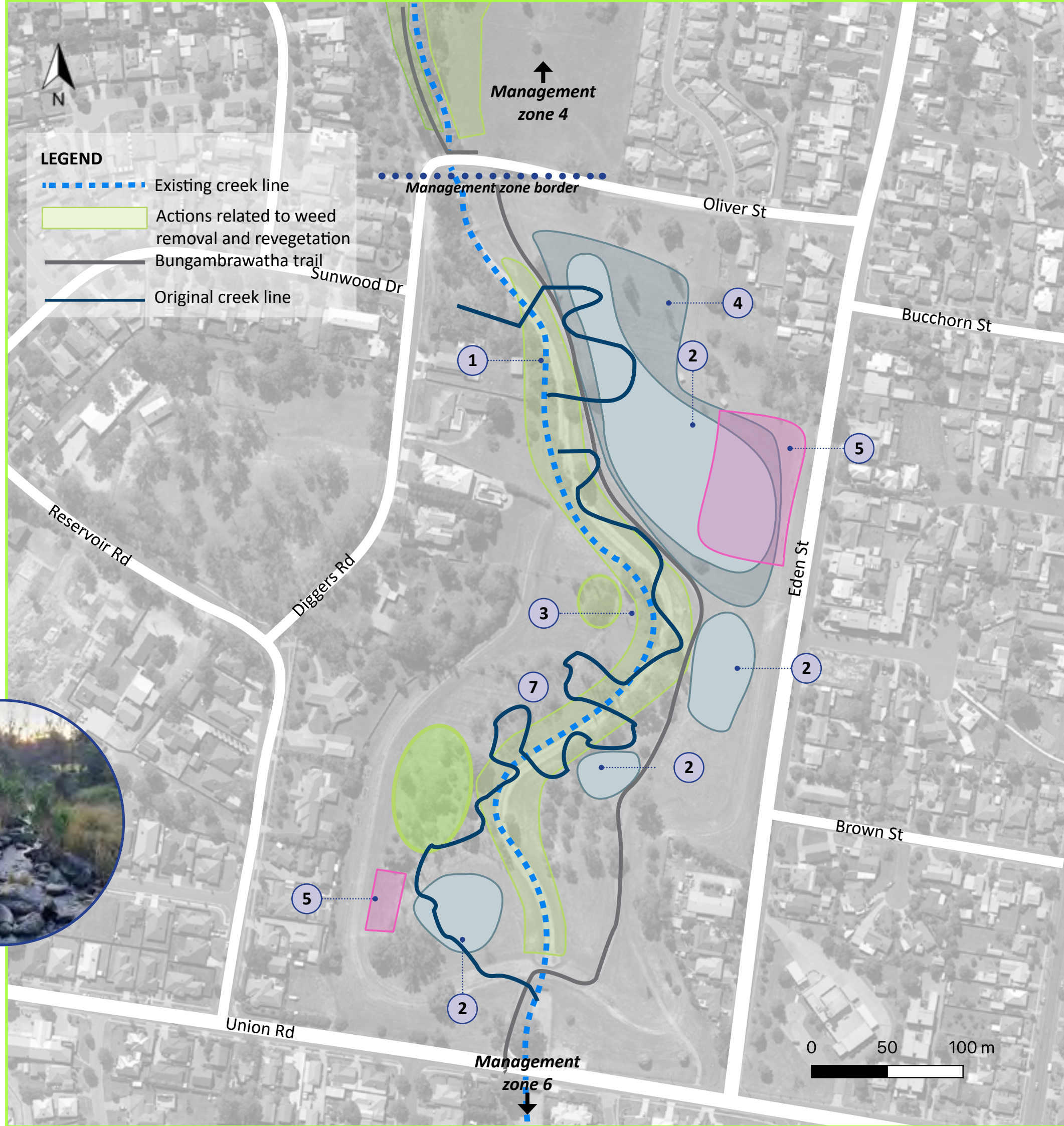
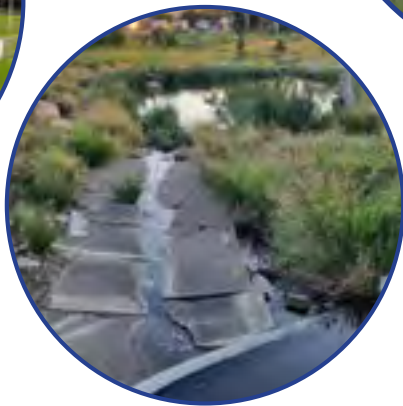
- 5 Investigate multi-use open space areas
- 6 Informal kickabout spaces provided

All objectives

- 7 Union Road basin masterplan



Greenfield Park (sports field)
Photo source: AlburyCity website



Management Zone 6

Encompassing Frederick Park, this zone is concrete lined. Some areas of remnant River Red Gums line the waterway with areas of quality grassy understorey, particularly through Frederick Park. The Bungambrawatha Creek trail generally has good shade cover, and while in a tightly confined corridor (excepting Frederick Park) has a reasonable linear corridor.

Zone intent is to investigate naturalisation opportunities improving **channel form** and improved **ecology** and **amenity** through improved channel-side vegetation management and by adopting **water sensitive urban design**.

Actions



Ecology

- 1 Weed management and revegetation
- 2 Low flow directed to naturalised channel
- 3 Offline ephemeral wetlands for improved habitat opportunities



Water sensitive urban design

- 4 Swale planting to improve water quality and habitat diversity



Amenity

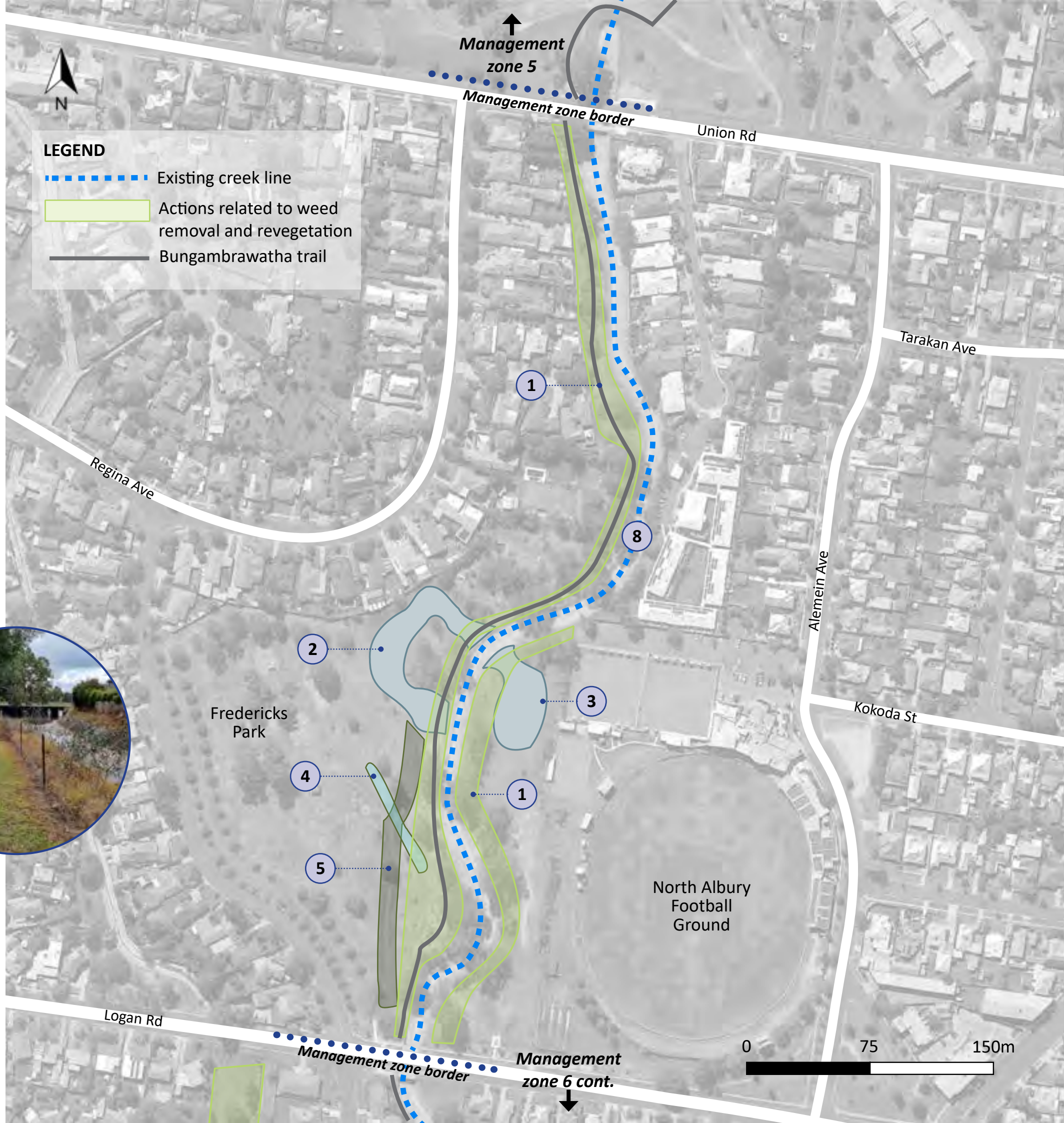
- 5 Shade planting
- 6 Improve channel side typology including weed spraying reduction, revegetation and more attractive fences



Channel form

Investigate naturalisation in accordance with typology 1, 2 and 3

- 8



Management

Zone 6 cont. & 10

Management zone 10 encompasses Little Black Springs Creek. The southern section is concrete lined, whilst the northern section has been dammed, creating a pond. Remnant vegetation occurs adjacent to the pond, however weeds are a notable feature of the zone.

Key management outcomes are to improve the **ecology** of Little Black Springs Creek and **activation** and **connectivity** through the zone.

Actions



Ecology

- 1 Weed removal and revegetation



Activation and connectivity

- 2 Formalise path
- 3 Historic creek line interpretation
- 4 Improve visual permeability of corridor to discourage anti-social behaviours.



Amenity

- 5 Improve channel side typology including weed spraying reduction, revegetation and more attractive fences



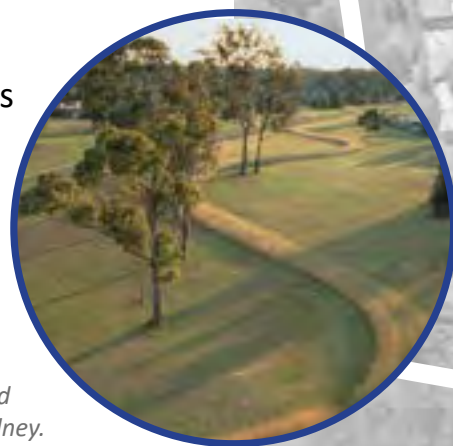
Community connection

- 6 Collaborate with community to manage the corridor, increase activation and public surveillance
- 7 Activate open space providing community gathering opportunities



Channel form

- 8 Investigate naturalisation in accordance with typology 1, 2 and 3



The Memory Line is a 2.7 km long band of ryecorn grass that marked the original course of Clear Paddock Creek in suburban Fairfield, Sydney.

Photo credits: Ian Hobbs Media



Management Zone 7

This zone is in the private ownership of the Albury Golf Club. It is the only discontinuous section of the Bungambrawatha Creek Trail that does not run alongside the waterway. Whilst concrete lined, remnant river red gums remain through the zone.

Outcomes sought are to explore ongoing opportunities for **activation and connectivity** and **water sensitive urban design**.

Actions



Water sensitive urban design

- 1 Engage golf club with a view to exploring opportunities for water sensitive urban design and integrated water management



Activation and connectivity

- 2 Engage with golf club to explore opportunities for improved activation and connectivity through the club grounds.



Management Zone 8

This is the most confined zone of Bungambrawatha Creek, characterised by a highly built up area with a very narrow corridor. The Bungambrawatha Creek trail is squeezed between the channel and property boundaries, with minimal shade cover. Occasional remnant vegetation remains, and there is need for channel renewal courtesy of wash outs behind the wall.

The key outcomes for the zone are to improve **activation**, **connectivity** and **amenity** along Bungambrawatha creek. Opportunities for improved **ecology** and **channel form** through naturalisation should be investigated further.

Actions



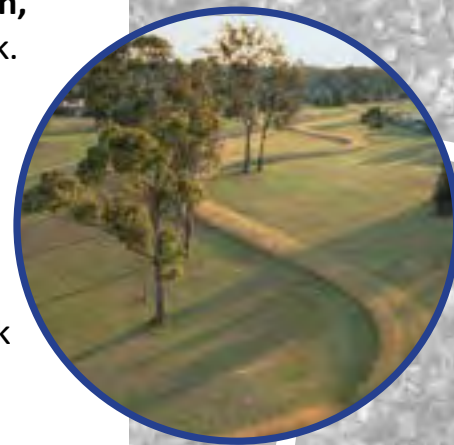
Activation & Connectivity

- 1 Investigate activation of the western bank with community gardens or go-slow path
- 2 Incorporate pedestrian bridge
- 3 Historic creek line interpretation
- 4 School partnership for shade planting
- 5 Shade planting over main shared-use path including exploration of opportunities to make room for more trees
- 6 Explore opportunities for activation, including public art in and adjacent the channel
- 7 Improve aesthetics of fencing
- 8 Cantilever deck structure for pathway, allowing additional room to provide landscaping and large trees for shade in shade planting location
- 9 Consider options to remove pathway from within the netball courts carpark



Channel form

- 10 Investigate channel naturalisation in accordance with typology 1 and 2
- 11 Investigate channel naturalisation in accordance with typology 4



Management Zone 9

One of the most highly visible sections of Bungambrawatha Creek, the channel runs adjacent to the Botanic Gardens before entering the Murray River at the recently constructed Bungambrawatha Creek outfall. Surrounding vegetation ranges from formal plantings associated with the Botanic Gardens to remnant river red gum floodplain vegetation adjacent to confluence with the Murray River.

Key outcomes for the zone are to improve **activation and connectivity** to the Murray River, improve stormwater **infrastructure** and investigate **channel form** improvements including bank stabilisation and naturalisation.

Actions



Activation and connection

- 1 Cantilevered pathway in accordance with typology 5 or remove Dean Street Parking and widen pedestrian pathway
- 2 Formalise existing pathway
- 3 Pedestrian bridge under existing Smollett Street bridge
- 4 English elm removal and terracing in accordance with typology 5



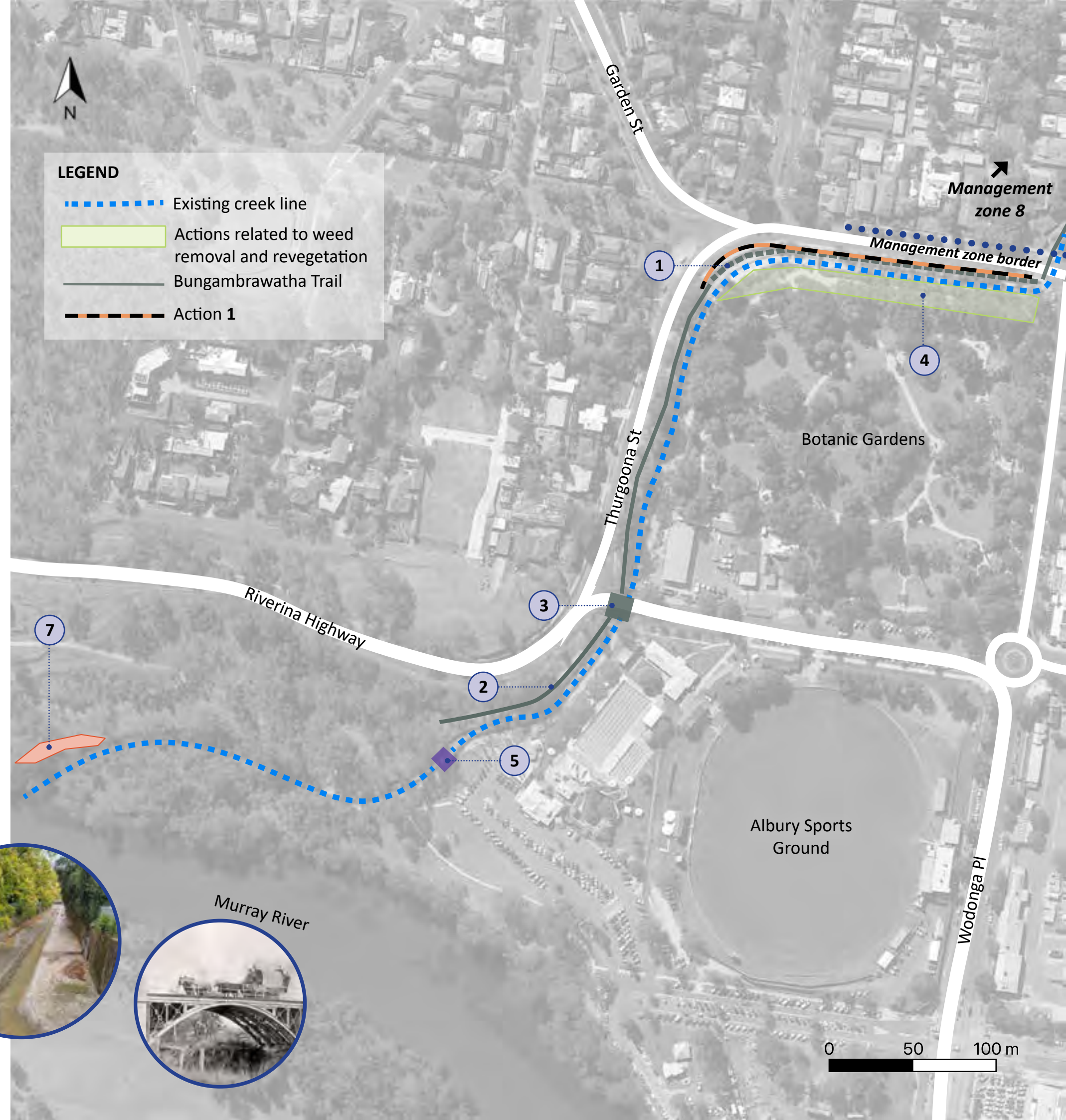
Infrastructure

- 5 Sediment trap removal to allow fish passage



Channel works

- 6 Investigate naturalisation in accordance with typology 5 to enhance interface with botanic gardens
- 7 Bank stabilisation



Management Zone 11

This zone includes Black Springs Creek. The upstream portion of the creek is dominated by dense weed growth, which also acts as a visual screen to the waterway. The downstream portion has a concrete lined low flow channel, with minimal surrounding vegetation.

Key outcomes sought for Black Springs Creek are improved **ecological condition, community and cultural connection**, and **activation and connectivity** of the corridor.

Actions



Ecology

- 1 Staged weed removal and revegetation
- 2 Investigate naturalisation



Community

- 3 Improve visual permeability into the waterway adjacent to community hall



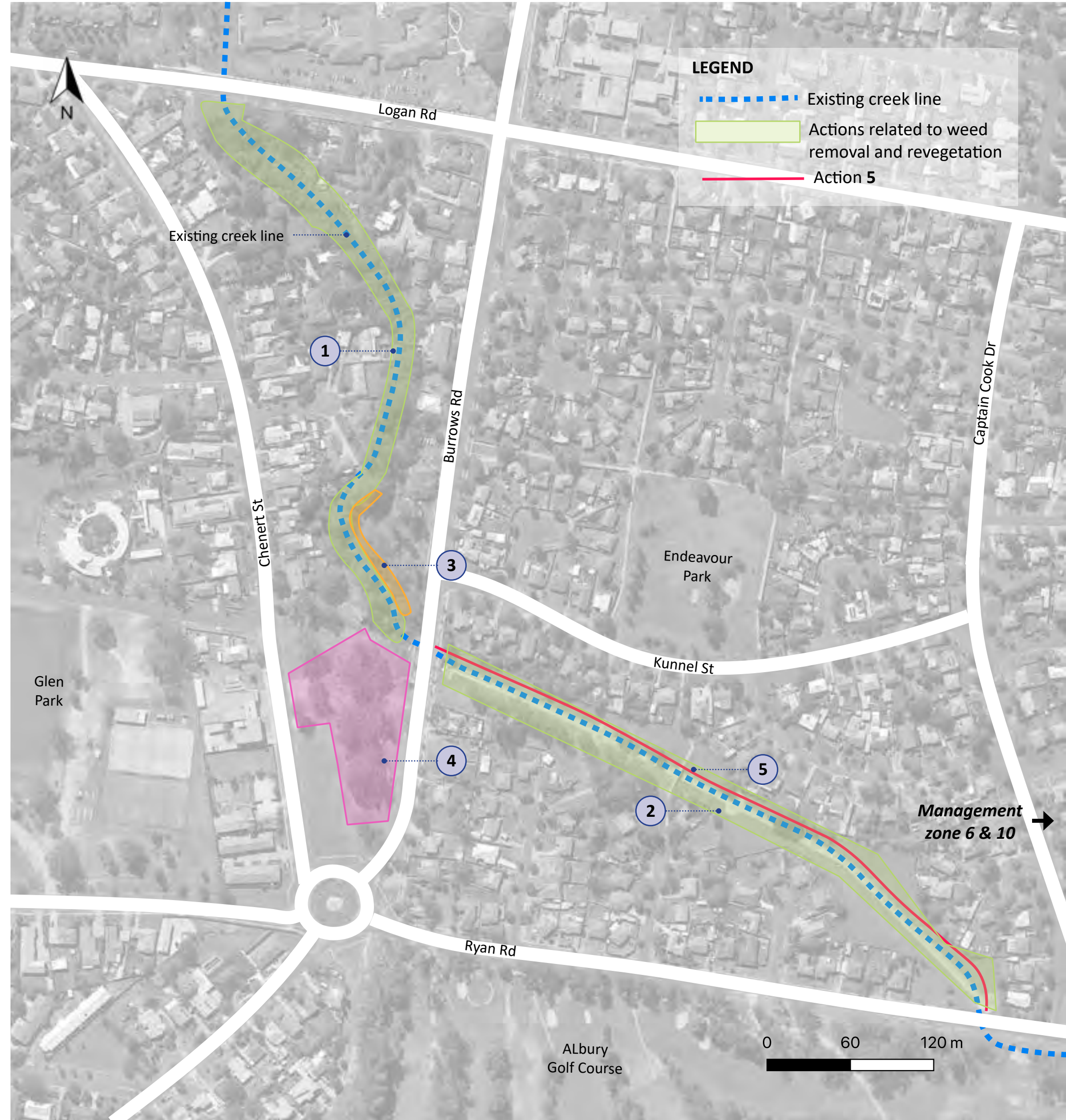
Cultural connection

- 4 Explore opportunities for partnerships with traditional owners and aboriginal groups to activate and manage open space

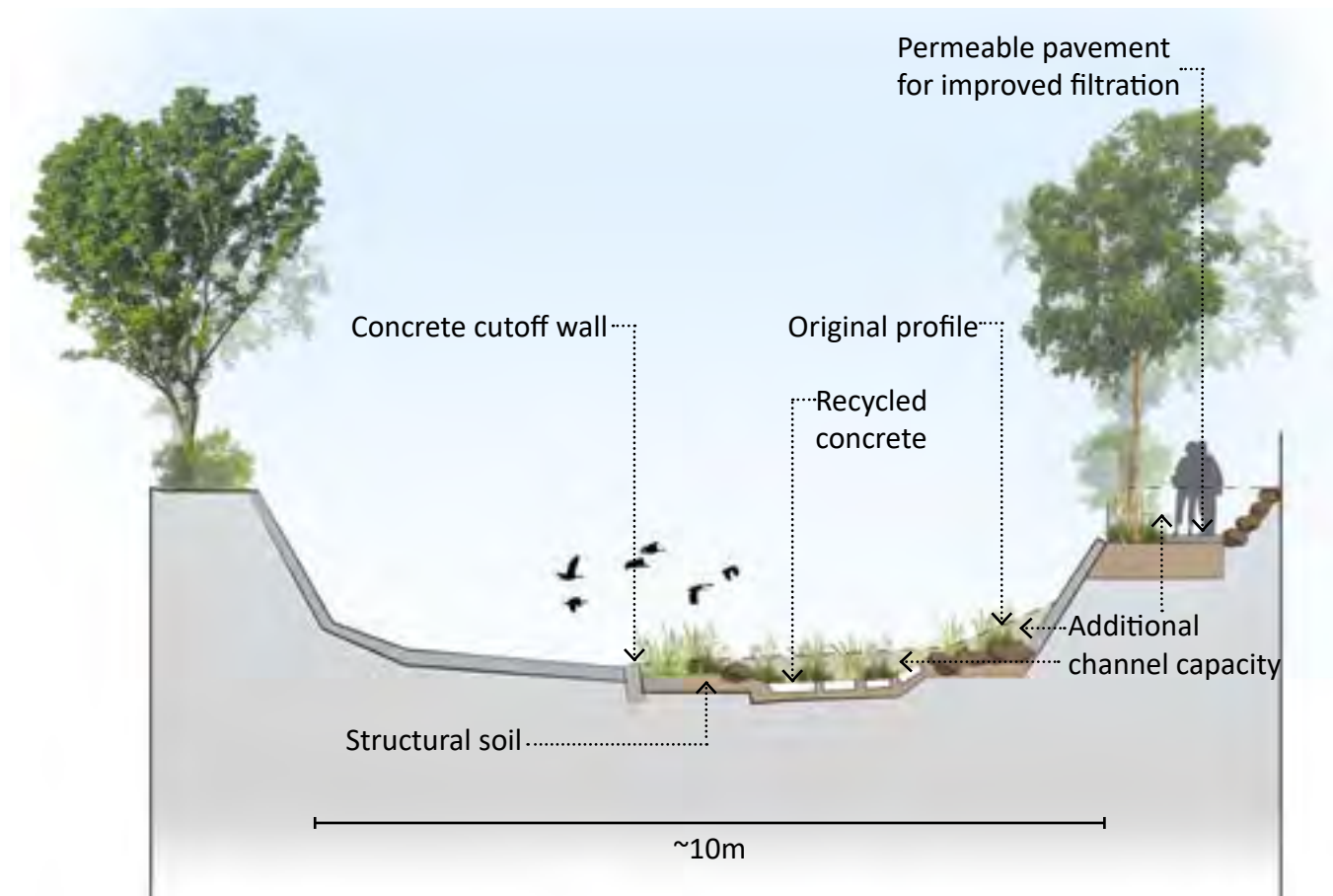


Activation and connection

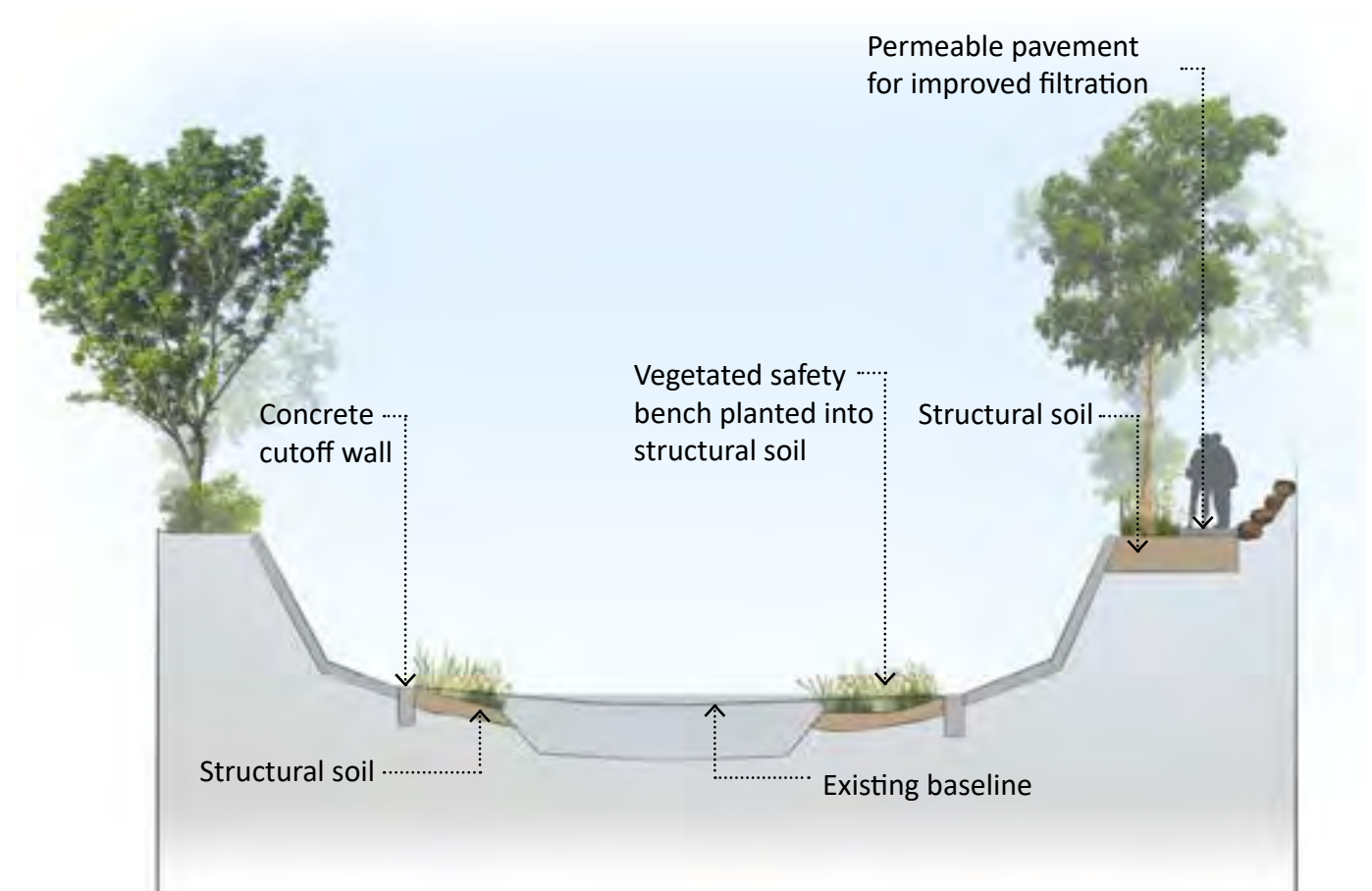
- 5 Investigate pedestrian connection between Burrows and Ryan Road



Creek Typologies

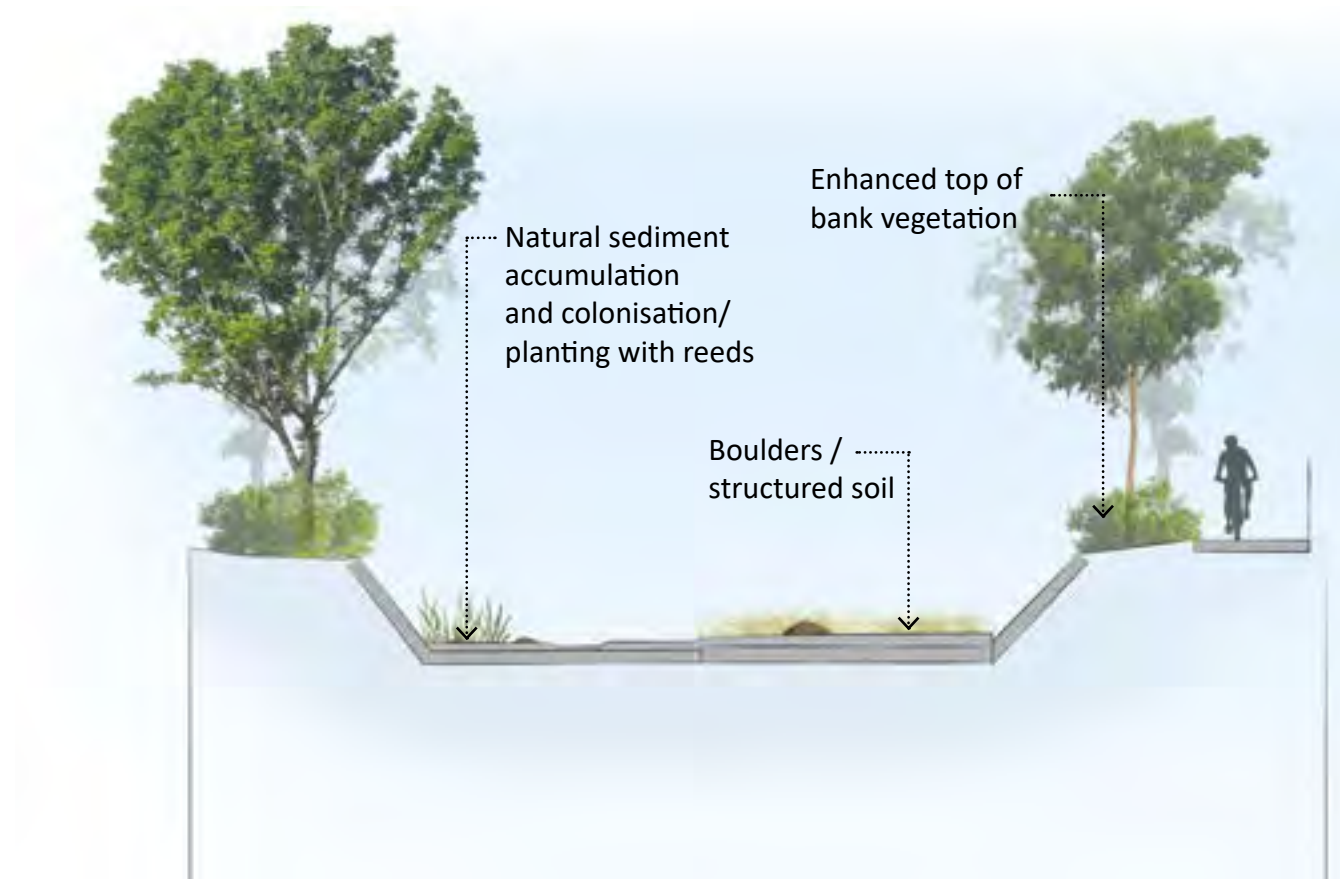


Typology1: Low flow with inset bench channel section

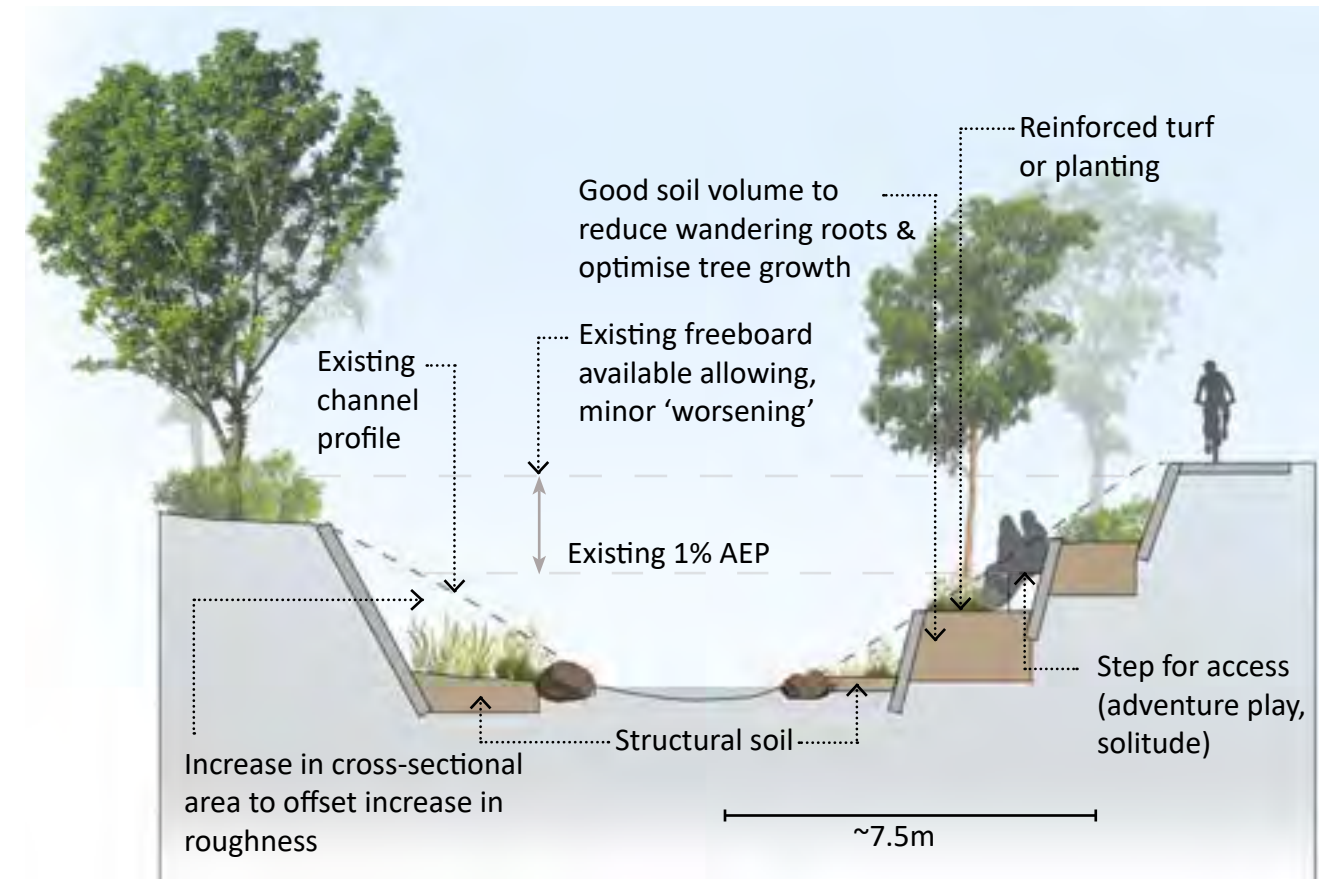


Typology 2: Pond section

Creek Typologies

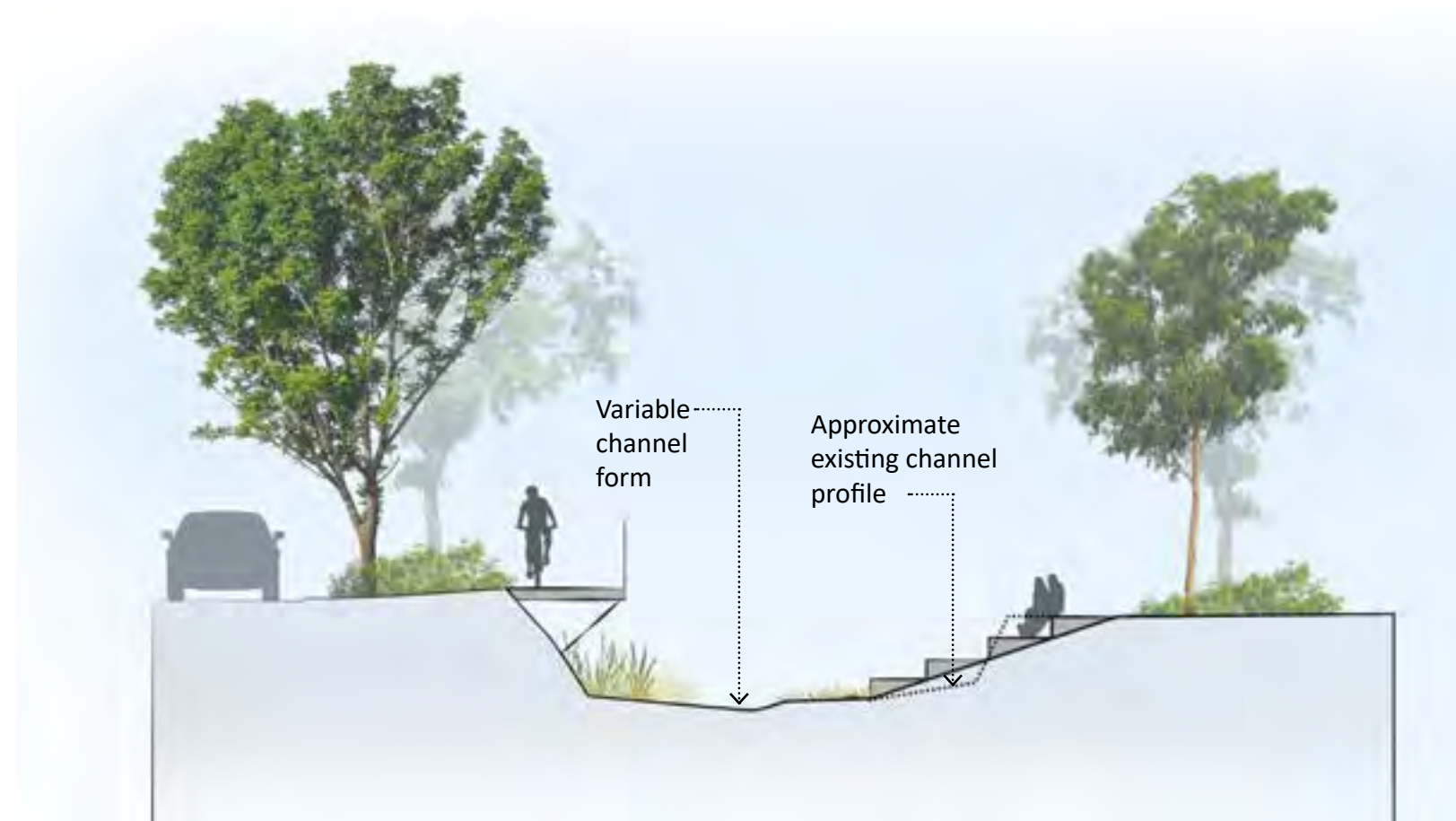


Typology 3: Lighter touch

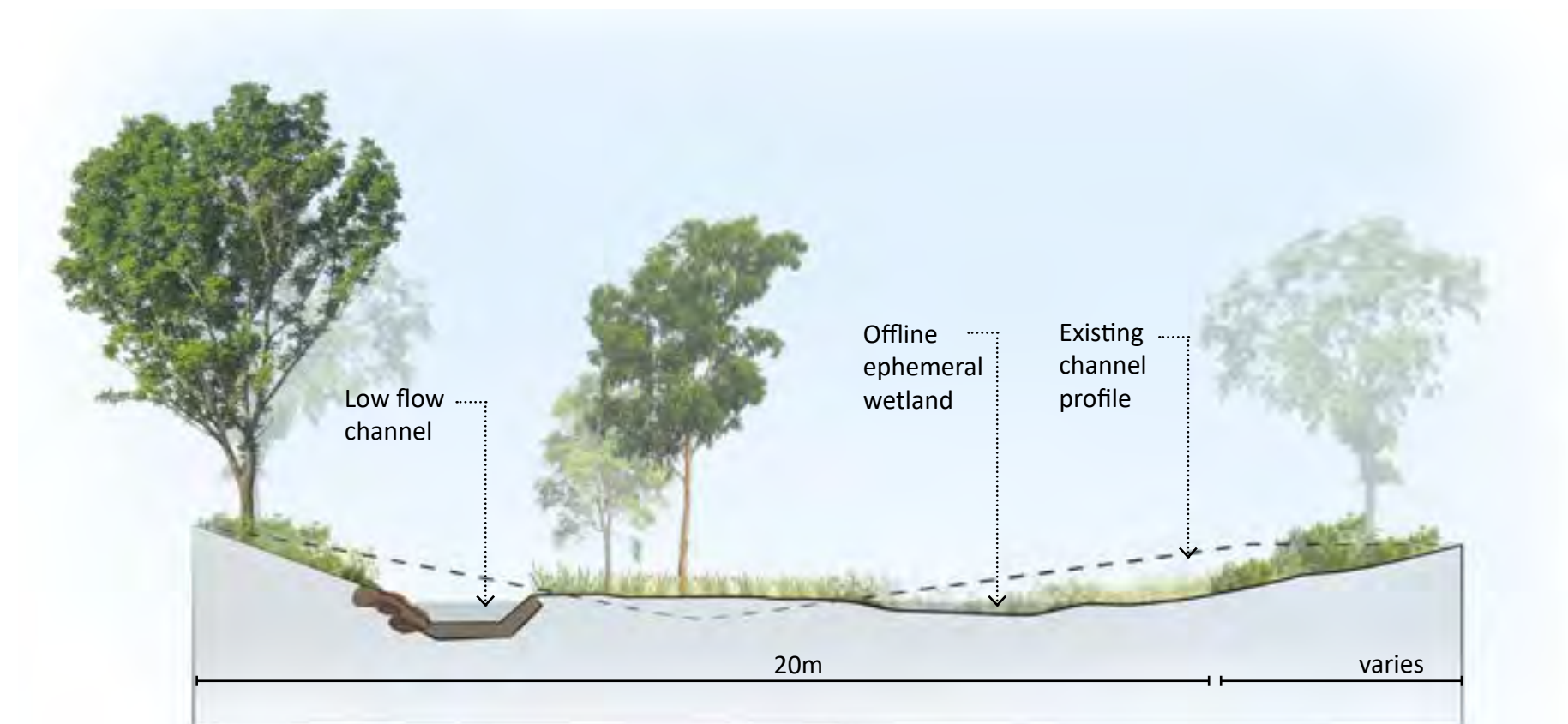


Typology 4: Terraced steppers

Creek Typologies



Typology 5: Cantilevered pathway



Typology 6: Retention Basis Section

Next Steps..

1. Partner with representatives of the Wiradjuri people to facilitate self-determination of their role in respect to the management and representation of culture in the Bungambrawatha Creek corridor.
2. Develop a works program for the implementation of the actions developed for the Bungambrawatha Creek Action Plan.
3. Undertake high resolution hydraulic model to test the impact of naturalisation on flooding and to investigate ways to provide a stable channel form.
4. Develop a consistent policy position for the management of waterways across the city, including Bungambrawatha Creek.
5. Undertake pilot projects for 'naturalisation' to test potential viable forms in low risk locations.
6. Broader catchment stormwater quality improvement plan including opportunities for gross pollutant capture.
7. Consider opportunities for opportunistic land acquisition to improve corridor connectivity and mitigate flood risk.

