

Gawler Urban Rivers Master Plan

April 2013



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EXECUTIVE SUMMARY

GAWLER’S URBAN RIVERS

Gawler’s rivers have long been a significant resource for the region’s inhabitants. The junction of the North Para and South Para to form the Gawler River provided food and shelter for the Indigenous Kaurna people, and the aesthetic and strategic value of the rivers was recognised by Colonel William Light in his original 1839 plan for Gawler. This initial plan resulted in the establishment of Gawler around the rivers, featured generous tracts of parkland adjoining the river corridors.

Since the European settlement of Gawler, Gawler’s rivers have been significantly modified by human activity, with substantial impacts on flow regimes and flooding, vegetation and biodiversity, and water quality and river health. Isolated but significant areas of indigenous riparian and floodplain vegetation remain, and the Town of Gawler and the Gawler community have been instrumental in protecting and building on these remnants in order to maintain the health of the river corridors and the waterways themselves. The green spine that runs through Gawler gives the town its unique character, and provides a significant ecological, social, recreational and cultural asset.

The Gawler Urban Rivers Project was initiated in 2009 with a goal to improve Gawler’s urban waterways, with a focus on the protection of river health, the conservation of biodiversity, and the provision of an interconnected and accessible parkland network. This project was managed by the Town of Gawler with funding contributed by the Department of Regional Australia, Regional Development and Local Government under the Better Regions Program. The Gawler Urban Rivers Project has delivered to the Gawler community:

- 8km of shared bicycle and walking paths (to be known as Tapa Pariara, or the Gawler Rivers Path – see Figure ES.1);
- five new bridges and river crossings;
- weed removal and revegetation works;
- stream stabilisation works; and
- this Master Plan.

The Gawler Urban Rivers Master Plan has been formulated to provide the Gawler community with a guiding tool for the future management of Gawler’s river corridors. The Master Plan provides a review of river health, biodiversity, heritage and recreation studies, an analysis of key management issues, identifies opportunities and recommends actions to maintain, improve and complement the unique attributes of Gawler’s urban rivers.

HOW TO USE THIS MASTER PLAN

The main body (Sections 2–7) of the Master Plan has been prepared to provide some background to the management issues associated with Gawler’s urban river corridors, including:

- Site Context
- Land Use
- Heritage & Culture
- Recreation
- Biodiversity & Environment; and
- Stormwater Infrastructure.

These sections provide a brief summary and of the context of the Gawler’s river systems and the township itself, as well as an analysis of the major issues, concerns and strengths of Gawler’s rivers.

Section 8 provides general recommendations and identifies opportunities for the improvement of Gawler’s river corridors as a whole. These have been developed based on the analyses provided in Sections 2–7, and include opportunities for development, conservation or further investigation.

Section 9 provides Action Plans specific to each of five Precincts within Gawler’s river corridors, as shown in Figure ES.2:

- Clonlea Precinct;
- River Junction Precinct;
- Gawler River Precinct;
- Gawler Central Precinct; and
- Dead Mans Pass Precinct.

The Action Plan for each Precinct identifies detailed recommendations, issues and opportunities. The aim of these Action Plans is to provide council, reserve managers, community groups or individuals who are managing and undertaking works within the river Precincts with a framework to guide remedial and development processes within Gawler’s urban river corridors. These Action Plans can be used as management tools to identify and prioritise actions to protect, develop and enhance the river corridor.

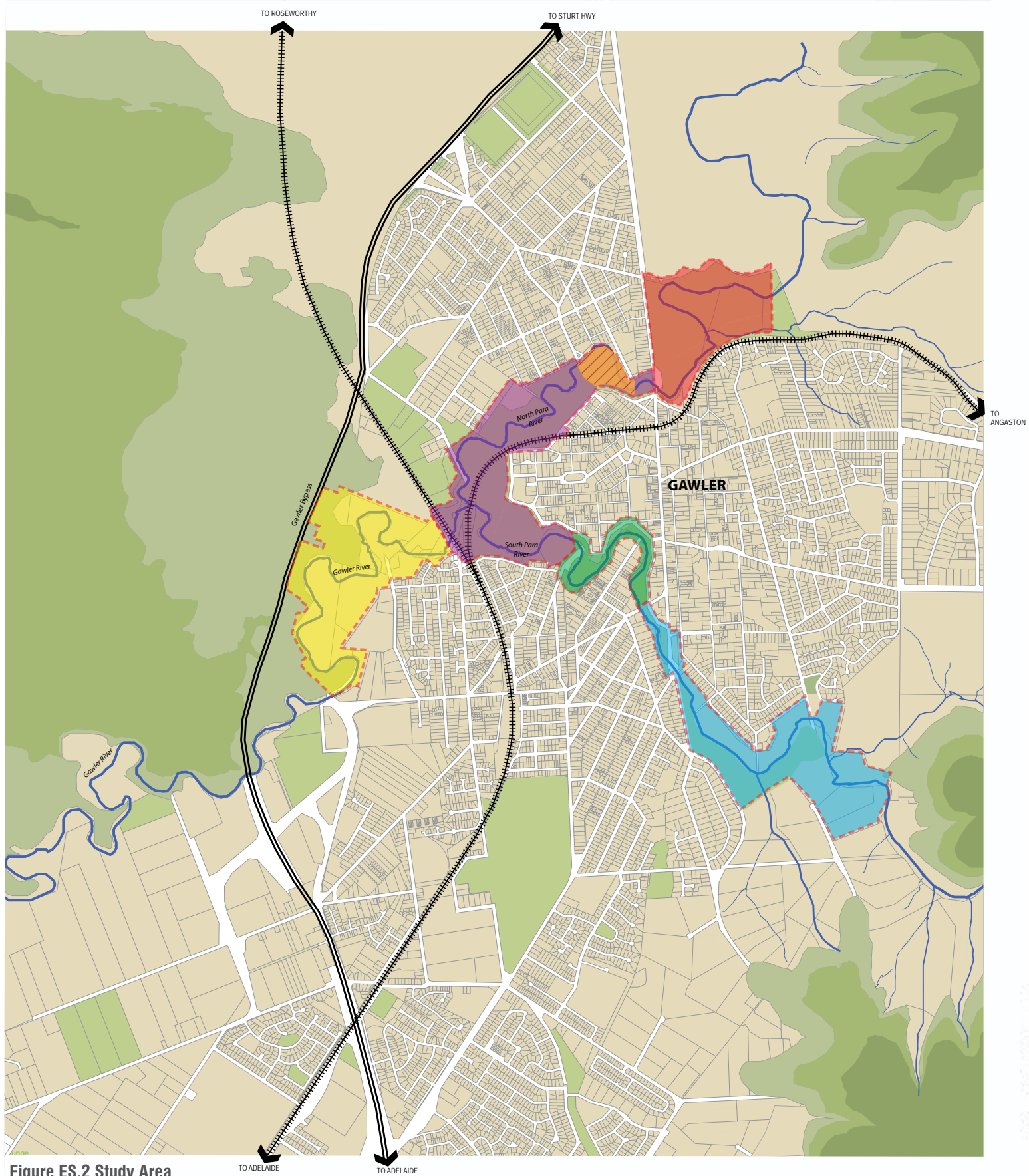


Figure ES.2 Study Area

LEGEND

- | | | | |
|---|-----------------------|---|-------------------------|
|  | Open space / Parkland |  | Gawler Central Precinct |
|  | Developed Areas |  | Clonlea Precinct |
|  | Northern Expressway |  | Dead Mans Pass Precinct |
|  | Railway Lines |  | River Junction Precinct |
|  | Watercourses |  | Gawler River Precinct |
|  | Study Area |  | Gawler Caravan Park |

LAND USE

Gawler's river corridors have largely been excluded from development since the inception of the town. Colonel Light's original plan included large areas of parkland concentrated around the rivers. This was to provide an aesthetically pleasing park setting as well as to provide protection from flooding.

The river corridors are principally zoned Special Uses, with areas of Open Space zoning at Dead Mans Pass, and Rural Living zoning around the River Junction and the Gawler River.

The Special Uses zoning preserves the original parkland setting of the rivers envisaged by Colonel Light by setting aside these areas for community uses, such as cultural activities, passive and active recreation and other low impact activities.

The Open Space zoning aims to preserve the open space character to contrast against the built-up urban areas of Gawler, provide for the conservation and enhancement of local biodiversity and provide for stormwater management and flood mitigation.

The Rural Living zoning allows for the construction of dwellings on large allotments of a minimum of 4 hectares. The Rural Living Zone also incorporates areas within the Gawler Rivers Flood Plain Policy Area, which requires dwellings to be constructed a minimum of 100m from the river banks with floor levels 300mm above the 1 in 100 year flood level.

Although these zonings have provided Gawler's river corridors with some protection, the population increases anticipated in the Gawler township and the northern region of Adelaide will place more pressure on open spaces such as these. It is important that these areas are managed as part of a wider strategy to ensure that there is sufficient open space to allow for recreational and cultural activities as well as biodiversity conservation.

HERITAGE & CULTURE

The junction of the North Para and South Para to form the Gawler River is recognised as an area of cultural significance for the Kaurna people of the Adelaide Plains. The rivers themselves are considered sacred to the Kaurna Dreaming, and there are numerous significant sites along the rivers, including painting sites, culturally modified trees, ochre quarries, fish traps, Corroboree sites, artefact sites, campsites and burial sites.

The original township of Gawler was sited and planned by Colonel William Light in 1839. Light had camped at Dead Mans Pass twice in 1837 during his exploration of the Barossa and regions north of Adelaide, and recognised the potential of the river junction area as a pleasant and strategic location for a town. Light's plan for Gawler included wide streets, Town Acres and broad parklands encircling the town, all hallmarks of Light's South Australian designs, and a response to the cramped and heavily developed conditions in London at the time.

The first Europeans to settle in the region arrived in February 1839, before the plans had been completed. John Reid and his family established themselves on 630 acres at "Clonlea", named for an area of Ireland. The site of their original homestead is now the location of the Clonlea Park playground. With the discovery of gold in the Barossa and copper at Kapunda, Gawler became a key stopping point for travellers heading north out of Adelaide. By 1848, the population had reached 300, and by 1851, was home to over 1,000 townsfolk, and had a flour mill and two breweries.

In 1852, the need to provide some planning and oversight to the development of the township was recognised by the incorporation of Gawler into four local councils. In 1857, the Municipality of the Town of Gawler was proclaimed, with Richard Turner as its first mayor.

The second half of the 19th century was a boom time for Gawler, with the construction of tramways, bridges, public baths, and a town hall, connection of the town to a permanent water supply and telephone system, and the establishment of many industries such as foundries, brickworks and ironworks. Many of the buildings constructed during this period are still standing, and the Town Centre of Gawler is recognised as a historic precinct in the Town of Gawler Development Plan.

The protection and conservation of Gawler's heritage assets is an important objective, as both the Indigenous and European histories of the area are significant aspects that contribute to the unique character and identity of Gawler.

RECREATION

Gawler is an important recreational hub for the region, providing recreational facilities that service not only the township itself, but also the several key population areas north of Adelaide. Gawler's recreational infrastructure caters predominantly for traditional sports, such as netball, tennis, cricket, golf, football and lawn bowls, but also includes facilities for croquet, greyhound racing and bike parks, as well as indoor sports (at the Gawler Recreation Centre).

Gawler is well served by a variety of sporting and community clubs, but the need for additional facilities has been identified, including an upgraded aquatics centre, additional passive recreation facilities.

Gawler's population is more than 21,000, and it is anticipated to grow to 35,000 by 2017. With the increase in population within the town of Gawler and the surrounding region, the demand for additional, expanded or upgraded facilities will increase accordingly, and detailed strategies for satisfying this demand will need to be developed.

The provision of the Tapa Pariara cycling and walking trails as part of the Gawler Urban Rivers Project will provide Gawler with another recreational resource, with the potential to link the Tapa Pariara paths with the NEXY bikeway and the Barossa Trail, providing a significant non-vehicular link between Adelaide and the Barossa via Gawler.

BIODIVERSITY & ENVIRONMENT

Although heavily impacted and modified by human development over the last 170 years, there are still areas of native vegetation along the river corridors. Gawler's river corridors provide a significant regional conservation resource, with numerous threatened flora and fauna species, as well as threatened vegetation communities, recorded in the area. In particular, Clonlea Park and Dead Mans Pass provide crucial habitat areas for native riparian and floodplain vegetation and native fauna.

These isolated but significant areas are under threat from weed invasion, human activity, feral animals and the impacts of urban development, and require careful management to maintain the unique biodiversity of Gawler's rivers. Gawler's green spine of riverine parklands provides a crucial community resource for aesthetic and recreational pursuits; however, the impact of human uses must be tempered by ensuring that the endemic flora and fauna within these parklands is conserved and protected.

The Gawler Urban Rivers Project included stream stabilisation works, weed removal and revegetation works, all of which will build on existing programs conducted by local community groups and the Gawler Council, and will contribute to improving the health and biodiversity of Gawler's rivers.

STORMWATER INFRASTRUCTURE

Gawler's stormwater network collects stormwater from the urban areas of Gawler and delivers it to the North Para, South Para and Gawler River. Within the Gawler stormwater catchment, land use is predominantly residential, with some industrial areas, rural living and open space.

Given the age of Gawler's stormwater network and the extent of urban expansion experienced recently and anticipated in the near future, the capacity of Gawler's stormwater infrastructure may need to be reviewed to ensure it is sufficient to adequately deal with high flow events.

There is limited treatment infrastructure in place within Gawler's stormwater network. Therefore, the majority of Gawler's stormwater is disposed of directly to the rivers with no treatment. Providing some mechanism of stormwater treatment to key outlet locations could provide significant flood mitigation, bank erosion and ecological benefits to Gawler's rivers, as well as to the urban areas of Gawler itself.

OPPORTUNITIES

The Gawler Urban Rivers Master Plan has identified a number of key opportunities that could be implemented to improve the management, use and development of Gawler's river corridors. These are based on previous reports as well as new initiatives contemplated during the development of the Master Plan, and are described in detail in Section 8. The implementation of these initiatives will largely be determined by feasibility and funding constraints, but it is considered that each opportunity would provide significant benefits to Gawler, its rivers and its regions. Key opportunities include:

- Heritage walk – linking the history of the rivers with existing heritage walks within Gawler's Historic Town Centre;
- Sculpture walk – providing a series of public art installations reflecting the historical and environmental importance of the rivers to Gawler;
- Multi-purpose facility – building on Gawler's role as a regional hub to provide a sports, entertainment and events venue, which could provide tourism, convention and other commercial benefits;
- Aquatic centre – upgrading the existing swimming centre or constructing a new facility to provide a regional aquatics facility for the north of Adelaide;
- Skate park – providing a central, accessible and safe facility for youth recreation, possibly linked to the Tapa Pariara cycle paths;
- Transport connections – extending the Tapa Pariara paths through other areas of Gawler, and linking Gawler's trails to the NEXY and Barossa Trail cycle paths;
- Fitness trail – providing outdoor exercise equipment along the Tapa Pariara alignment to encourage outdoor physical activity within the river corridors;
- Recreation events – initiating a cycling “Tour de Kids” and regular “River Challenge” fun run circuit;
- Gawler Rivers Linear Park – establish a formal, linked parkland along the river corridors, consolidating the existing zoning provisions and expanding where possible;
- Biodiversity Highlights Path – a Biodiversity Path could complement the Heritage Walk and Fitness Trail concepts, highlight areas of significant vegetation, habitat areas, the use of local species by Indigenous groups and provide an educational resource to encourage the protection and conservation of local biodiversity; and
- Planning and Management Initiatives – provide mechanisms to coordinate between Gawler Council, State Government and local community groups to improve the management and use of Gawler's river corridors, including the ongoing development of open space strategies, consistent landscape design, and the planning and implementation of conservation programs.





Figure ES.1a Tapa Pariara, the Gawler Rivers Path - northern section

- LEGEND
- Shared Cycle Path
 - Shared Use Zone
 - Walking Trail
 - Bridge

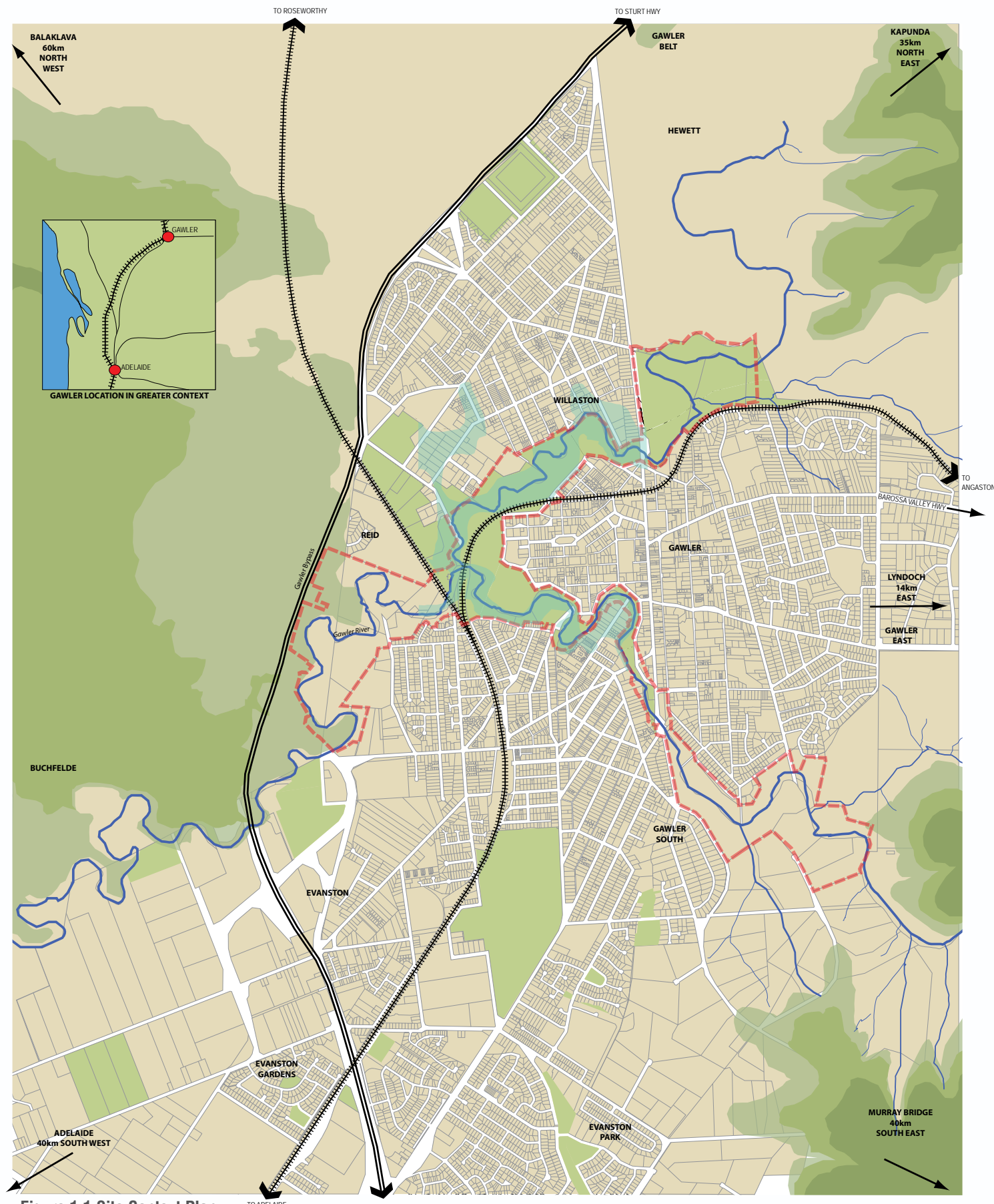


Figure ES.1b Tapa Pariara, the Gawler Rivers Path - southern section

Section 01 - Project Background

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1.1 GAWLER'S URBAN RIVERS

The Gawler Township is located near the confluence of two major rivers, the North and South Para, which combine to form the Gawler River, the most significant watercourse on the Northern Adelaide Plains (see Figure 1.1). Since European settlement of Gawler in 1839, the flow regime of both the North and South Para rivers has been significantly modified by human activity. Farm dams in the upper catchments have reduced base flows while land clearing, farming and development adjacent to the rivers have had substantial impacts on the health of the rivers. Both the South Para and North Para have been regulated by the construction of dams for water supply and flood control.

The clearance of land for agricultural production has resulted in an increase of runoff and stream erosion, especially in earlier years when summer fallowing of cropping land was a common practice, while increased urban development has also placed additional pressure on the river system including:

- Increase in runoff volume and peak flow rate due to the increase of impervious areas in the catchment;
- Removal of indigenous riparian vegetation resulting in bank erosion;
- Introduction of pest flora and fauna species;
- Poor water quality; and
- Restrictions in the floodplain space available for natural changes in channel morphology.

To date these threats to the quality of the riverine ecosystem have been not been widely recognised and management efforts have been inconsistent and fragmented.

The purpose of this Master Plan, therefore, is to assess and consider these and other issues, and to present a clear way forward for achieving improvements in stream ecology and the cultural and regeneration values of the North and South Para River as they pass through the Gawler Township, whilst recognising the river corridors an important recreational space for the Gawler community.

1.2 PROJECT DESCRIPTION

In 2009, the Town of Gawler engaged the SMEC Adelaide to manage the Gawler Urban Rivers Project. This project was funded under the Federal Governments' Better Regions initiative under the Department of Regional Australia, Regional Development and Local Government.

The vision of the Gawler Urban Rivers Project was to improve the use, access and ecology of Gawler's river corridors, by implementing the following actions:

- Undertake bank stabilisation works at key locations;
- Assess river health and water quality along the North Para and South Para, including:
 - Extent of riparian vegetation;
 - Assessment of weed and pest infestation; and
 - Assessment of fauna;
- Assessment of heritage and recreation within the corridors;
- Design and construction of the Gawler Rivers Path, or Tapa Pariara (see Figure 1.2), incorporating:
 - a sealed shared use (cycling and walking) path along the rivers between Dead Mans Pass in the south and Clonlea Reserve in the north (approximately 7.5km);
 - Design and construction of new and/or upgraded existing walking trails (approximately 4.5km);
 - Design and construction of new pedestrian bridges and river crossings to link the elements of Tapa Pariara.
- Preparation of a Gawler Urban Rivers Master Plan (this document).

1.3 PROJECT TEAM

The Gawler Urban Rivers Master Plan process has been overseen by the Town of Gawler (David Collins, Manager Engineering Services) with assistance from the community-based Advisory Working Group, comprising the following members:

- *Graham Brookman (community member)*
- *Andy Day (Adelaide and Mount Lofty Ranges Natural Resources Management Board - AMLRNRM)*
- *Rachel Yacoumis (community member)*
- *Michael Garrod (AMLRNRM)*
- *Alan Jamieson (Gawler Environment and Heritage Association – GEHA)*
- *Paul Koch (community member; Councillor, Town of Gawler after November 2011)*
- *Liz Nannes (GEHA)*
- *Andrew Philpott (Light Regional Council)*
- *Cr Peter Russell (Councillor, Town of Gawler until November 2011)*
- *Cr Adrian Shackley (Councillor, Town of Gawler)*
- *Melanie Spurling (AMLRNRM)*

The Project Team involved in the production of the Master Plan and Action Plans was lead by SMEC, who has been responsible for the following tasks:

- *Project Management and Co-ordination*
- *Engineering Design and Tendering for Paths and Bridges*
- *Biodiversity and Environment Study*
- *River Health and Water Quality Assessment*
- *Master Planning (SMEC Urban)*

1.4 CONTEXT, OBJECTIVES AND SCOPE OF THE MASTER PLAN

1.4.1 Master Plan Context and Objectives

The confluence of the three rivers plays an important role in the identity and character of the Town of Gawler. The river corridors establish important boundaries which shape the Township, and the floodplain land provides environmental, social, recreational, cultural, heritage and aesthetic values that could be further enhanced and developed for a variety of uses. Significant pre European vegetation remains along Gawler's river corridors, along with historical evidence of the early settlement; these aspects of the Gawler Township demonstrate its position as one of the most important historical townships in South Australia.

The provision of Gawler's functional, interactive, open space parkland along the riverine corridors is intrinsic to the lifestyle and image for Gawler as a Country Town. The sense of 'openness', 'country', 'heritage' and 'township' (as portrayed by the slogan "The Best of Town & Country") is therefore important to the promotion of Gawler as a liveable place, and should be protected.

The main visions for the development of the Gawler Urban Rivers are:

- To provide a connected and integrated riverine parkland that aims to protect the natural environmental, social, cultural and landscape values of the river corridors;
- To preserve and enhance the natural features within the river corridors;
- To better manage the river corridors to create a healthy river system that will encourage biodiversity and create improved habitat for indigenous flora and fauna;
- To provide an effective and safe network for non-vehicular transport and a valued recreational amenity for the Gawler Township and wider region; and
- To promote Gawler as a liveable place, building on the linkage between 'town' and 'country'.

Critical to the development of the riverine corridor as a functional landscape is the maintenance of river health. The health of Gawler's rivers is fundamental to the social and economical development of the Gawler Township and its surrounds. The success of the riverine land use and its management will not only shape the identity of the Gawler Township, it will also encourage its use and attraction to the area adding to the economic value of these corridors.

Key objectives of the Town of Gawler's Strategic Plan 2010-2018 (Town of Gawler 2010) are the need to maintain and strengthen the unique identity of Gawler, and to protect and manage natural resources and the built environment. This Master Plan has been developed to complement these objectives of the Strategic Plan.

The Strategic Plan 2010-2018 identifies that Gawler is different from the outer suburbs of Adelaide, and the Gawler community wishes to maintain its separation from the suburbs and strengthen the rural space around it, as this contributes directly to its distinctive identity. Gawler's identity is linked to the town's prominent built and natural heritage, including the river system and adjoining parklands. Given the importance of the river corridors in defining Gawler's character and 'personality', optimising the environmental and recreational outcomes from these open space areas and the community facilities along the river corridors is a key objective for both the Gawler Council and the local community. This is particularly relevant given the anticipated increased pressure on these elements as Gawler grows and develops.

The overall aim of this Master Plan is to provide a guided document outlining opportunities for improvement of the Gawler's river corridors, based on an analysis and review of the current issues affecting these corridors and the surrounding natural environment. The Strategic Plan 2010-2018 includes several objectives focussing on the natural environment. The implementation of this Master Plan can contribute to these objectives by providing a framework for:

- improvement of the natural and built environment and promote community awareness and participation;
- an environmental management strategy for cultural activities and assets;
- good quality open space that responds to community needs and attracts use;
- an Open Space Strategy that identifies current needs and influences future development;
- Improvement of biodiversity for Council reserves;
- a stormwater system audit; and
- active and passive recreation opportunities combined with biodiversity throughout Gawler's urban rivers, parklands and river reserves.

These objectives can be achieved through improvement and careful management of its natural and built environment.

The Master Plan aims to address Gawler Council's vision to provide an improved community service by establishing active and vibrant public spaces, promoting community activity and involvement with a focus on walking and cycling networks, and linking into the township's existing public transport service. Part of the purpose of the Master Plan is to provide support for the current and proposed development of linear parks by integrating their facilities on a town wide basis and assist in the acquisition of external funding.

Overall, the objective is to implement Gawler Council's vision for the future development of Gawler including the vision for community development through a succinct and sustainable Master Plan. This Master Plan primarily responds to the background information, reports and studies outlined by the 'Gawler's Urban River Master Plan - Definition Statement' (AWE 2008).

This Master Plan has been formulated to provide the Gawler community with a single document that can be used as a guiding tool for the future management of land along Gawler's river corridors. The Master Plan provides an analysis of key management issues, and identifies a range of opportunities to maintain, improve and complement the unique land use, cultural, recreational, aesthetic and ecological attributes that Gawler's urban rivers possess.





Recommended treatment & improvement opportunities are presented in Section 8, and a series of Action Plans is provided in Section 9, to be implemented in accordance to priority (high, medium or low) subject to Council and available funding, and to inform:

- Development of policies and zoning for river corridors (refer to Strategic Plan) to reflect the importance of biodiversity conservation, open space and recreational use.
- Development of policies, programs and initiatives related to storm water management, recreation facilities, bike paths, walking tracks and conservation of indigenous, built and natural heritage.
- Providing a connected and interactive Open Space Corridor.

Consistent with the Gawler East Development Plan Amendment (DPLG 2010a), the Master Plan aims to provide a connected and interactive open space corridor that not only utilises current assets, and also to improve, manage and develop future assets along the riverine corridors. The Gawler Urban Rivers Project, including this Master Plan, incorporates these aims through the construction of shared use paths, pedestrian paths and new bridges to improve the connectivity of activity areas, and recommendations for the management of the open space areas along the river corridors.

1.4.2 Master Plan Scope

The preparation of the Master Plan has been prepared in general accordance with the document, 'Gawler's Urban River Master Plan - Definition Statement' (AWE 2008). This document has generally guided the scope of the Gawler Urban Rivers Project, and of the Master Plan itself.

The development of this Gawler Urban Rivers Master Plan is Gawler Council's strategic response to a growing awareness and community concern over the state of the North Para, South Para and Gawler River watercourses within the township area of Gawler. The Master Plan is designed to inform the management of Gawler's urban rivers to ensure that future development along these river corridors can sensitively respond to the key aspects that have been identified as most important to the Gawler community. These key aspects are:

- Heritage & Culture (includes Indigenous and European history, public art);
- Recreation (access, facilities, demands);
- Land Use (types of land uses);
- Biodiversity and Environment (flora and fauna, weeds, pests and water quality, stormwater & flood management).

The preparation of the Master Plan was undertaken in the context of addressing these four key aspects, and involved the following tasks:

- Review previous studies and management plans prepared for Gawler's rivers (including those undertaken as part of the GURP above);
- Identify heritage and cultural values and provide recommendations for opportunities to enhance these values within the river corridors;
- Assess recreational spaces facilities within the river corridors, and provide recommendations for their improvement and augmentation;
- Identify current land uses and opportunities and options for potential future land uses within the river corridors;
- Assess biodiversity values within the river corridors and provide recommendations to conserve and enhance the riverine and riparian habitat to aid the recovery and re-establishment of native flora and fauna; and
- Provide summaries of the above reviews, assessments, opportunities and recommendations in a benchmark reference document designed to provide broad contexts and concepts to guide and inform Gawler's long term planning and management of its river corridors.

1.5 PREVIOUS STUDIES AND REPORTS

Prior to the development of the Master Plan, a number of independent studies have been completed on the urban water courses in the Gawler area. Existing reports and studies which assisted with the production of the Master Plan include:

- Gawler Urban Rivers Master Plan: Definition Statement (AWE 2008)
- Bank Stability Assessment for Gawler Rivers (AWE 2009)
- Biodiversity and River Health Report (SMEC 2010)
- Technical Report on Heritage and Recreation (Ruan Consulting 2010)
- Town of Gawler Walking and Cycling Plan (QED 2008)
- Apex Park Implementation Strategy (James Hayter & Associates 2002)
- Action Plans for Whitelaw Creek, Clonlea and Dead Mans Pass (Caves, Seaman & Taylor 2000, 2000a, 1999)
- Action Plan for Gawler River Junction (Nardoo Studio 2002)
- Dead Mans Pass Management Plan (Town of Gawler 2001)
- Gawler River Development Framework (Swanbury Penglase & Ormsby 1999)
- Gawler River Open Space Strategy (Swanbury Penglase & URPS 2009)
- Gawler Council Development Plan (Department of Planning and Local Government 2011).

Additional resources that have contributed to the development of this Master Plan are listed in Section 10.





Figure 1.2a Tapa Pariara, the Gawler Rivers Path - northern section

LEGEND

- Shared Cycle Path
- Shared Use Zone
- Walking Trail
- Bridge



Figure 1.2b Tapa Pariara, the Gawler Rivers Path - southern section

Section 02 - Site Context

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02 Site Context

2.1 PROJECT LOCATION

The Gawler Township is located approximately 45 km north east of Adelaide within the Adelaide and Mount Lofty Ranges Natural Resource Management region (see Figure 1.1).

The Gawler River is approximately 30 kilometres in length from Gawler to the coast at Port Gawler and is fed by two main river systems, the North and South Para rivers. These rivers flow from the Mount Lofty Ranges and converge at the township of Gawler to form the Gawler River. The North Para begins near Eden Valley and flows through the world famous wine district of the Barossa Valley. The South Para flows northwest through the Mount Lofty Ranges before merging with the North Para at Gawler.

The South Para begins near the township of Kersbrook, and flows through land used mainly for softwood timber production and broad scale agriculture. There are large tracts of native vegetation in the upper reaches of the South Para, and smaller areas in the North Para catchment.

The Town of Gawler is a major commercial centre and acts as the central hub for northern regional areas including the wine making districts of the Barossa Valley. It was established in 1839 as a stopping point at the foot of the Mount Lofty Ranges on the main routes between Adelaide and destinations such as the River Murray and the mid-north. Gawler was the first major settlement north of Adelaide, and is one of South Australia's most historically important towns. A section of the original town has been declared a State Heritage Area to preserve the historic buildings and streetscapes.

2.2 STUDY AREA

The Study Area of the Gawler Urban Rivers Master Plan (see Figure 2.1) broadly includes the urban reaches of the North and South Para rivers from Hewett in the north east and the proposed Gawler East area in the south east through to the Gawler Bypass road on the Gawler River. The width of the corridor is mainly defined by the 100 year flood inundation extent; however, areas outside of this corridor have also been considered (including in Dead Mans Pass Reserve, Clonlea Park and the River Junction area).

The Study Area boundaries are defined by:

- The Urban Growth Boundary along the South Para,
- Clonlea Park bounding the North Para and
- The Bypass road across the Gawler River

The Study Area is a picturesque place of semi-rural character, underpinned by the stands of significant indigenous riparian vegetation and the wider areas of Council reserves with significant remnant native vegetation. It acts as a key drainage, recreational and landscape feature for the town of Gawler. The town itself was planned and established around Gawler's rivers system and naturally contains a great deal of historical importance. The rivers are the reason that Gawler was established as a town; any development along the river corridors needs to reflect their historical significance.

Gawler is significantly important as it is South Australia's first country town, and was designed by Colonel William Light. It was established in 1839 and to the present day is a crossroad between the Adelaide metropolis and the rural hinterland, providing both a natural, country setting with a vibrant and attractive centre. For more heritage information refer to Section 4 of the Master Plan.

Improvements in environmental management could result in a greater ability of the river system to cope with peak flows and the stress of the urban development and storm water discharge and its erosive impact. Fundamental to a healthy river system is not only its water quality but also its adjacent land use and its attraction.

One aspect of the Council Strategic Plan for Gawler is the improvement and beautification of its riverine corridors and an encouragement of healthy community through the interaction with its parklands, interconnecting paths and cycle network.

For the purpose of this Master Plan the rivers in the town of Gawler are surrounded by parkland of varying characters, offering a wide range of activities. These are classified into five study precincts as described below (see Figure 2.1):

- Clonlea Precinct;
- River Junction Precinct;
- Gawler River Precinct;
- Gawler Central Precinct; and
- Dead Mans Pass Precinct.

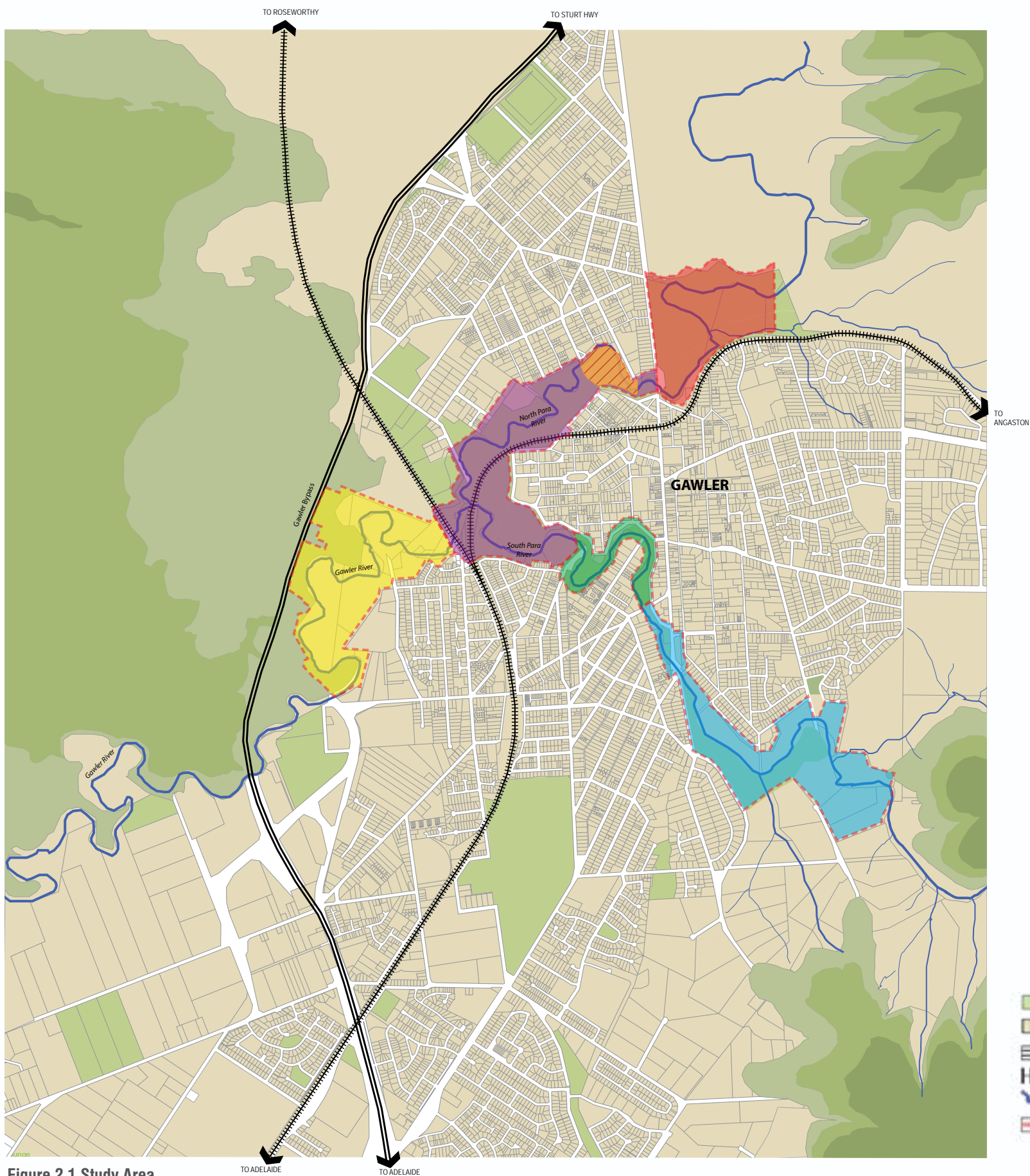


Figure 2.1 Study Area

LEGEND

- | | |
|---|---|
|  Open space / Parkland |  Gawler Central Precinct |
|  Developed Areas |  Clonlea Precinct |
|  Northern Expressway |  Dead Mans Pass Precinct |
|  Railway Lines |  River Junction Precinct |
|  Watercourses |  Gawler River Precinct |
|  Study Area |  Gawler Caravan Park |

2.2.1 Clonlea Precinct

Clonlea Park is located on the North Para, directly north of the town centre at the end of Murray Street. The Clonlea Precinct includes ovals, tennis courts and high value passive recreation and biodiversity areas around the North Para and Whitelaw Creek watercourses.

2.2.2 River Junction Precinct

The River Junction Precinct includes the junction of the Gawler, intersection of North & South Para rivers directly west of the town centre and the North Para corridor until it meets the Clonlea Precinct at Murray Street. It includes the Essex Park area and extends along the South Para beyond the actual junction to the Fourteenth Street bridge. The River Junction Precinct thus includes the main formal recreation areas within the river corridors, including the former BMX Park, Caravan Park, swimming centre, netball, tennis, croquet and petanque courts, bowling green, golf course, Gawler Oval and Showgrounds. This precinct also includes passive recreation areas such as Parridla Taikondi (the area around the actual river junction).

2.2.3 Gawler River Precinct

The Gawler River Precinct covers the area extending from the Roseworthy line rail bridge to the Gawler Bypass Road, which also forms the boundary with the Light Regional Council. This area includes a mix of privately held land and land under Council ownership. The area of Council land will increase with changes in land use and create new connections to the greater Gawler parklands area.

2.2.4 Gawler Central Precinct

The Gawler Central Precinct adjoins the River Junction Precinct at Fourteenth Street, and includes the informal parklands of Goose Island and Duck Flat, and the more formal areas of John Martin Plaza and Apex Park. Apex Park is located on the South Para, and is part of the gateway to central Gawler from Adelaide. The Gawler Central Precinct is close to the business centre of Gawler, and is characterised by the heritage significant Moreton Bay Fig trees along Julian Terrace and other historic plantings along Scheibener Terrace. Apex Park provides passive open space areas which are used for local community events, picnics and a rest area for shoppers, workers and visitors. Apex Park is also a part of the Gawler Heritage Trail network, containing walking tracks, a playground and public amenities.

2.2.5 Dead Mans Pass Precinct

Dead Mans Pass reserve is located on the South Para river, south of the town centre at the end of Murray Street. The Dead Mans Pass Precinct includes the South Para river corridor from Bridge Street to the southernmost extent of the Study Area. The eastern portion of this Precinct includes parts of the proposed Gawler East development. This precinct currently provides passive recreation areas as well as considerable biodiversity value.



View of Gawler Caravan Park from the North Para River



Section 03 - Land Use Analysis

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03 Land Use Analysis

3.1 ZONING

Any new or improvement works done within the Study Area will need to comply with the current zoning requirements. Pursuant to the current Gawler Development Plan (DPLG 2011), the Study Area is principally zoned Special Uses, although there are large areas within the Study Area zoned as Open Space (around Dead Mans Pass) and Rural Living (around the River Junction), as shown in Figure 3.1 and described in Appendix 1.

3.1.1 Special Uses Zone

The primary purpose of the zone is for accommodating public and private development of an institutional or open character, principally for community activities and uses, with business use not generally envisaged. The Special Uses Zone comprises a range of identifiable land use precincts including cultural activities, passive recreation, active recreation, spectator sports, tourist uses, and natural or conservation areas, along the North and South Para and Gawler rivers. The Special Uses Zone has been largely unchanged since the 1980s, and currently allows for active and passive recreation use or low impact activities. The need to preserve and enhance Gawler’s natural assets of the river system and natural environment requires a review of zoning policies to enable a more sustainable approach in management and conserving the riverine corridor. In addition, the zone has a significant amenity function by providing a distinctive setting for urban development and an opportunity for either tall mature trees, such as those that are present along the urban river system, or long vistas over open and green spaces.

Policy Areas

Within the Study Area, the Special Uses Zone is also contains the following Policy Areas:

Special Uses Zone	
1	Historic (Conservation)
2	Caravan and Tourist Park

Historic (Conservation) Policy Area

The Historic (Conservation) Policy Area encompasses the town’s rivers and parklands adjoining the original streets and allotments of the town of Gawler (i.e., north of First Street). The original town was laid out by Colonel Light in 1839, and is of historic significance as it still clearly illustrates the initial footprint of the town and is a successful example of a grid layout plan adapted to the topography and natural features of the location. The original street pattern reflecting the form of the rivers and topography of the hill upon which it is established is still clearly identifiable.

Objectives: Historical (Conservation) Policy Area	
1	Retention and/or reinstatement of the street layout and subdivision pattern as designed by Light, Finnis & Co.
2	Development complementary to the historic character and significance of the Special Uses Zone Historic (Conservation) Policy Area.
3	Retention of all places and items (including landscape elements) which contribute to the historic character of the Special Uses Zone Historic (Conservation) Policy Area.
4	Conservation and enhancement of the historic character of the Historic (Conservation) Policy Area, through consideration of: — Streetscape character; — Subdivision pattern; — Building set-backs; — Building form and materials; and — Site layout, landscaping and fencing.
5	Maintenance of the existing topography.
6	Retention of historic townscape vistas and views.

Caravan and Tourist Park

This precinct relates to the current Gawler Caravan Park and primarily accommodates a range of tourist accommodation uses, including camping sites, caravans and cabins. Dwellings and long-term accommodation will not lead to the displacement of existing tourist accommodation in high demand locations. In rural and natural landscapes, the visual impact of the park will be minimal from scenic vantage points, public lookouts and tourist routes. Vegetation buffers and landscaping will be important in integrating the park into the landscape and to provide screening from surrounding built form, as well as reducing visual and noise impacts.

Objectives: Caravan and Tourist Park	
1	A precinct primarily for short-term tourist accommodation and associated facilities.
2	A precinct accommodating a range of short-term tourist accommodation predominantly in the form of caravan and camping sites, cabins, and transportable dwellings surrounded by open landscaped areas.
3	Development that is designed to enhance the natural features of the local environment, including visual amenity, landforms, fauna and flora.
4	Development that contributes to the desired character of the precinct.

3.1.2 Open Space Zone

The Open Space Zone is centred around the Dead Mans Pass area of the South Para river channel and floodplain. The Gawler Development Plan encourages the conservation of the natural landscape and biodiversity of the area, including enhancement of the natural character of the zone and human interaction within the zone through revegetation, construction of walking and cycling trails and other recreational activities (DPLG 2011). The primary objectives of the Open Space Zone are to (DPLG 2011):

- preserve the open space character to provide a visual contrast to the surrounding urban area;
- accommodate a range of public and private activities in an open and natural setting, including passive and active recreation and habitat conservation and restoration;
- contribute to regional open space networks and corridors (e.g., MOSS);
- promote the use, awareness and preservation of the riverine environment and the enhancement of wildlife habitats and biodiversity; and
- provide for the maintenance of stormwater capacity and flood mitigation measures.

3.1.3 Rural Living Zone

The Rural Living Zone encompasses an area north of the Gawler River between the Gawler Bypass road and the River Junction area. The development in this zone comprises primarily detached dwellings on large allotments (minimum 4 hectares) in a semi-rural environment.

3.1.4 Gawler Rivers Flood Plain Policy Area

The Flood Plain Policy Area is defined by the 1:100 year flood level, and covers a range of zoning areas, including the Special Uses and Rural Living Zones. The Policy Area provides for development, recreation, flood and erosion management and environmental protection, and includes requirements for dwellings to be set back 100m from the banks of the rivers, with floor levels set 300mm above the 1:100 year flood level.

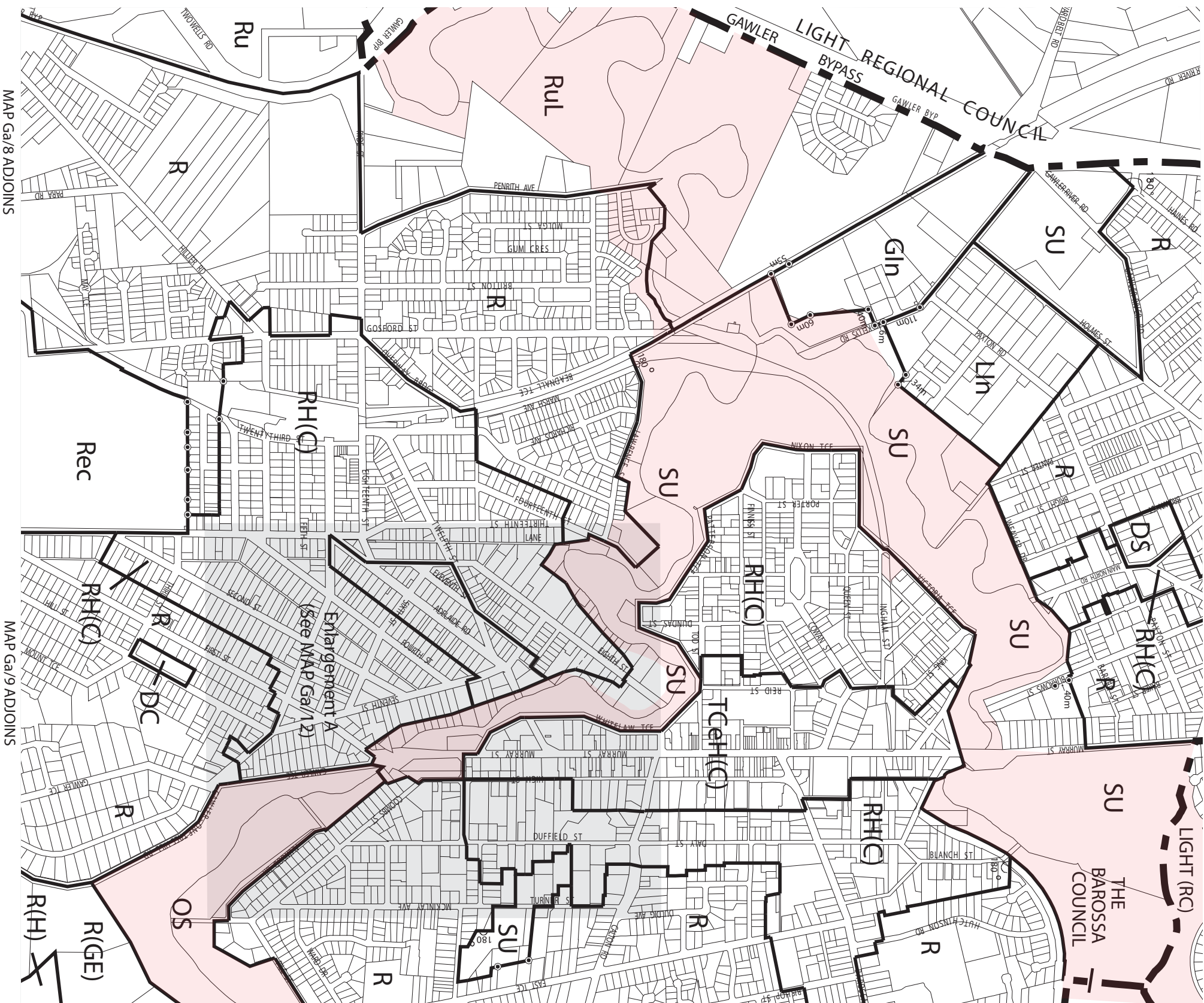


Figure 3.1 Zoning Plan

3.1.5 Gawler East Rezoning

The Gawler East rezoning (as per the Gawler East Development Plan Amendment, DPLG 2010a) covers over 200 hectares in an area formerly used for quarrying and stock grazing. The Gawler East Development Plan Amendment (DPA) separates portions of the new development into three different zones, specifically:

- Residential (Gawler East) Zone
- Residential Hills Zone
- Open Space Zone (around the South Para; see above).

The desired character of the Residential (Gawler East) Zone includes medium density housing, local services (including recreation and education) and community health services (DPLG 2011). Open space will incorporate a network of bicycle and walking trails and will be influenced by the need for stormwater detention due to the limitations on potable water in the region.

The Open Space Zone has been established with the vision of preserving the South Para River and its environs. The zone itself is to be used primarily for conservation works, as a recreation area or for sporting facilities.

The Residential Hills Zone requires that development “respects and enhances the natural attributes of the zone through the retention of significant views, creek lines, native vegetation and locations of ecological significance”, and is “designed to minimise alteration to the natural landform” (DPLG 2011).

The Gawler East DPA appears to support the development of a parklands area along the river corridor. It is important that the future open space development at Gawler East is complemented by a connected and integrated open space corridor from the existing township. This may involve the acquisition of land south of Dead Mans Pass.



3.2 LAND USE ANALYSIS

3.2.1 Land Use Framework

As was foreseen by Col. William Light, today the Town of Gawler has grown with its principal functions being:

- Regional Centre: the primary retail, administration, education and entertainment centre for the Barossa Region (Mallala, Light, Barossa and Gawler local government areas) and other northern rural areas.
- Transport Node: the point of access for regional residents into the metropolitan public transport service.
- Public Space: areas of public open space for recreational and cultural uses.
- Residential Centre: a large ‘country setting’ town within Metropolitan Adelaide.

3.2.2 Regional Centre Function

In 2003, it was estimated that the Gawler town centre served a catchment of 80,000 persons, with the figure adjusted to 90,000 for 2007. This is indicative of the town centre’s regional function, with a catchment that is 350% greater than the population of the Town of Gawler Local Government area itself.

Moreover, with projected town and regional growth, the town centre catchment will increase significantly over the coming decades. The State Government’s 30 Year Plan for Greater Adelaide (DPLG 2010) anticipates that the Barossa Region, including Gawler, is anticipated to experience a growth in population of 110,000 people over the next three decades. In addition, there is an increase of 169,000 people projected for the Northern Adelaide Region, which Gawler adjoins along its southern Council boundary.

With this anticipated growth both within its own boundaries and in adjoining areas, Gawler will find itself increasingly seen as a regional hub, with additional demands placed on commercial, retail and recreational facilities in the region likely to centre on the existing facilities and amenities in Gawler. The 30 Year Plan has also identified Gawler as a future sport hub, anticipating that the significant future growth will increase demand for sporting facilities in Gawler.

Accordingly, demand for housing and other services (e.g., health, police and emergency services, community facilities) in Gawler is highly likely to increase significantly in the coming decades, and it is anticipated that existing facilities in Gawler and the region will have to be complemented by new facilities. Previous analysis conducted as part of Gawler Racecourse DPA (DPLG 2010b) indicates that the potential for an increase in the supply of commercial/ business zoned land (see Table 3.1 below). The two key areas that interface with the Study Area are names ‘Location 1 – Willaston’ and ‘Location 6- Town Centre’.

It is of particular note that the Gawler Tourism Report (WDE 2005) identifies a lack of quality accommodation which has impacted Gawler’s ability to bid for major events and this in turn has caused a lack of drawcard attractions. Similarly, it identified a lack of business and corporate function facilities within Gawler.

It is anticipated that the increased pressure on Gawler’s facilities caused by the regional and local population increases will, inevitably, place pressure on the recreational and open space attributes of Gawler’s river corridors. It is important, therefore, that these attributes are closely managed as the communities of Gawler and surrounding regions increase their population and look to Gawler as a central location for their commercial and residential requirement, as well as their active and passive recreational needs. This may include a repurposing of existing facilities within the Gawler parklands precincts.

Table 3.1 2008 Supply Analysis

Location		Utilisation						Total
		Business Use		Other (non business)		Vacant		
Ha	%	Ha	%	Ha	%	Ha		
1	Willaston	3.17	88.8	1.7	4.8	2.3	6.4	35.7
2	Main North Road/ Tiver Road	12.3	100.0	0.0	0.0	0.0	0.0	12.3
3	Main North Road/ Hayles Road	4.0	100.0	0.0	0.0	0.0	0.0	4.0
4	Para Road	4.8	92.1	0.0	0.0	1.5	7.9	6.3
5	Gawler Belt*	8.0	70.8	0.0	0.0	3.3	29.2	11.3
6	Town Centre	3.5	100.0	0.0	0.0	0.0	0.0	3.5
TOTAL		66.8	91.4	1.7	2.3	6.6	9.0	73.1



3.2.3 Transport Node Function

New demands from an increasing population have exacerbated deficiencies in Gawler’s infrastructure system, notably its road and drainage, which have capacity limits. Previous work by Gawler Council has indicated:

- Some local roads presently carrying 2,000–3,000 vehicles per day need to be widened and reconstructed for an increase of 4–5 fold, to around 15,000 vehicles per day;
- Southern and northern link/bypass roads will be required (either local government managed or as part of the State arterial system). These will be necessary for social and economic purposes. Unless this occurs, traffic in Murray Street could increase from 20,000 vehicles per day to in excess of 40,000 vehicles; and
- The North Para/ South Para/ Gawler River system, which is the historic backbone of the drainage system, will need to be augmented and reconfigured with a stronger environmental and recreational emphasis.
- The 30 Year Plan for Greater Adelaide (DPLG 2010) identified Gawler as a major transport centre, and has identified the following initiatives to enhance transport connections:
 - The re-sleepering and electrification of the Gawler rail line – planned to be completed by 2011 and 2014/15, respectively;
 - Establishment of a Park and Ride facilities in Gawler to encourage public transport use and reduce car dependence;
 - Creation of dedicated walking and cycling routes (“Green travel corridors”) along rail corridors to promote non-vehicular transport; and
 - Extension of mass transit transport infrastructure to Roseworthy and Concordia.

July 2011 saw the commencement of the first presence of the metro Adelaide bus system in Gawler, representing a major investment by the State government and a major change for Gawler.

With a greater profile as a destination as well as a transport node feeding the wider region, Gawler will need to identify mechanisms by which public and private transport traffic can co-exist within the existing road network, and identify future opportunities to provide additional transport infrastructure to manage traffic flows in the Township.

3.2.4 Public Space

The North and South Para rivers are encompassed by recreation or reserve areas that contribute to the parkland setting of the Study Area. These areas are widely used by the local and regional community. However, the parklands are disjointed at best, with the following inconsistencies identified in land use along the river corridor:

- Surrounding the South Para at the Adelaide Road or Mill Inn Bridge, there is a significant amount of commercial and residential activity directly adjacent to the river.
- In the Goose Island area there are a number of residential allotments.
- Directly south of Dead Mans Pass there are agricultural and livestock/rural living activities.
- North of the River Junction on the North Para there are some large commercial/ industrial activities.

Gawler is part of the Gawler River Floodplain Management Authority (which comprises of the local government areas of Barossa, Light, Gawler, Mallala, Adelaide Hills and Playford). Due to the disjointed ownership of some parts of the Study Area, the provisions for flood management and mitigation are inconsistent.

The 30 Year Plan for Greater Adelaide (DPLG 2010) identifies the provision of greenways and open space networks as a key principle to adopt in the future development of the greater Adelaide region, including Gawler. In particular, the 30 Year Plan includes policies to establish a linear park (open space greenway and biodiversity corridor) along the Gawler River from Gawler to the coast by 2036, and to develop a system of open space in and around Gawler, with the three rivers as its core elements. This Master Plan contributes to these policies through the analyses and recommendations for the management, improvement and expansion of the existing open space areas along Gawler’s river corridors.

Gawler is ideally positioned to capitalise on its existing green corridors along the rivers, and extend these as future development

begins to approach the boundaries of the Town of Gawler. Gawler’s green public spaces are integral to maintaining Gawler’s image as a Country Town as envisaged by Colonel Light, and maintaining this rural character is a high priority objective. Gawler’s park lands also provide liveable community space, opportunities for physical activity and significant amenity; cool, green spaces, particularly those with flowing water or permanent open water areas such as waterholes, are recognised as valuable mechanisms by which urban temperatures can be moderated.

The 30 Year Plan has identified the following initiatives to enhance open space for aesthetic, recreational and biodiversity values:

- Re-establishing biodiversity corridors, restoring functioning ecosystems and minimising species loss;
- Providing strategically located, linked open spaces and landscaped residential and commercial areas to ensure a healthy urban ecology;
- Provide greenways (including cycle and pedestrian transport networks) along fixed-line public transit corridors and watercourses;
- Allow for expansion of the existing Metropolitan Open Space System (MOSS; this currently extends to the southern boundary of the Town of Gawler Council area) to establish a Greater Adelaide Open Space System:
 - to provide non-vehicular transport links between open space areas;
 - to provide biodiversity corridors for movement of native fauna species;
- Maintain the northern open space buffer between Gawler and Adelaide’s northern suburbs.

3.2.5 Residential Function

Gawler residential function has grown significantly, from a Country Town, to today being a significant residential growth area for metropolitan Adelaide.

In December 2007 the State Government announced a realignment of Adelaide’s urban boundary to include additional land to help meet urban development needs as the city continues to grow.

This includes three growth areas within and adjacent to the Town of Gawler:

- Evanston South & Evanston Gardens (Southern Urban Areas);
- Gawler East; and
- Concordia (to the east, within the Barossa Council).

In July 2008, the Minister for Urban Development and Planning announced the State Government would begin a process to rezone a large area of land at Gawler East, Gawler South and Evanston Park to allow for the construction of new housing and commercial development to meet the growing demand in Adelaide’s fast developing north.

Forming an extension of the eastern side of the existing town of Gawler, the Development Plan Amendment (DPA) Area Affected (‘DPA land’) extends from Calton Road at Gawler East to Potts Road at Evanston Park, and proposes to provide residential land, parks and recreational areas for up to 10,000 people. The DPA also identifies two centres, providing for a mix of retail and commercial development and community infrastructure. Integrating the development at Gawler East with the river corridors will be a key challenge that the Council will have to manage with the developers.

The State Government’s 30 Year Plan for Greater Adelaide again identified Concordia and Roseworthy (to the north, within the Light Regional Council area) as key growth areas (DPLG 2010). As stated above, the 30 Year Plan anticipates a population growth of 110,000 in the Barossa Region (including Gawler), and an increase of 169,000 in the Northern Adelaide Region, which Gawler adjoins along its southern Council boundary. This is an increase of nearly 300,000 people in these northern metropolitan/near metropolitan areas. The increased population will place increasing pressure on Council to assist in the delivery of residential development opportunities, including the zoning of land. Council will need to ensure that the existing open space areas are adequately protected from development incursion, and may wish to expand on the existing open space areas to allow for this increased pressure

Section 04 - Heritage and Culture Analysis

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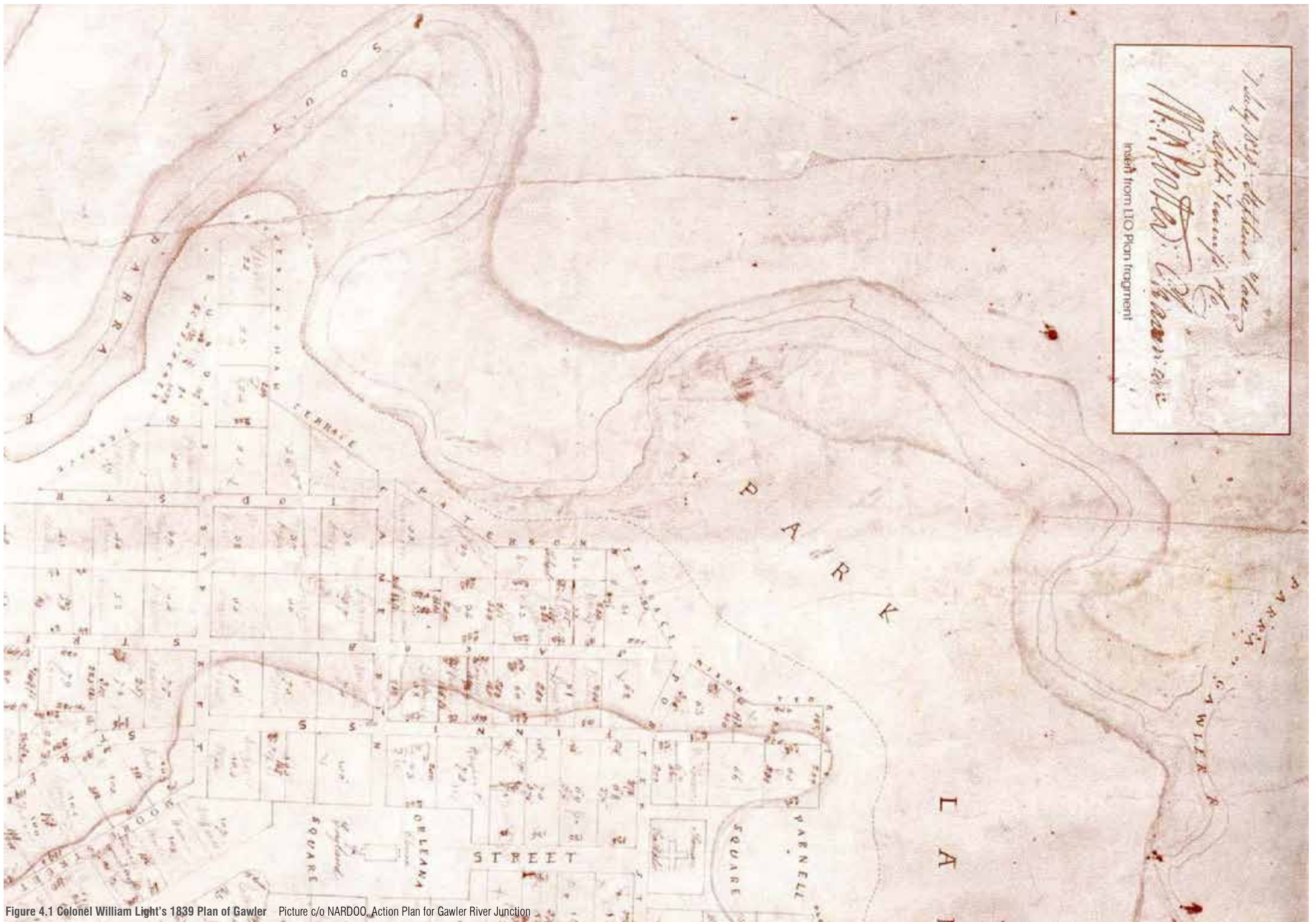


Figure 4.1 Colonel William Light's 1839 Plan of Gawler Picture c/o NARD00, Action Plan for Gawler River Junction

04 Heritage and Culture Analysis

4.1 INDIGENOUS HERITAGE

While it is not part of this scope to consider indigenous heritage in detail, the North Para, South Para and Gawler Rivers, are recognised as an important area of cultural significance for the indigenous Kurna people. The rivers as a whole are considered sacred by Kurna people, and the Clonlea Park area, in particular, has been identified as the location where the Emu Dreaming starts in Kurna country (ACHM 2010).

There are a number of significant Aboriginal sites and objects in the locality that provide confirmation of the area being occupied by the Kurna people, and it is also understood that the Gawler area was used as a meeting place for Kurna and Indigenous people from other regions (Nardoo Studio, 2002). The sheltered Gawler rivers area, with its abundant food and water resources, was frequently inhabited by Kurna groups who often moved inland in winter from more exposed locations along the coast (ACHM 2010).

The word ‘Para’ is derived from the Kurna word, ‘pari’, meaning ‘water’ (Auhl, 1976). This word is also reflected in the name for the River Junction area, Parridla Taikondi, which means “rivers coming together” (GEHA 2007), and in the name selected for the Gawler Rivers Path, Tapa Pariara. The North Para, South Para and Gawler River areas were in active use prior to colonial contact, as evidenced by numerous sites found in the banks and floodplains of these watercourses. These include painting sites, culturally modified trees, ochre quarries, fish traps, Corroboree sites, artefact sites, campsites and burial sites (ACHM 2010). Within the Study Area itself, there are several registered sites, including a number of culturally modified (scarred) River Red Gums, and an artefact scatter site.

4.2 GAWLER HISTORY

4.2.1 The Original Township Survey

The South Australian Colonisation Commissioner selected Colonel William Light as Surveyor General to not only plan the first towns of the colony (including Adelaide), but also to look for extensive ‘sheepwalks’. In this role, Light had camped several times during 1837 at a location he referred to as “Para Pass” (later to be renamed “Dead Mans Pass” – see Section 4.3) as he explored the regions further north around Lyndoch and the Barossa. Light recognised the potential for the ‘pleasant hill’ where the North and South Para Rivers converge with the Gawler River to become a key point for journeys to the north and Murray River.

In July, 1838, Light formed his own company of Light, Finniss & Co. In October of that year, Colonel George Gawler arrived to become the new Governor for South Australia, and promoted the use of Special Surveys to deal with the large numbers of people arriving that needed settlement.

In January 1839, two gentlemen, Henry Dundas Murray and John Reid arrived in South Australia. The next month, they rode out to the “Para Pass”, after Light recommended the site to them. On their return, on behalf of a private syndicate of 12, they applied for and were granted the Gawler Special Survey. The syndicate engaged the services of Light, Finniss & Co to survey and plan the area, and by July 1839, Light had finished planning Gawler township (Dutton & Elder, 1991). The form of Light’s plan for Gawler is largely due to the topography and his sensitive response to landscape. The key features of Town Acres, wide street grid design and Parklands encircling large tracts of common land (see Figure 4.1) are the hallmarks of Light’s town designs in South Australia and were responses to the deplorable conditions in London with smog and overcrowding. The town parklands comprised mostly the land subject to flooding in high floods.

Suffering from ill health, Colonel William Light died on 6 October 1839. The Town of Gawler was his last design.

4.2.2 Initial Settlement

The founding proprietors for the 4,000 acre initial Special Survey (and the Gawler township, which comprised some 240 acres of land) were:

- John Reid, an Irishman 630 Acres;
- Henry Dundas Murray, 530 Acres;
- Henry Johnson, 938 Acres soon transferred to Jerningham, Moore and Wright;
- Stephen King, 532 Acres;
- William Field Porter, 320 Acres;
- James Tod, 300 Acres;
- John Patterson and James Fotheringham, 300 Acres;
- Thomas Stubbs, 200 Acres;
- John Sutton, 100 Acres;
- Robert Todd, 100 Acres; and
- Rev. C Howard, 50 Acres.

It was John Reid and his family who became the first Europeans to settle Gawler. He did not wait for the plans, but left Adelaide to take up his 630 acres on the banks of the North Para on 16 February, 1839. The Reid family named their property “Clonlea” after an area of Ireland, first living in tents, then later in a four roomed “wattle and daub” hut. When the Reid family first arrived, they recorded that there were around 250 Indigenous (Kurna) people living in the area, and the settlers were initially wary of their indigenous neighbours. Eventually, however, some of the Kurna ended up working for the Reids, although they refused to wear any clothes given to them.

Travellers to and from the north called on the Reids for rest and refreshment. The increase of visitors following the discovery of copper in Kapunda and the bringing down of sheep and cattle from New South Wales became too much for the family to handle (Ellis & Ellis, 1974). Demand for hospitality grew to the extent that before the end of 1839, John Reid arranged for a Mr. Schiebener to build and run the “Old Spot” hotel in Murray Street. John Reid had little financial success on the Clonlea property, including a futile search for copper in Whitelaw Gully. By 1848, John Reid was almost bankrupt because of drought, falling wool prices and rabbits in the pastoral lands which he had purchased and sold most of the Clonlea farm (including the newly laid out town of Willaston), leaving only the homestead (now the site of a playground) and 40 acres of land. In an interview in 1909, Ross Reid (one of John Reid’s son) described the Gawler and Clonlea area from when the family first arrived:

“My father’s land extended over the whole of Willaston, and included the flat opposite Clonlea where we planted a garden. The scrub covered the whole of Willaston, and consisted primarily of mallee and pines. There were plenty of kangaroos, wallabies, emus and possums in those days. In Gawler, there was little timber, except on the banks of the rivers. In those days the North Para was a succession of holes, some of them forty to fifty feet deep. The Gawler Plains were covered with kangaroo grass, and in lighting a fire on our way up, the growth caught alight, and there was an immense blaze. River red gums bordered the Light, Gawler and Little Para Rivers.”

An official statement on settlement in 1840 described the Town of Gawler settlement as:

“Gawler Town is situated near the junction of the North and South Para Rivers with the River Gawler. It contains one very good inn, one public house, police barracks, two smith’s shops, six dwelling houses and 34 inhabitants.” (Coombe, 1910)

By 1840, Reid had 24½ acres under various crops, but Gawler was still little more than a “survey site with a few pine shacks and a handful of town’s people. It was part sheep walk, part farm, but mainly important as a camping and refreshment stop for travellers” (Coombe 1910) until the discovery of copper at Kapunda in late 1842.

Between 1842 and 1846, the population of Gawler was principally comprised of the early pioneers and those for whom it became an ideal stopping place for people travelling between Adelaide and the mines further north. The transportation of the ore to Port Adelaide and return trips laden with supplies used Gawler as a rest stop. A bridge had been built over the North Para in 1842, the South Para still being crossed at the ford at Dead Mans Pass (formerly Para Pass).

The original township boundaries were extended as demand started to grow in the early 1850's, including Willaston in 1848; Gawler East in 1849; Bertha in 1850; and Evanston in 1853.

By 1848, the population had grown to 300 with about 60 buildings which were “mainly along Murray Street and on Church Hill. Most of these were makeshift structures, built of cypress pine, mud bricks, stone and locally harvested limestone” (Whitelock 1989). By 1851, Gawler had a population of over 1,000, had a flour mill and two breweries, and was regarded as the “key to the north” (Yelland 1970). Light's original plan of the town was adhered to without control or oversight by any form of government, but that was soon to change.

4.2.3 Becoming a Local Government

On 1 June, 1852, the District Councils Act was passed and Gawler found itself integrated into the District of Barossa West. Gawler was split into four district council areas:

- Gawler town in Barossa West
- South of the South Para in Munno Para West and Munno Para East and
- Willaston in District Council of Mudla Wirra South (Willaston remained in Mudla Wirra until 1933, and Gawler South and Gawler West also remained separate until that date).

Dissatisfaction with the services available to the town resulted in the proclamation of the incorporation of the Municipality of the Town of Gawler on 9 July 1857, with the boundaries being those of the original town plus Gawler East, totalling 487 Acres. The town was divided into three wards, North, South and East, with one Alderman and two Councillors for each ward. The first council was appointed in 1857, with Richard Turner elected mayor.

The priorities for Council in the early years were:

- Upgrading of Murray Street, which involved large excavations at each end of to improve the gradients;
- Creation and maintenance of roads and footpaths;
- Fencing areas of the Park Lands;
- Improved drainage works; and
- Bridge construction.

Four footbridges had been constructed at various places crossing the two rivers. Bridges across the South Para on current Bridge Street and North Para at Willaston had been built in 1848 and 1849, but regularly needed repairs due to damage from flood events. Five footbridges were also constructed at various places.

In 1867 a visit from H.R.H. Prince Alfred, the Duke of Edinburgh was made to Gawler and resulted in his planting of trees in the Park Lands.

Discussions about the need for a town hall commenced in 1868, but the location and source of funding for construction were the subject of much debate. After suggestions for locating placing the town hall on portions of the Market Allotments and the Park Lands were defeated, a final poll was taken, with the majority voting for a site in Murray Street. The foundation stone was laid by Mayor James Martin on 16 April, 1878.

In early 1893, ratepayers in the District Council of Munno Para West (which included Gawler West, Bassett Town, Evanston and Gawler South, but had its headquarters in Salisbury) met to air their discontent with their Council. A chief complaint was that road and footpath making seemed exclusive to the streets in which Councillors either resided or had businesses in, with the rest of the district going without.

The Council moved at its meeting of 27 August, 1894, that the District Council of Munno Para West be approached to appoint ratepayers to meet with the Gawler Council to discuss Gawler's boundaries being extended to take in Gawler South. Eventually, the District Council of Gawler South was proclaimed as a separate council on 14 September, 1899. Amalgamation occurred in 1933. At this time, substantial areas of Willaston and Gawler East (to Cheek Avenue) were also added to Gawler Council. The remaining parts of Willaston, Evanston Park and Evanston Gardens became part of Gawler Council in 1985.

The change in name of Gawler Council to Town of Gawler was gazetted in April 2003 (Treloar, 2006).

4.2.4 Early Expansion of Gawler

Records indicate that there was an exodus of people to the Victorian Goldfields in 1851 and later the Barossa goldfields in 1868; however, the expansion of Gawler continued progressively, with the area peaking in prosperity between 1871 and 1901. By the end of this period the majority of current infrastructure, including bridges and roads, had been established and transportation services and routes had been instituted.

As the town grew and industrialisation increased, so did the demand for transportation and recreational facilities. The train line to Adelaide opened in 1857 and a tramway was built in 1879. The tramway connected the Gawler railway station to Murray Street, travelling along 19th Street then turning onto the Adelaide Road, over the South Para bridge and terminating at the northern end of Murray Street. The Gawler station had been rebuilt during 1878-9 with the original 1857 buildings demolished.

In the second half of the 19th century, telephone connection to Adelaide occurred, public baths were constructed and recreational facilities built in the Parklands, and the fire brigade was established. A town pump system was established in 1880 to supply the town with water from a large storage tank on Calton Hill and, in 1899, construction began on the Whispering Wall reservoir, which was to become Gawler's water supply. On 31 December, 1901, the valve was turned on by Mayor Charles Rebbeck to provide Gawler with water from the Barossa waterworks. The tank used previously for the Gawler pumping station was now put into service as a storage tank.

Cooperation between the Council, residents and the District Council of Munno Para West saw the building of the Goose Island footbridge in 1888. Other bridges of sorts had been erected there before, privately built and not very substantial (Coombe 1908). In April, 1889, the North Para and South Para both flooded; the North Para and Gawler Park footbridges were washed away on April 2, and the bridge at Willaston Road and footbridges at Gawler West and Goose Island were all destroyed on April 17. The 1889 floods were the worst since European settlement, and instigated a significant amount of repair works, including the construction of a temporary ford on the North Para at Willaston (after an “influential deputation” was sent to lobby the Government for funds), rebuilding the four lost footbridges, repairing the Walker Place culvert, replacing fencing and trees in the Park Lands, repairing the roof and guttering of the Exhibition Building and repairing the pier walls of the South Para bridge.

By 1892, James Martin & Co. was employing around 700 workers and May Brothers foundry about a further 300. The flour mills, though, had declining fortunes to the extent that only one remained operational, the other turning to production of compressed fodder and chaff. Lime-burning and brick making were industries that progressed well during this time. In 1890, James Martin & Co. completed the first locomotive of a 52 locomotive contract that they had won from the Government.

Council was involved with negotiations with the Government and the District Council of Mudla Wirra over the rebuilding of the Willaston road bridge. Deputations moved back and forth with discussions about the approaches to the bridge and the type of timber to be used. The relative merits of red gum, blue gum, karri and jarrah were thoroughly debated, particularly as to which timber would best resist attacks by white ants. The new bridge was officially opened by Sir John Downer on 17 September, 1890 to the joy of people on both sides of the North Para.

The South Para bridge was inspected in April, 1900 and declared to be in a dangerous condition. The relevant Government departments decided that it was up to Council to carry out any repairs and widening of the bridge at their own expense. Both Gawler and Gawler South Councils wanted a new bridge built which the Government said they could not afford that year. The bridge was not completed until early 1908 and was officially opened on the 22nd January.

In 1904, the redevelopment of the Market Allotment was considered, as it was still uncertain as to whether or not the land would ever be used as a market. Council decided to turn the land that wasn't used by the tram goods shed into a garden and fence it. A Mr. J. Woodcock designed the layout and plantings of palms, ornamental shrubs and buffalo grass. Roses were donated for planting by Warren Brothers in 1905 and a dozen more by Mr. F. Kuhlmann in 1906. At that time, the public were not allowed access to the area.



4.2.5 Parkland

The original 1839 Gawler Parklands covered the area from the North Para ford along the southern/eastern side of the river to its junction with the South Para and then along the northern/eastern side of the South Para to Murray Road. Public works programs conducted by the early Councils included the fencing of the Parklands to restrict access by stock.

The Parklands were used by the Agricultural Show Society, games of cricket and football, drill practice by the Gawler Volunteer Rifles and the pasturing of sheep, cattle and horses. Dr Richard Schomburgk of the Adelaide Botanic Gardens made an offer to supply trees for the Parklands. An avenue of Moreton Bay fig trees still stands along the South Para Park Lands, courtesy of Dr. Schomburgk. Dr Schomburgk lived on a farm at Buchfelde from 1849 to 1865, and ran a natural history museum as part of the Gawler Institute prior to becoming the Adelaide Botanic Gardens director in 1865. Over a hundred olive trees were also planted at the southern end of Murray Street to create a plantation that Council believed would be a profitable venture.

The uses within the Parklands were the subject of significant debate. A Recreation Committee had been granted the use of 16 acres of Parklands for sporting activities by Gawler Council, and debates existed over the size of the allocation and the rights of cattle owners, especially as they paid licence fees for grazing rights. During the debate that followed, it was shown that Council still retained control over the area of the Parklands referred to as the Recreation Ground. It was decided that “great cattle” were to be kept off the Recreation Ground and it was discovered that entry fees to any area of the Parklands could only be charged following an Act of Parliament.

Annual Mayors’ reports from 1879-1889 mention Council planting 3,280 trees. The plantings involved few street trees, with plantings concentrated in the Parklands, reserves, the cemeteries, and the olive plantation. To commemorate the town’s 50th jubilee in 1889, it was decided that Arbor Day would become an annual celebration. Some sugar gum trees planted as part of Arbor Day celebrations remain in the Flinders Avenue area, including the old BMX track.

Over the same period, more fencing was carried out in the Parkland, including a galvanised iron fence to enclose the Recreation Ground in January 1883 and, later, a boxthorn hedge along the river boundary. In November, 1881 an Act of Parliament was passed that allowed Council to let the Recreation Ground, but only for a maximum of eight days at a time. On 6 February, 1882, the ratepayers ratified a decision by Council to erect an Exhibition Building. In 1888, a new oval and bicycle were constructed at the Grounds.

4.3 HERITAGE PLACES

4.3.1 Heritage Protection Assessment

The historic significance of Gawler has resulted in a number of sites being registered as National, State, Local and Contributory heritage places. These ‘heritage places’ have been identified by previous heritage assessments and surveys that has led to their statutory protection. There are different levels of heritage protection as well as various types of heritage lists. Some lists provide protection for places, while others acknowledge significance but provide no statutory protection. The following levels of heritage protection apply in South Australia:

- World Heritage Places
- National Heritage Places
- Commonwealth Heritage Places
- Register of the National Estate
- State Heritage Places and State Heritage Areas
- Local Heritage Places and Local Heritage Areas (which can include contributory places).

A review of relevant statutory registers was conducted within the river corridor and within 250m of the Study Area (being a walking distance used for planning purposes) to identify places of direct and indirect relevance to the Master Planning process.

The findings were that there are:

- 2 State Heritage items within the Study Area
- 26 State Heritage items within 250 m of the river corridor
- 10 Local Heritage items within the river corridor
- 52 Local Heritage items within 250 m of the river corridor
- 282 Local Contributory items within 250 m of the river corridor.

The whole of the original town of Gawler including the original Gawler parklands and some additional land east of High Street was entered on the Register of the National Estate in 1980. Some 17 other places are entered on the Register of the National Estate within the river corridor and within 250m of the Study Area. Figure 4.2 depicts the location of all State, Local and Contributory Heritage Places within 250 metres of the Study Area and Figure 4.3 highlights the Local and State Heritage Places in the Study Area.

Based on the high numbers of heritage places within the river corridor and within walking distance of the Study Area it can be concluded that there is significant potential for the reflection and integration of heritage places into the design of the pathways and public spaces associated with the Project.

4.3.2 Clonlea Precinct

The park has one local historic significance marker, the Reid Homestead within the Clonlea Reserve.

Reid Homestead (Local Significance)

The Reid family were the first settlers of Gawler whom established a homestead on the northern bank of the North Para river where Clonlea Park is now situated. ‘Clonlea’ was named by John Reid and his family in February, 1839 (see Section 4.2). There are no remains of the homestead, although a limestone shed building remains (as rebuilt in the 1980s); the homestead site is now the Clonlea Park playground & BBQ area.

4.3.3 River Junction Precinct

The River Junction Precinct contains 4 Heritage Places:

- Exhibition Building Parklands (Local Significance)
- Angaston Line Railway Bridge (Local Significance)
- Roseworthy Line Railway Bridge (Local Significance)
- Willaston road bridge (Local Significance)

The Junction and the surrounding parklands have a strong historical link to the development of infrastructure and recreational activities in Gawler.

Exhibition Building Parklands

The exhibition building was constructed in 1882 by the Gawler Corporation following a request and contribution from the Gawler Agricultural Society. The building was opened on the 9th of November by Governor Sir W. Jervois. It has been used for a number of community based events and was even used as a roller skating rink since 1909. The exhibition building is the oldest surviving building in the Gawler Parklands. It is constructed of large random bluestone with red brick dressing.

Angaston Line Railway Bridge

The Angaston Line Railway Bridge was constructed in 1910. This bridge is significant as it retains much of its original structure and is directly associated with the opening of the Gawler to Angaston Line. It was the second extension of the Adelaide to Gawler Line which opened in 1857. Railways played a crucial part in the early development of Gawler as a significant town to the north of Adelaide.

Roseworthy Line Railway Bridge

The Roseworthy Line Railway Bridge is the oldest surviving bridge in Gawler. It is the only original bridge from the 19th century in the region that has not been destroyed by floods. The original bridge was constructed in 1859 with bluestone supports and rebuilt later with concrete supports. It still retains most of the original stonework despite alterations.

Willaston Road Bridge

There have been several bridges between Willaston and Gawler over the North Para. Several wooden bridges were erected, including one built in 1842 (destroyed by floods in 1847) and its replacement built in 1848. This latter structure was replaced by construction of a substantial iron bridge in 1869. This bridge was destroyed in the 1889 floods, which were the largest since European settlement. The current bridge was constructed with substantial sandstone foundations (provided by masons Schneemilch & Thomas) and ironwork (provided by James Martin & Co), and was opened in 1890.

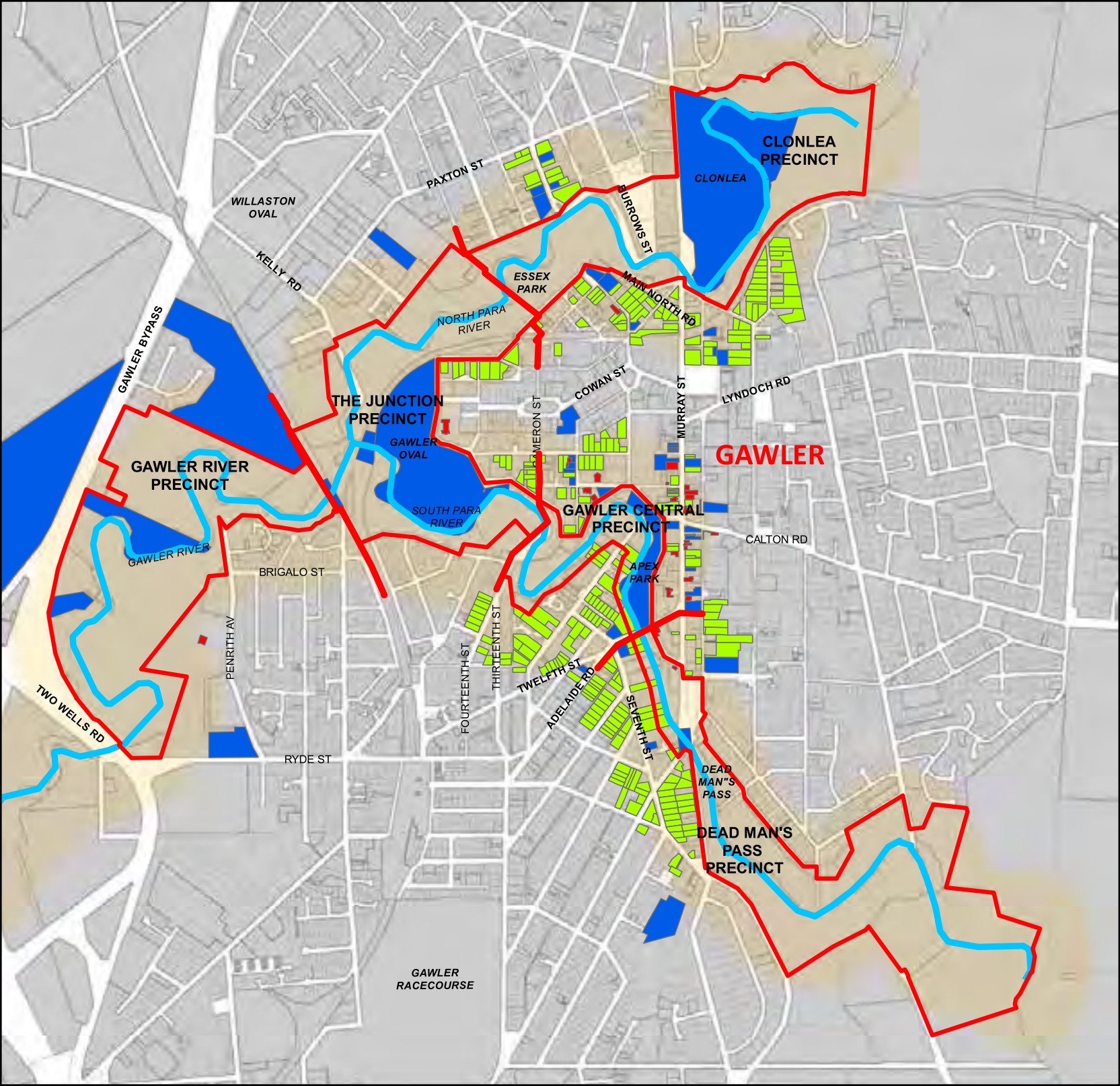
4.3.4 Gawler River Precinct

This Study Area Precinct contains 6 Heritage Place as indicated in the table below and shown in Figure 4.3.

- Five Munitions Bunkers (Local Significance)
- Air-Raid Shelter (Local Significance).

Air-Raid Shelter & Munitions Bunkers

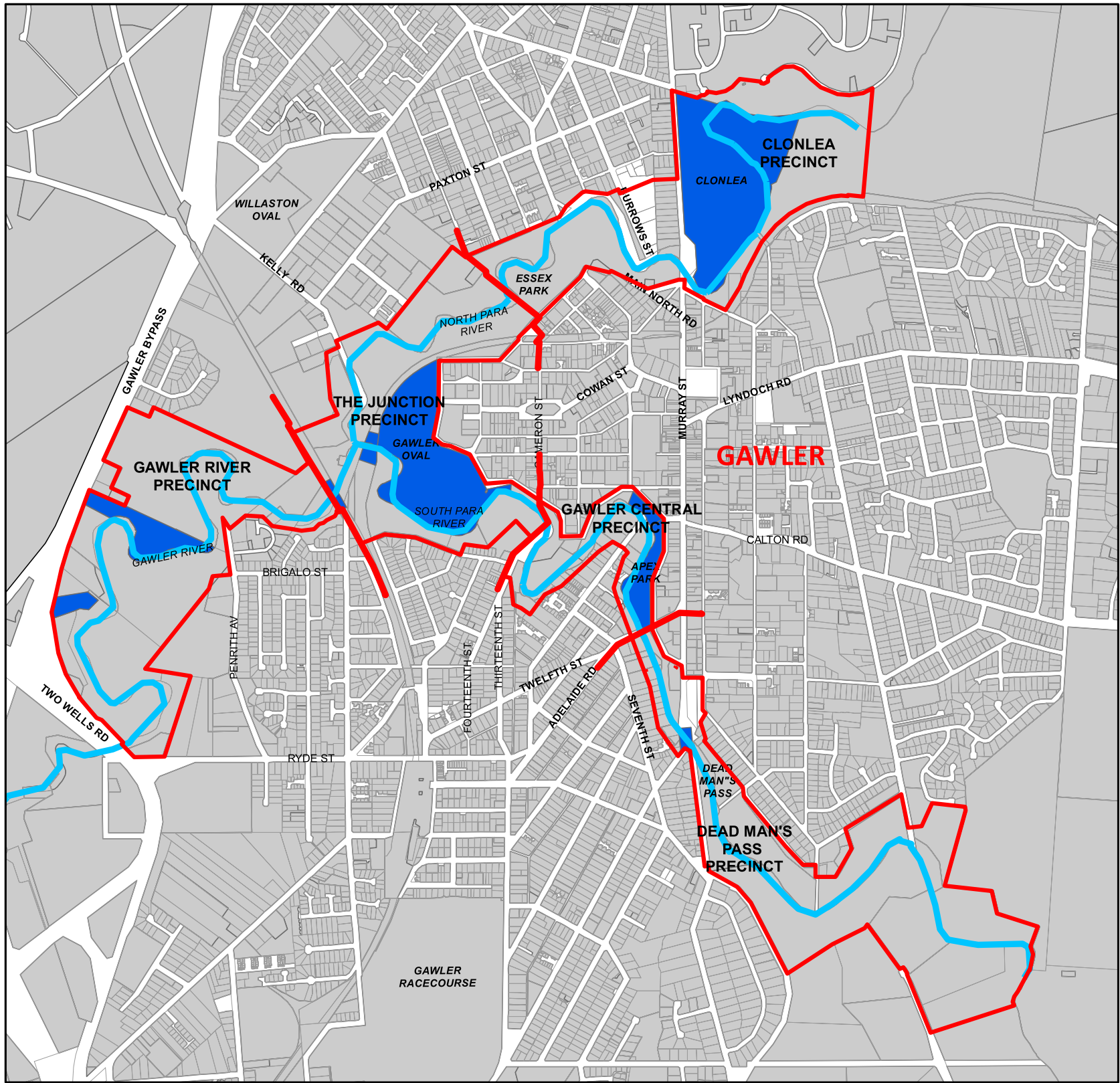
The Air-Raid Shelter and Munitions Bunkers highlight the significant contribution of the Gawler region to the war effort of World War II. There were several hundred RAAF members based in the area, for which the Air Raid Shelter provided protection, a communications facility and a dormitory. The Shelter itself is approximately 40 metres long and 9 metres wide. The Munitions Bunkers represent five of the original six bunkers constructed, and provide an important reminder of the significant war-related activities in the Gawler region during World War II.



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Figure 4.2 Heritage Places within 250m of the Study Area

Rev	A
Date	27 November 2009



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Rev A
Date 27 November 2009

Figure 4.3 Heritage Places within the Study Area



4.3.5 Gawler Central Precinct

Located in the heart of the Gawler business district, Apex Park is surrounded by heritage markers. Twelve Heritage Places has been identified; however, only three are directly located within the Study Area.

The former Wesleyan Chapel is located just outside the Study Area. However, this site has potential relevance to the connectivity of community spaces and use, will be considered as part of the future design linkage of integrating spaces, otherwise the three local Heritage significant places includes:

- Avenue of Moreton Bay Fig trees (Local Significance)
- South Para River Bridge (Local Significance)
- Statue of James Martin (Local Significance).

Avenue of Moreton Bay Fig trees

The row of Moreton Bay Fig Trees located along Julian Terrace was introduced to Gawler by botanist Dr. Richard Schomburgk in c1877 to form a grand entrance to the Town of Gawler (refer to Heritage and Culture, Section 4). This avenue also reflects the early prosperity and positive outlook of the Town of Gawler.

The Moreton Bay Fig avenue is a significant natural feature which commemorates the early work of Dr Richard Schomburgk and his close connections with the flourishing colonial town of Gawler. Dr. Schomburgk was the curator of the Gawler Institute museum and later was appointed the second Director of the Adelaide Botanic Gardens.

South Para Bridge

The South Para Bridge is one of Gawler's oldest surviving bridges. The original bridge was built in 1848 but replaced in 1869 after flood damage. In 1907, the bridge was rebuilt, and although it still used the stone supports from the 1869 bridge, it was lifted up several feet. The new bridge was opened by Governor Sir George Le Hunte on January 22 1908. This replaced the previous bridges that were both affected by flooding. It is often referred to as the Mill Inn Bridge, Gawler South Bridge or the Tramway Bridge.

Statue of James Martin

The statue of James Martin was unveiled on the 15th of August, 1903, in memory of the man hailed as 'the father of Gawler'. James Martin arrived in Gawler in 1848 and established James Martin & Co., a blacksmith which went on to construct agricultural machinery, mining equipment, and even railway locomotives. At its peak, James Martin & Co. had 700 employees and established Gawler as South Australia's most influential industrial centre away from Adelaide. He was also Mayor of Gawler five times and contributed to the foundation of the Gawler Institute. The statue was originally erected on the corner of Murray Street and Calton Road, and now sits in the park on Whitelaw Terrace overlooking Goose Island, which is locally known as the "James Martin Plaza".

4.3.6 Dead Mans Pass Precinct

Within Dead Mans pass, there are three registered heritage places:

- Former Gawler Pumping Station (State Significance)
- Former Provincial Gas Company (State Significance)
- Dead Mans Pass and Ford (Local Significance).

Dead Mans Pass and Ford

Originally named "Para Pass" by Colonel William Light, the location of Dead Mans Pass is of high historical significance to Gawler for several reasons:

Firstly, it is a well documented campsite of Colonel William Light, from which Light laid the foundations for settlement in both Gawler and the Barossa region during his surveying and exploration of the area in 1837 and again in 1839. Upon returning to Adelaide from his expedition to the future site of Gawler, Colonel Light described the region as 'the gateway to the north' with fertile land, ample water and timber which made it ideal for settlement.

Secondly, it is most famous for being the site for the burial of an unknown European man. Dr George Nott details the finding of the man in 1860 when he wrote:

“About three and twenty years ago, an exploring party sent out by Messrs, Light and Finniss, returning from the neighbourhood of the Barossa Ranges, fell in with a wanderer in the scrub, worn out with exhaustion, hunger and thirst. After relieving his wants and lifting him into their dray, they carried him as far as a ford on the South Para River, when on attempting to rouse him, they found him dead. Having no implements wherewith to dig a grave, they placed his body upright in the hollow of a tree by the river side and covered it decently with bark and sticks”.

Colonel Light then wrote of discovering the remains of the body in his “Lynedoch Diary” on the 13th January, 1839:

“Returned to the Para. Having heard of a dead body being there under an old tree, we examined the spot and found it. There is a mystery in this affair as it had been kept a secret.... His shirt on one part contained much coagulated blood. The body was covered over again and some of his clothes packed up and conveyed to Adelaide.”

Further adding to the intrigue surrounding the man’s death, the following extract is taken from the “Southern Australian”, January 16th, 1839 confirming the man’s death as being suspicious:

“Suspicious case – The body of a man, buried some time ago in the bush to the northward, was exhumed last week by Colonel Light and Mr Finniss whilst those gentleman were out on their surveying expedition, and it was found that the shirt, vest and trousers of the deceased were stained with blood, and his pockets were turned inside out. The clothes were brought to Adelaide for examination by the authorities and we hope a strict investigation into the affair will be held. At the time of the reported death of this man in the bush, many months ago, no inquest was held, as there ought to have been, and we trust the coroner will not be allowed to neglect his duty.”

This extract raises many questions about the death of the man as the blood stains found on his clothes do not reflect the death of a man who had died from exhaustion or dehydration.

The dead man made his final appearance in Gawler’s history when on the 8th May 1869, the “Bunyip” newspaper reported:

“On Tuesday last, as workmen employed on the cutting at the lower end of Murray Street were taking some earth away, they unwittingly disturbed the resting place of some relic of humanity. A skull and legbones of a man were taken from the soil by the river.”

Although the identity of the man is unknown, it is believed that the man was a sailor who had jumped ship and gotten lost in the scrub.

4.3.7 Conservation Policies for Heritage Places

Development Plan Objectives

Outside of the statutory listing of heritage places, the Gawler (CT) Development Plan (as consolidated 14 July 2011) is the main significant document for Gawler that articulates policies for the conservation of heritage places in Gawler. Also a Church Hill Management Plan plus State Heritage Places Act.

This plan indicates all of the areas within Gawler town that currently have some form of heritage zone or policy protection. The Development Plan recognises that the character of the heart of the township revolves around the Gawler town centre and adjoining Church Hill, with its character largely being derived from:

- Its setting framed by the North Para and South Para and flanked to the east by the elevated ridge running parallel with the main street, Murray Street.
- Generous parkland spaces, flanked by wide terraces, encompass the river valleys.
- Several landmarks, including the Church Hill town squares are created as significant focal points.
- Native Eucalypts on the North Para and South Para parklands are complemented within the town centre area by Moreton Bay Fig trees, Pinus species, palms and exotic European trees.

A key objective in the Development Plan is the retention and enhancement of localities in the Council area of distinctive and valued or historic significance through preservation of State and Local Heritage Places, Contributory Items and other places of historic character, and compatible infill development.

Burra Charter

The Burra Charter defines the basic principles and procedures to be followed in the conservation of heritage places. These principles and procedures can be applied to heritage places, including heritage areas. The Burra Charter has been adopted as the standard for best practice in the conservation of heritage places in Australia. Government grants for heritage places give preference to work that follows an accepted conservation philosophy such as that of The Burra Charter.

The aims of The Burra Charter are to ensure that people involved in the conservation of heritage places:

- Understand the place and its cultural significance, including its meaning to people, before making decisions about its future;
- Involve the communities associated with the place;
- Care for the culturally significant fabric and other significant attributes, taking account of all aspects of significance;
- Care for the place’s setting;
- Provide an appropriate use;
- Provide security for the place;
- Use available expertise;
- Make records of the place and changes to it, and the reasons for decisions and actions; and
- Interpret and present the place in a manner appropriate for its significance.

The existing heritage places within the Town of Gawler (i.e., those registered as being of National, State or Local significance) have been assessed as meeting the principles inherent in the Charter. It is possible that a broader area of the Gawler Parklands would be capable of demonstrating heritage value.

The principles that need demonstration are:

- These are places worth keeping because they help the community understand the past by contributing to the richness of the present environment; and are of value to future generations.
- The physical fabric or ‘setting’ of the place and its use is of cultural significance of a place is embodied in its physical material (fabric), its setting and its contents and gives meaning to people.

Importantly to the Master Planning of the Gawler Urban Rivers, is that the Burra Charter advocates a cautious approach to changing a place, including:

- Doing as much work as is necessary to repair and secure and to make it function, but as little as possible so the history of the place can continue to be recognised in its physical material (fabric).
- The use, management and change at a place are guided by a conservation policy prepared following the assessment of significance and the investigation of the issues affecting the future of the place.

It is necessary for techniques to be developed for how these places can be used and how they should be cared for.

The essential steps recommended in the Charter include:

- Assess Cultural Significance – including the collect information about the place, analyse information including comparison with other places, and decide what is significant about the place;
- Develop Conservation Policy and Strategy – including collect information about the issues affecting the future of the place, analyse information and consider options, prepare a conservation policy which addresses all the issues, and decide upon a conservation strategy to carry out the policy;
- Carry out the Conservation Strategy.

Refer to Sections 8 and 9 for opportunities and recommendations regarding heritage management in the Study Area.



Section 05 - Recreational Analysis

The background of the slide is a solid blue gradient. Overlaid on this are several thin, white, curved lines that sweep across the frame from the bottom left towards the top right, creating a sense of motion and depth.

5.1 COMMUNITY IMPORTANCE

Recreation and sport are important elements of any community. Recreation and sport make major contributions to the economic, cultural and social wellbeing of Gawler and, as the town grows, must continue to do so. Recreation is defined as any activity that a person chooses to participate in during their free time for enjoyment or relaxation. Activities comprise pursuits such as:

- Taking a walk
- Riding a bike
- Playing at a playground
- 'Casual sport', which are not undertaken in a structured competitive setting, such as having a social game of tennis or golf.

Sport is defined as physical activities that are undertaken in a structured and competitive setting and the Gawler Parklands are an opportunity to improve the provision of sport opportunities in the Town.

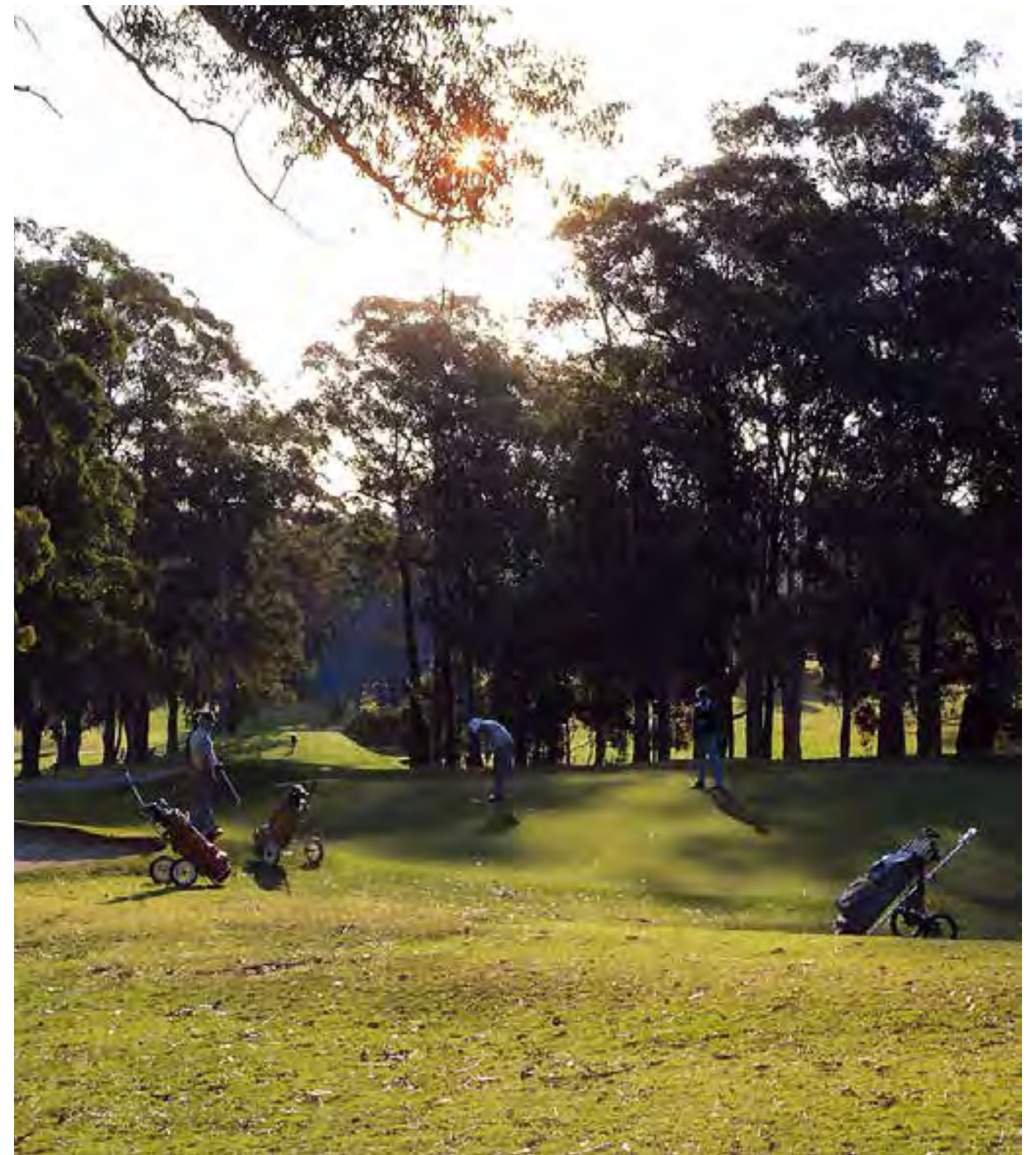
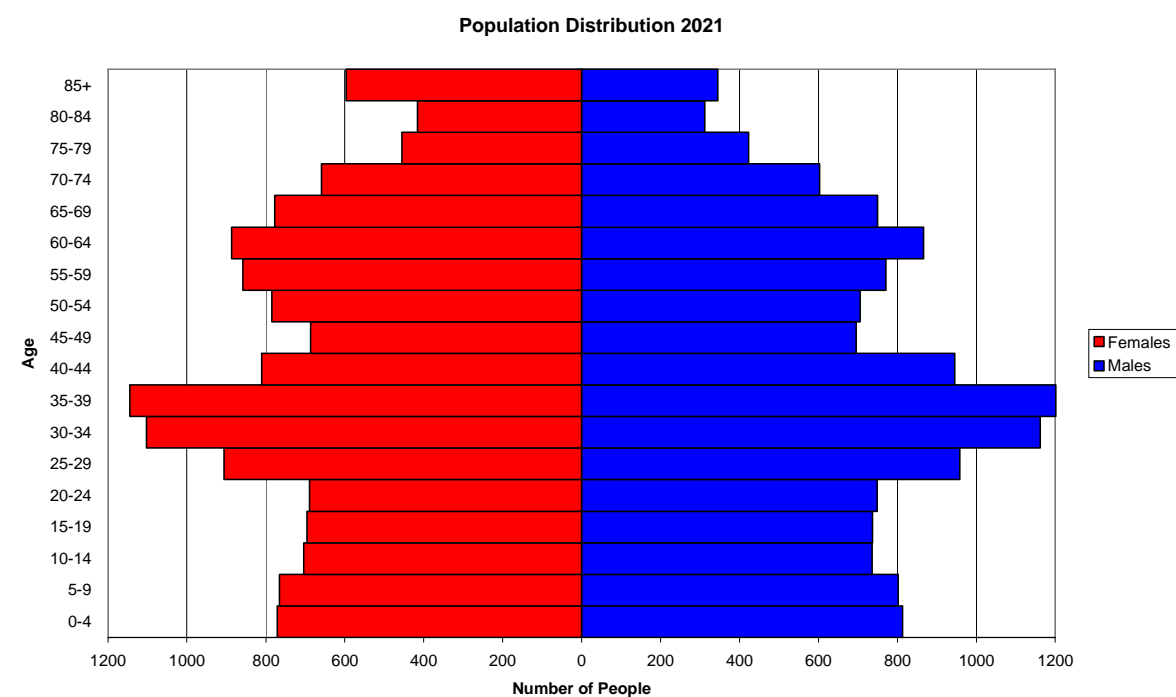
5.2 ANALYSIS AND BACKGROUND

5.2.1 Community Demographics

Population

There are more than 21,000 people living in the Gawler Local Government Area (ABS 2011). The population of the Gawler LGA has increased by 15% since 2001 (ABS 2011), with a view to a possible increase of 35,000 by 2017 (SA Strategic Plan).

There has been an ageing of the population, with the median age increasing to 39.





Recreation Facilities Catchment Definition

Given the regional function that Gawler plays, it draws on a much greater population from within a wider catchment and for the purpose of the recreation assessment; the catchment is defined in Table 5.1 below. It should be noted that in 2009-2010, the Playford Local Government Area was the fastest growing LGA, and Salisbury LGA had the second-largest growth of any South Australian LGA after the Onkaparinga LGA (ABS 2011). Although Salisbury is generally considered as being outside the Gawler catchment, this significant growth on Gawler’s southern boundary will, in concert with the growth within and around the Gawler LGA, place increased pressure on Gawler’s facilities.

The population of Gawler is projected to increase to 35,000 by 2017 and with this a significant increase of 45% offers the challenges of provision of infrastructure and service to pin the number of middle aged and older people.

Table 5.1 Regional Recreation Catchment

Statistical Local Government Area	Population (2006 Census)		State Rank 2009 – 2010	
	No.	persons/km ²	Fastest Growth	Largest Growth
Gawler (T)	20,257	493.0	18	19
Playford (C) - Hills	3,562	26.5	1	3
Playford (C) - West	10,503	62.0		
Barossa (DC) Angaston	8,588	38.6	13	13
Barossa (DC) - Barossa	8,610	13.8		
Barossa (DC) - Tanunda	4,974	105.1		
Light (RegC)	13,318	10.4	4	18
Mallala (DC)	8,365	9.0	12	28
Salisbury (C)			10	2
Total Catchment	78,177	68.9 (Avg)		

The 2006 Census gives an insight into the popularity of passive recreation (walking and cycling) in Gawler. Of the 6,945 residents that travelled to work on the day of the Census, their mode of transport was as follows:

- 218 people walked (2.64%)
- 23 people cycled (0.28%)

These statistics indicate that very few people walk or cycle as a regular mode of transport in Gawler. In comparison to the Adelaide Statistical division in which:

- 13,508 people walked (2.65%)
- 6,476 people cycled (1.27%)

It is surprising that there are so few cyclists in Gawler given the proximity of residential areas to places of employment. This suggests that the major upgrades provided by the Gawler Urban Rivers Project will increase the use and utility and of the non-vehicular transport network in Gawler. Further upgrades to the pedestrian and cycling network may also be required to link in other areas of Gawler beyond the river corridors. High traffic volumes and heavy vehicles are seen as important factors in reducing the number of pedestrians and cyclists in Gawler as they create a noisy and polluted environment for such users. It is also noted that there is a lack of quality, designated footpaths and bicycle lanes that often force users onto the dangerous roads (QED 2008).

The NEXY/Gawler Bypass was constructed to divert through traffic from the Gawler township, preventing traffic entering the town centre and causing congestion.

5.2.2 Recreation and Sport Trends

This section covers the demographic shift and collection from surrounding towns. Gawler will be the vibrant centre offering neighbouring towns' services and facilities such as sporting complexes and grounds made accessible by improved transport and access.

Shift to Unstructured Activity

Nationally, there is evidence to show that participation patterns in sport and recreation-based activities are changing in response to a number of factors, including:

- Shifting demographics;
- Technology utilisation;
- Shift away from organised, structured sports and
- Growth in eco-tourism.

The shift away from organised and structured sports is a function of the growing perception that people don't have time to commit to organised group activities. This is driving a trend towards more individual pursuits in:

- Less structured activities and
- 'Pay and play' activities.

These less structured opportunities will become more important with demographic changes such as:

- With the ageing population and increasing life expectancy, the provision of sport and recreation pursuits suited to aged people will become growingly important;
- With changes in employment patterns (such as growth in part time work) and working hours (extended trading hours), the timing available for the working population for commitments to organised sport and recreation is changing and
- With young people becoming more and more part of the workforce, people of these ages will growingly leave organised activity to take up part time employment;

It is also important to recognise that what can be termed more 'traditional' sport and recreation activities are now competing with activities such as:

- Computer games and the internet;
- Commercial sport and recreation activities such as indoor rock climbing and
- New cultural activities such as bocce/ petanque

It is important that recreational planning within Gawler recognises these trends so that it can provide for the long term needs of its community.

Participation Rates

Approximately 79.3% of South Australians over the age of 15 participate in exercise, recreation and sport with:

- Participation highest in the 15-24 years;
- More than 70% of females in the mid age (35-44 years) and early retiring age (55-64 years) groups participating and
- The vast majority of all participants, participating between 1x weekly (64.8%) and 3x weekly (41.2%).

In line with recent trends around Australia, organised participation only accounts for 37.7% of all participants, with:

- Most of these participants (two thirds) being involved in sport/recreation clubs or associations and
- A lesser number (one third) being involved with fitness, leisure and indoor centres.

Participation rates in sport and recreation-based activities have changed and, while structured sport and recreation facilities are still considered important, access to unstructured facilities at the community level are of significant and growing importance to most South Australians.



Preferred Activities

Research suggests that there are three key motivators for adults to be active:

- Health & Fitness;
- Enjoyment and
- Wellbeing .

In line with this motivation and the trend for unstructured participation, walking is the most significant preferred method by which adults participate, with cycling and running also being important activities, as shown in Table 5.2 below.

Table 5.2: Participation Preferences SA, 2007

Activity	%
Walking	34
Aerobics/fitness	34
Cycling	8.4
Swimming	7.6
Running	6.4
Tennis	5.8
Bush Walking	5.1
Golf	4.3
Netball	4.2
Australian Football	3.8

Suitable walking/cycling and running pathways and trail networks in South Australia are therefore important infrastructure elements for South Australians to keep active.

Trails Research

Types of Trail Users

A study into the uses and users of trails (Market Equity, 2004) found that the primary reasons given for trail use are:

- To exercise and get fit and
- To undertakes some form of recreation and leisure.
- Trail participants are looking for the following benefits in using trails:
 - A sense of well being (95%);
 - Opportunities to unwind and relax (91%);
 - Being close to nature (87%);
 - Spending time with family and friends (70%) and
 - Spending time by themselves (61%).

Part of Council's Strategic Plan is to develop linear parkland and to integrate into a network of paths and trails. This not only promotes a healthy active lifestyle but also interaction with Gawler's natural and unique parkland assets.

There are generically five types of trail users. The Market Equity research provides a useful indication of the extent to which these users represent all trail users and the reasons for the trail use.

Table 5.3 Trail Use Drivers

Type	Class	% Users	Reason for Use
Social	Recreation	14%	Seek to spend time with friends and family/ Trail is not central to their use, but important to why they visit an area.
Uninvolved	Recreation	20%	Do not consciously use trails. Use the trail to access other areas for 'leisure' purposes.
Trail Lovers	Recreation	27%	Use the trail for the pleasure and benefits it offers.
Choice Commuters	Exercise	24%	Use trails to get to their destinations, walking or cycling as an alternative to roads and other transport.
Exercise Enthusiasts	Exercise	15%	Use the trail specifically to get fit.

The size and location of the Gawler Parklands is such that it is able to target most user types as it can provide cycle and walking paths that provide for:

- Access to formalised and unstructured leisure facilities;
- Access to destinations within the Town of Gawler, particularly offering off road connectivity across the river;
- User pleasure and benefit through interacting with the historic fabric of the Town, ecological values, and via connectivity with well known regional trail networks and
- Integration with open space areas with facilities that encourage family and friends to spend time together and other areas where individuals can gain spend time alone.

5.3 OPEN SPACE / SPORTING FACILITIES / RECREATION INVENTORY

Since the inclusion of parklands and open space in Colonel Light’s original town plan, recreation based activities have been closely linked with the Town Centre. Sport and recreation are today important components of community life in the Town of Gawler.

The Town of Gawler has a range of existing sport and recreational facilities, and these are best described in three parts:

- Public open space;
- Sporting facilities; and
- Paths / tracks / trails.

5.3.1 Public/Open Space

The spatial distribution of public open space is shown on Figure 5.1. It is evident that the majority of public open space essentially forms public land which abuts the major river systems which converge in the heart of Gawler, these being the South Para, North Para and Gawler River.

The majority of open space which is located within or adjacent to the Study Area is in the form of local reserves, which are primarily used for passive recreation purposes. In particular open space adjoining the Study Area consists of linear trails which abut the major river and creek systems of the area.

These linear trails converge on the town centre of Gawler.

The major reserves are the Dead Mans Pass Reserve, which borders the South Para, and Clonlea Park, on the North Para. These reserves provide larger areas of open space for passive recreational pursuits.

5.3.2 Sporting Facilities

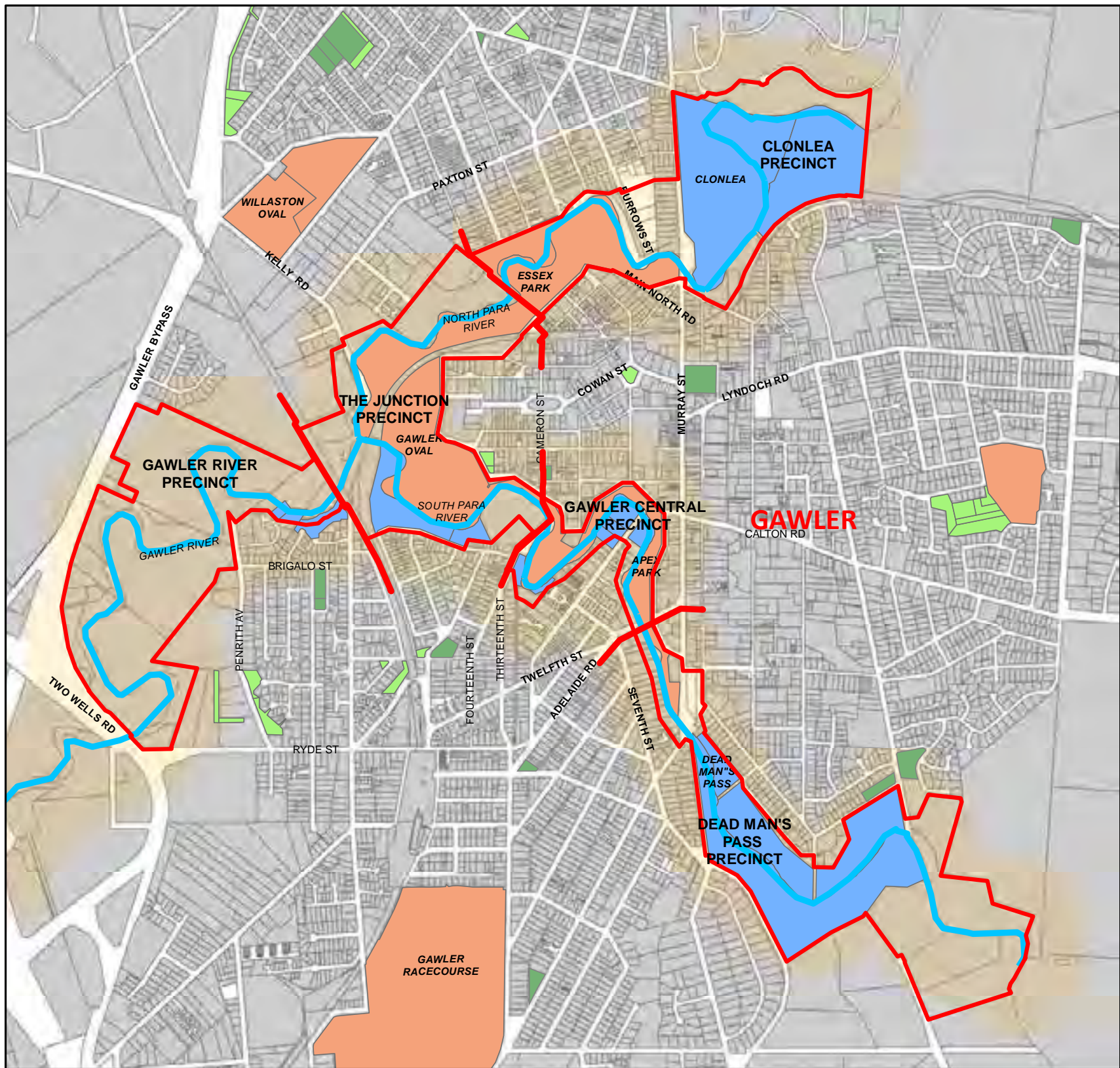
Major sporting facilities servicing the township of Gawler are generally concentrated within and adjacent to Essex Park, immediately to the west of the Gawler Town Centre. Facilities concentrated in this location include:

- golf course;
- croquet lawn;
- lawn bowls rinks;
- netball courts;
- Gawler Recreation Centre;
- Gawler Showgrounds;
- the Gawler Greyhound Track; and
- Ovals.

Table 5.4 provides a summary of the sporting facilities throughout the Gawler region with traditional sports most widely represented.

Table 5.4 Sporting Facilities

Sporting Category	Town of Gawler (No)	Within 250m (No)	Within Study Area (No)
Football (Oval)	4	1	1
Cricket Grounds/Nets	4	1	1
Netball	6	3	2
Basketball	1	0	0
Golf Course	1	1	1
Swimming Pool	2	1	1
Tennis	8	3	2
Athletics	1	1	1
Volleyball	1	0	0
Lawn Bowls	1	1	1
Soccer Pitch			
BMX Track	1	0	0
Equestrian Sports	1	0	0
Shooting Facilities			
Hockey Facilities			
Skate Park	1	1	1
Petanque	1	1	1
Pigeon Racing	1	1	1
Croquet	1	1	1
Squash	1	0	0



LEGEND

- Study Area
- River
- 250m Influence Zone
- OPEN SPACE
- Informal
- Landscape
- Linear
- Sports
- Waterway

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Date 27 November 2009

Figure 5.1 Open Space Areas within the Study Area

Table 5.5 Major Organised Sporting Facilities, Town of Gawler

Recreation Facility	Activities	Organisations
Trevor Belchambers Swimming Centre	Swimming (Competitive & Recreational)	Gawler Amateur Swimming Club
G & DTA Tennis Club	Tennis, Calisthenics	Gawler & District Tennis Association, Gawler Calisthenic Club
Gawler Petanque Club	Petanque	Gawler Petanque Club
Gawler Bowling Club	Lawn Bowls	Gawler Bowling Club, Gawler Para Ladies Probus Club, Probus Club of Gawler
Gawler Croquet Club	Croquet, Bridge	Gawler Croquet Club
Gawler Par 3 Golf Course	Golf	Gawler Par 3 Golf & Social Club
G & DNA Netball Club	Netball	Gawler & District Netball Association, Gumnuts Netball Club, St George's Netball Club, Xavier Saints Netball Club
Princes Park	Skating, Pigeon Racing, Passive Recreation	Para Invitation Homing Club
Gawler Sport & Community Centre	Roller Skating, Netball, Gymnastics, Dance, Martial Arts, Fitness Classes, Art, Music, After School/School Holiday Care, Special Events	Alan's Dance Studio, Gawler Academy of Dance, Gawler Irish Dance Club, Pure Funk Dance Studios, Gawler Gymnastics Club, Gawler Judo Club, Japan Karate Association, Kindermusik
Gawler Oval	Greyhound Racing, Cricket, Football, Tennis, Netball, Agricultural Shows	Gawler Greyhound Racing Club, Gawler Central Sporting Club, Waratah Centrals Tennis Club

5.3.3 Other Recreation Facilities

Table 5.6 below indicates the recreational facilities available within the Study Area and the organisations that utilise the facilities. It can be seen that there a number of diverse active recreation activities available in Gawler.

Table 5.6 Recreation Facilities

Recreation Facility	Activities	Organisations
Clonlea	Playground, Tennis Courts, Picnic Area, Barbeque Facilities, Passive Recreation	N/A
Henry Chenoweth Park	Passive Recreation	N/A
Gawler Central	Playground, Picnic Area, Barbeque Facilities, Passive Recreation	N/A
Dead Mans Pass	Dog Exercise Area, Passive Recreation	N/A

5.3.4 Cycling/Walking/ Heritage Trails

While there appear to be limited trails within the Study Area, there are existing passive recreation paths in:

- Clonlea Park;
- Dead Mans Pass;
- The River Junction and
- Tingara Reserve.

The construction of walking and cycling paths as part of the Gawler Urban Rivers Project, linking all of the passive and active recreation areas along the North Para and South Para river channels and floodplains, provides a connectivity throughout the Town of Gawler that will promote the reduction of car use within the municipal areas.

There are a number of established heritage walking trail initiatives that have been created to facilitate a better understanding of the historical significance of Gawler. These include:

- Church Hill State Heritage Walking Tour – the route which explores the historic town area, and brings attention to 19 heritage places;
- Historic Main Street Walking Tour - the route is focused in and around Murray Street and discovers 30 heritage places and contributory items;
- Heritage Hotel Tour – the route covers 10 hotels throughout the Gawler area.
- The integration and enhancement of the existing heritage networks should be considered in future implemented works, most specifically:
- The proximity of the Church Hill State Heritage Area to the Study Area, suggests that any heritage initiatives initiated should be integrated with the Church Hill Area to maximise the potential for the improvement of cultural and historical awareness, particularly considering it is one of only 17 State Heritage Areas;
- While elements of the Main Street Walking Tour are of some distance from the Study Area; there are some items of significance in a close proximity to the South Para including Dead Mans Pass, South Para Bridge, Gawler Central and James Martin Statue;
- The Southern Hotel, Kingsford Hotel and Old Spot Hotel are located in a close proximity to the South Para and offer the potential for integration into any future heritage related initiatives, particularly considering that the Old Spot Hotel was the first public house constructed in Gawler.

5.4 GAPS ANALYSIS: OPEN SPACE, SPORT & RECREATION

As the population and the township footprint grows in line with projections, so will the demand for public open space, sport and recreational facilities. There have been two previous, but somewhat outdated, studies that assessed the recreation based needs of the Gawler community.

5.4.1 Community Studies

The first study was Gawler Area Community Needs Study, undertaken by Ransom & Water in 1978. The second study undertaken was Community Needs Study, by Philip Gray and Associates in 1991.

These studies found that:

- Gawler was well served by a variety of sporting clubs (1991 study), and
- The level of satisfaction of recreation facilities was generally high.

The top five improvements desired by residents in the area in 1978 were:

- Recreation Centre (28%)
- 10-Pin Bowling Centre (19%)
- Squash Facilities (17%)
- Oval at Evanston Park (14%)
- Soccer Facilities (12%).

It should be noted that the Gawler Sport and Community Centre was redeveloped in 1988 to incorporate a new two-court stadium, studio and meeting facilities.

The 1991 study found that the activities or facilities that were regarded as most lacking were:

- Heated Indoor Swimming Pool (11%)
- Cinema (6%)
- Tennis Courts with Lighting (4%)
- Indoor Recreation Facilities (4%).

These previous reports also indicated:

- A perception that the majority of financial support was being directed to traditional sporting activities;
- Some dissatisfaction existed with a quality of local parks and playgrounds, most particularly in newer residential areas;
- The swimming pool was in need of upgrading but the development of a new regional aquatic centre should be investigated; and
- The improvement of passive recreation was seen as the most significant opportunity for the upgrade of recreational facilities in Gawler.

It is recommended that the community needs study be updated as the needs of the community will have changed significantly over time. This said, an improved swimming facility and the construction of a skate park appear to be the priority amongst the majority of the community and future funding towards active recreation facilities should reflect this.



5.4.2 Public Open Space

The provision of open space while often provided on a standards basis, e.g. open space contributions as part of subdivision, there is growing acknowledgement that the provision of open space should be provided on a community-needs basis.

The provision of open space is intrinsic to the lifestyle and image for Gawler (“The Best of Town & Country”) which provides a feature that frames the urban township. The protection of this sense of openness and country is important to the promotion of Gawler as a liveable place and needs to be protected.

In addition, public open space is also required for the:

- Provision of recreational opportunities;
- Protection, preservation and enhancement of biodiversity, conservation, habitat and heritage places;
- Protection and enhancement of landscapes and amenity;
- Educational, scientific and other research opportunities;
- Provision and management of utilities and services;
- Ensuring opportunities exist to meet unforeseen needs and
- Contribution to the liveability and appeal of the municipality for residents and visitors.

Types of Open Space

There are catchments which public open space needs to serve:

- Local open spaces are sites which because of their generally small size, the similarity of the uses made of them and/or their high frequency of provision, predominantly or totally serve individual neighbourhoods or suburbs. Small playgrounds, ball sport kick-a-bout areas and neighbourhood pathways are common local open spaces which reflect their community of interest.
- Sub-regional open spaces are sites, which by virtue of their larger size, more specialised uses and/or less frequent level of provision, serve substantial districts. Many sports facilities, large playgrounds and large informal parks serve a sub-regional role.
- Regional open spaces are sites which because of their large size; mix of uses; specialisation of use; standard of provision; environmental, heritage, amenity or other special significance, draw from a broader catchment than the local community. In some instances they serve the whole of Town and areas well beyond. Botanic gardens, golf courses, state and national competition level sports grounds, racetracks and long-distance linear trails are typical regional open spaces.

Use of Public Open Space

There are many forms that public open space takes to meet the various needs of the catchment. These are generally:

- Linear and Linkage Open Space: consisting of cycle and pedestrian paths, off and on road cycling reservations, unused road reservations, service easements, and relevant sections of other open space categories which provide local, sub-regional and/or regional linear reserves, routes and links. These are predominantly for human use but may also be wildlife corridors. Some habitat linear links may cross private land (e.g. along creek alignments).
- Sports Open Spaces: are sites predominantly used for active, competitive recreation. They may also contribute to passive recreation and environmental values of the area. They include sports grounds for a wide range of team and individual competitions, golf courses, tennis courts, race tracks, outdoor courts, rowing courses, equestrian courses, outdoor pools, rifle ranges, lawn bowls and outdoor sports facilities at schools. Sports open spaces can have a range of other recreation facilities and support amenities associated with them including halls and sports stadia, clubrooms, management buildings, toilet/change facilities, carparks, playgrounds, BBQs, and informal gardens. Some areas designated as sports provide an open space function although they are on private land (e.g. private golf courses).
- Informal Parks: are sites which have been developed to meet a range of non-competitive recreational pursuits in a predominantly informal setting. In addition to providing passive recreation opportunities, informal parks also make a significant contribution to amenity and environmental values. Informal Parks include playgrounds and vantage points which support activities such as walking, cycling, rollerblading, BMX, horse riding, exercising dogs, children’s and adult play, picnicking, sightseeing, locations for social and cultural events as well as artistic activities and relaxing. Indoor recreation facilities and support amenities such as halls, tourism destinations, clubs, toilets etc may be provided in association with the outdoor uses.
- Landscape and Amenity Open Spaces: are defined as sites which have landscape and amenity features and/or components, which require reservation and protection ahead of use for other purposes. Landscape and Amenity Open Spaces include buffer areas between differing land use zones, small garden and tree plantings in retail areas, rural fringe areas protected to provide scenic views and ridge lines which provide a backdrop to urban land uses.
- Conservation, Habitat and Heritage Open Spaces: are defined as natural and cultural heritage places which have features and/or components which are of local, sub-regional or regional significance and which warrant protection ahead of their use for other purposes. Conservation, Habitat and Heritage Open Spaces include areas of natural vegetation, botanic gardens and sites which record Aboriginal and European settlement and use of the land.
- Waterway and Lake Open Spaces: are creeks, rivers and lakes and the land areas associated with them (e.g. floodplains) which warrant protection ahead of their use for other purposes. Waterway and Lake open spaces serve a wide range of purposes including recreational use, transport, water system management, habitat protection and amenity.
- Utilities and Services Open Spaces: are reserves established to accommodate a range of essential urban and rural services. These include flood management, water catchments, forest harvesting, fire surveillance and control, road development, utilities easements (power, water, and gas), sand extraction and other mining activities, airports and noise impact zones.
- Future Use Open Spaces: are developed or undeveloped sites that have been or are to be reserved to ensure adequate future provision of each of the other Open Space categories in response to changing demographics and leisure needs. The future designation of these sites for recreation purposes will be subject to investigation into issues of biodiversity, archaeology, aboriginal and post European contact heritage, soil stability and potential contamination from previous uses.

5.4.3 Walking / Cycling Trails

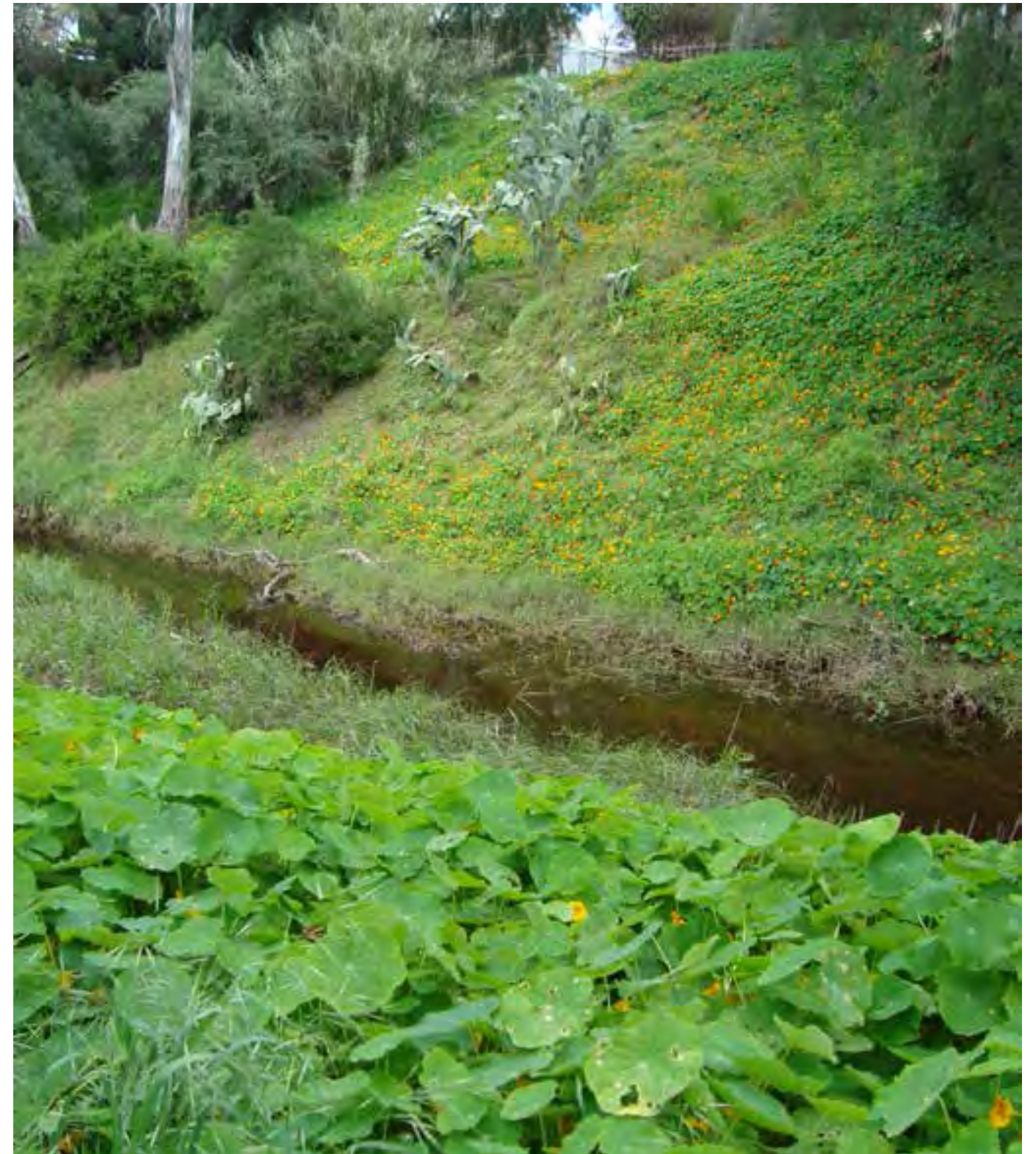
Previous investigations in 2008 (QED 2008) identified gaps within the Town of Gawler's walking and cycling trails including:

- There are few established walking and cycling facilities within the river corridors and reserves;
- Existing paths in Clonlea Park, Dead Mans Pass, near the river junction and at Tingara Reserve are used for passive recreation;
- Paths along the rivers are not signed for cyclists and are not properly designated for cyclists;
- A new BMX track has been constructed near the Scout Hall at Elliot Goodger Park (replacing an old one near the ford at Murray Road);
- There is a lack of bicycle parking in key locations;
- There is no specific location set aside of mountain bike riding and this is resulting in these users riding in Clonlea Park and Dead Mans Pass and causing damage to remnant and native vegetation. The closest alternative is the Mawson Trail which is 20km from Gawler.

The QED report recommended a walking and cycling network upgrade and a proposed a detailed river corridor alignment. These investigations also identified the opportunities available for improvement to the cycle and walking network. The opportunities included:

- All of the Township of Gawler was within an 800m (10 minute ride) cycling distance of parks and reserves;
- Most of the township is within 250m (10 min walk) walking distance of parks and reserves;
- Off road routes along river corridors for recreational use and for providing walking and cycling routes to link key destinations.

The Gawler Urban Rivers Project has delivered approximately 11km of walking and cycling trails (the Gawler Rivers Path, or Tapa Pariara) to address these issues. The trails constructed as part of this project provide a link between the open space along the North Para (at Clonlea and Hewitt) to open space along the South Para (at Dead Mans Pass), with trails and bridges providing access through the river corridors and close to the town centre. These trails have been designed to provide links to existing facilities, with the potential to provide future links to adjoining regions, including Adelaide's northern suburbs (via the Northern Expressway), Willaston, Gawler East, the Barossa and beyond.





5.4.4 Sporting Facilities

Planning Guideline

While there is no recent recreational data of catchments for the variety of sporting facilities within Gawler, to assist formulate recommendations that will have some meaningful outcome, facilities are classified below based on a ‘likely’ catchment hierarchy:

- Regional;
- Local Government Area;
- Neighbourhood; and
- Local.

Figure 5.7 Criteria for classification of Sports Facilities

Criteria	Regional	Local Government Area	Neighborhood	Local
Likely Population Catchment	80,000 – 20,000	20,000 persons	8,000 – 20,000 persons	Less than 8,000
Capability	Host	Homes for	Host	Host
	Elite events	Clubs	Senior Grade Sports	Junior Grade or Nil
Quality & Scale	National/ Intern’tl	Major Council Expend	Mod.Council Expend	Minor Council Expend
Likely Participation Level	High	Medium - High	Average - Medium	Low

Quantitative Standards

Although the Town of Gawler does not appear to have developed guidelines or standards for the provision of recreational facilities, in the absence of a community needs assessment, we have assessed the adequacy of provision against standards and is able to be used to provide a basic level view of how well the facilities available are meeting the needs of its residents and how well the Town of Gawler is capitalising on its regional function in respect of sport and recreation.

Figure 5.8 Quantitative Analysis of Supply

Facility Type	Quantitative Standard	Gawler Theory
Sport Pitches	1.2 ha/1000p	24
All Outdoor Sport (including pitches)	1.6 ha/1000p	32
Children Play Spaces	0.25 ha/1000p	5
Amenity green space	0.55/1000p	11
Winter Sports Oval	1.2/1000p	24
Tennis, Netball, Basketball	1.2/1000p	24
Regional Sports Facility	0.3/1000p	6
		24 (catchment)
ClubHouses	1 per 4 ovals 1 per 6 courts	

The desktop assessment indicates that Gawler is well serviced in respect of the provision of sporting facilities, although the spatial review suggests that some areas (particularly areas in which new development is planned) will have some investment requirements.

Section 06 - Biodiversity and Environmental Analysis

The background is a solid light blue color. Two thin, white, curved lines originate from the left side of the image. One line curves upwards and to the right, while the other curves downwards and to the right, creating a sense of movement and flow.

06 Biodiversity and Environmental Analysis

6.1 INTRODUCTION

Concurrent with Council Strategic Plan to restore the natural aesthetic qualities to the riverine corridor is the management of its river system. This section discusses the issues affecting the riverine corridors, and provides baseline information on biodiversity issues within the Study Area to inform future management plans. It presents an overview of existing biodiversity information on the Study Area and describes the results of the stream stability, vegetation assessment, and the river health assessment.

The extent of the environmental analysis includes:

- Drainage Patterns;
- Biodiversity and Environment;
- Water Quality and
- Past, current and future use of public open spaces.

The methods used throughout this assessment contain three main parts:

- The Literature Review
- The Stream Stability Assessment and
- Vegetation condition / River Health Assessment.

The stream stability assessment was conducted over 3 consecutive days on 18 - 20 November 2009 simultaneous with the vegetation condition assessment. The river health assessment took place late November 2009.

The analysis and follow up study of the current condition along the Study Area (as shown in Figure 6.1) revealed the issues and threats which face the river corridors. The informed understanding gained from the site study and analysis of the problem areas help to formulate a series of recommendations for the action plans that can be strategically implemented over a period to time to improve and restore the health of the river corridor.

6.2 LITERATURE REVIEW

Flora, fauna, habitat and related environmental values previously recorded within the assessment area were assessed via a literature and dataset review. The following websites, databases, reports and search results were used to complete this assessment:

- EPA South Australia website;
- Environment Protection and Biodiversity Conservation Act 1999 Protected Matters Search Tool;
- Native Vegetation (Floristic) - NVIS Statewide data;
- S.A Geological Atlas Series Sheet (1969);
- Natural Resource Management Plan for Adelaide and Mount Lofty Ranges Region (AMLRNRMB 2008);
- Action Plans for:
 - Gawler River Junction (Nardoo Studio 2002);
 - Clonlea Park (Caves et al. 2000, 2000a);
 - Dead Mans Pass (Caves et al. 1999);
- Information and data provided by Gawler Community Working Group and Gawler Frog Watch members, including Adrian Shackley, Alan Jamieson and Paul Koch; and

- Various biodiversity studies, including:
 - Determination of Environmental Water Requirements for the Gawler River System (Philpott et al. 1999);
 - Gawler East Development Amendment – Gawler East Ecological Survey (Kellogg Brown and Root Pty Ltd 2009 & 2010);
 - Assessment of Rivers in Gawler Council Area (Pastok et al. 1998);
 - Nutrient objectives for rivers and streams – ecosystem protection (EPA Victoria 2003a)
 - Australian River Assessment System (AUSRIVAS; Simpson et al. 1997)) and
 - River health in the Mount Lofty Ranges (EPA South Australia 2003).

The literature review also included additional information on the areas assessed along the Gawler and South Para river (Dead Mans Pass).

6.3 VEGETATION CONDITION ASSESSMENT

6.3.1 Assessment Methodology

Native vegetation condition, habitat quality and riparian condition for the North and South Para rivers within the study site was assessed using a modified version of the Rapid Appraisal of Riparian Condition ((RARC) Jansen et al. 2007), a technique designed to assess the ecological condition of riparian habitats in south-eastern Australia using indicators that reflect functional aspects of the physical, community and landscape features of the riparian zone. The riparian zone was defined as the channel, banks and the riparian canopy.

The Study Area was traversed on 18 – 20 November 2009 and riparian condition assessed using the RARC methodology.

The RARC methodology involves making a visual assessment of the riparian zone which can be expressed as an index or condition score with a maximum value of 50. The index is made up of five sub-indices, each with a number of indicators:

- Habitat continuity and extent (HABITAT);
- Vegetation cover and structural complexity (COVER);
- Dominance of natives versus exotics (NATIVES);
- Standing dead trees, hollows, fallen logs and leaf litter (DEBRIS) and
- Indicative features such as the extent of native canopy regeneration and native understorey regeneration the cover of native tussock grasses and reeds (FEATURES).

The study site was divided into 14 sub-reaches or sections. Sections were defined according to major physical or vegetation changes (e.g. low weed cover changes to high weed cover) and varied in length depending on their characteristics. Sections ranged in length from 100 to 1900 metres.

Within each section the riparian zone was scored for each of the sub-indicators using a field sheet. The final RARC index score was calculated as the sum of scores of the five sub-indices, with a possible maximum of 50 indicating best condition.



In the RARC methodology indicator scores are averaged across several transects within each section then summed into sub-indices. We used a modified version of this component of the methodology, scoring each sub-indicator only once for each section, rather than giving an average score over several transects within each section. This modification was justified given the relatively short length and uniformity of the vegetation within each section.

The final RARC condition index scores were categorized as follows:

- < 25 very poor;
- 25–30 poor;
- 30–35 average;
- 35–40 good; and
- 40 excellent.

Priority Vegetation Sites

During the RARC survey, vegetation management issues were identified for the riparian zone, Dead Mans Pass Reserve and Clonlea Park in consultation with the Community Working Group. Management issues were identified and mapped as priority sites at particular locations within the study site. Priority sites included locations of significant remnant vegetation and locations of invasions of high threat weeds. Priority sites were mapped (see Figure 6.2) and ranked according to the following criteria:

- High Priority – requiring action during first year of management;
- Medium Priority: requiring action within a 1 – 3 year time frame; and
- Low Priority: requiring action within a 3 – 6 year time frame.

The level of priority per issue was based on the results of the RARC survey for riparian sites, a general flora survey, search for significant flora species and desktop assessment of existing reports and databases.

The sites of highest priority were selected because one or more of the following aspects:

- High regional conservation significance of vegetation;
- Small size of remnant vegetation patch and vulnerability to disturbance and threatening processes;
- High biodiversity values – flora and fauna habitat; and
- High quality riparian vegetation.



LEGEND

Vegetation Condition Good

- Good
- Average
- Poor

Figure 6.1 Vegetation Condition

6.4 RIVER HEALTH ASSESSMENT

6.4.1 Site selection

Eight sites were examined along the North Para and the South Para. Six samples were taken within the Study Area. SP2 was taken just south of the Study Area on the Bates property, near Lundie Court. The location of both NP7 and EPA7526 were chosen to match those of existing EPA sites. NP7 was taken approximately 26km north east of Gawler Junction in Nuriootpa, and provides a regional view of the river health, while EPA7526 was taken approximately 200m south of the South Para. As NP7 was located outside the assessment area it has not been included in the figure. The coordinates of the sampling points are presented in Table 6.1 below, and all sites with the exception of NP7 have been colour coded in the Erosion Points and Sampling Points Plan (Figure 6.3) according to the River or EPA site it was obtained from (e.g. those sampled along the North Para have been coloured light blue).

Table 6.1. Geographic coordinates of River Health sampling locations.

Site ID/Code	River	Location	Latitude	Longitude
NP1	North Para	Clonlea reserve	-34° 35' 20.4''	138° 45' 04.6''
NP2	North Para	Clonlea reserve	-34° 35' 31.6''	138° 45' 03.1''
NP3	North Para	Main North Rd	-34° 35' 26.1''	138° 44' 43.4''
NP4	North Para	Nixon terrace behind the netball field	-34° 35' 43.5''	138° 44' 13.6''
NP7	North Para (EPA site)	North Para, bridge on Seppeltsfield Road, Nuriootpa	-34° 29' 01.7''	138° 58' 55.6''
SP2	South Para	Lundie Crt	-34° 36' 34.1''	138° 45' 28.0''
EPA 7526	South Para (EPA site)	Heinrich St, Gawler South	-34° 36' 47.7''	138° 45' 11.6''
SP3	South Para	Dead Mans Pass reserve	-34° 36' 33.0''	138° 45' 03.0''

6.4.2 Macroinvertebrate Monitoring

At each site one macroinvertebrate sample was taken along the edge of the River, and a habitat assessment was conducted. Given the time of year and the nature of the rivers, no riffle samples were taken. The sampling methodology confirmed to South Australian AUSRIVAS sampling and processing Manual (2002). Macroinvertebrate samples were taken with a sweep net (250 mm mesh) to capture those animals present within a 10m area of the edge present at a site. The sampled area was not necessarily contiguous, and attempted to encompass all the microhabitats available. The net was moved in sweeping actions through the water column as the sampler moved along the bank. Samples were preserved in 5% formalin and taken back to the laboratory where specimens were sorted, identified and counted using dissecting and compound microscopes.

6.4.3 Analyses

AUSRIVAS (AUStralian RIVers Assessment System) (Simpson et al. 1997) is a mathematical model which predicts which macroinvertebrate families should be present under a given set of reference conditions. This is done by comparing a test site with a group of reference sites which are as free as possible of environmental impacts but which have similar physical and chemical characteristics to those found at the test site (EPA 2003a). The O/E (observed/expected) scores derived from the model can then be compared to bands representing different levels of biological condition, as follows:

- A: Reference condition;
- B: Significantly impaired; and
- C: Severely impaired.

6.5 RESULTS

6.5.1 Geology and Geomorphology

The North Para and South Para flow through the Adelaide Geosyncline, an ancient and eroded block of sediments that were laid down in a marine trough (Philpott et al. 1999). The soil within the reserves associated with the Study Area, Clonlea and Dead Mans Pass, consist of light to medium clays. Further to the west along the Gawler River the deposits consist of grey fluviatile silts, sands and gravels of the modern drainage channels (S.A Geological Atlas Series Sheet SI 54-9 Zone 5 & 6).

The North Para, South Para and the Gawler River, are intermittent streams, i.e. they have a non-perennial flow regime. As in many South-Australian streams, during the dryer months, the river will stop flowing and only hold water in pools, which may dry out over summer, or dependent on location, local geology, and hydrology, these pools may hold water throughout the entire year. These pools are an important source of water for wild life and form an important refuge for different instream fauna.

6.5.2 National and State Biodiversity Data

EPBC Search Tool

The Environment Protection & Biodiversity Conservation (EPBC) Act 1999 lists matters of National Environmental Significance (NES). Matters of National Environmental Significance within the Study Area were analysed using the Commonwealth Environment Department’s EPBC Act Protected Matters Search Tool. This tool lists those species or species habitat and vegetation communities that may occur, or are likely to occur within the area. Matters of National Environmental Significance identified within the Study Area include:

- 5 threatened flora and fauna species
- 7 listed marine species;
- 9 migratory species;
- 63 sites on the Register of the National Estate;
- 1 threatened ecological communities – Peppermint Box Eucalyptus odorata Grassy Woodland of South Australia; and
- 3 threatened plant species – Silver Daisy-bush Olearia pannosa ssp. pannosa, Pale Leek-orchid Prasophyllum pallidum and Blue Top Sun-orchid Thelymitra cyanapicata.

The complete Search Tool results are presented in Appendix 2.

Table 6.2 Flora of South Australian and Southern Lofty Ranges regional conservation significance within the Gawler River system
Study Area (compiled source: Caves et al. 2000, 2000 & 1999; Shackley 2013).

Common name	Scientific name	State listing	Southern Lofty Ranges listing	Local Records		
				Clonlea	Dead Mans Pass	
Angled Lobelia	<i>Lobelia alata</i>		R		x	
Austral forget-me-not	<i>Myosotis australis</i>		R		x	
Australian Boxthorn	<i>Lycium australe</i>		E	x		
Australian Hollyhock	<i>Malva behriana [Lavatera plebeia]</i>		U		x	
Blanket Fern	<i>Pleurosorus rutifolius</i>		U		x	
Bristly Cloak-fern	<i>Cheilanthes distans</i>		R		x	
Broad Milfoil	<i>Myriophyllum amphibium</i>	R	R	x		
Brush Wire-grass	<i>Aristida behriana</i>		U	x	x	
Cotton Panic-grass	<i>Digitaria brownii</i>		K		x	
Creeping Brookweed	<i>Samolus repens</i>		R			
Creeping Monkey-flower	<i>Mimulus repens</i>		R	x	x	
Cut-leaf Goodenia	<i>Goodenia pinnatifida</i>		U	x	x	
Giant New Holland Daisy	<i>Vittadinia megacephala</i>		R		x	
Graceful Spear-grass	<i>Austrostipa acrociliata</i>		R	x		
Grassland Sida	<i>Sida corrugata</i> var. <i>angustifolia</i>		R	x	x	
Greater Calystegia	<i>Calystegia sepium</i>		U	x	x	
Grey Germander	<i>Teucrium racemosum</i>		T	x		
Hairy Panic	<i>Panicum effusum</i> var. <i>effusum</i>		K		x	
Heath Tea-tree	<i>Leptospermum myrsinoides</i>		R		x	
Knotty-butt Paspalidium	<i>Setaria constrictum</i>		R	x	x	
Leafy Wallaby-grass	<i>Austrodanthonia fulva</i>		U	x		
Lemon-grass	<i>Cymbopogon ambiguus</i>		V		x	
Lesser Joyweed	<i>Alternanthera denticulata</i>		U		x	
Mallee Box	<i>Eucalyptus porosa</i>		U	x	x	
Marsh Club-rush	<i>Bolboschoenus medianus</i>		R	x	x	
Mealy Saltbush	<i>Rhagodia parabolica</i>		V	x		
Narrow-leaf New Holland Daisy	<i>Vittadinia blackii</i>		R	x	x	
Native Apricot	<i>Pittosporum phylliraeoides</i> var. <i>microcarpa</i>		R	x	x	
Native Myrtle	<i>Myoporum montanum</i>		K	x	x	
Notable Wattle	<i>Acacia notabilis</i>		K	x		
Notched Sedge	<i>Carex bichenoviana</i>		U	x	x	
Pale Flax-lily	<i>Dianella longifolia</i> var. <i>grandis</i>	R	V	x	x	
Pale Twinleaf	<i>Zygophyllum glaucum</i>		T	x	x	
Prickly Spear-grass	<i>Austrostipa pilata</i>	V	T		x	

Pussy-tails	<i>Ptilotus spathulatus forma spathulatus</i>		R	x	x	
Rigid Panic	<i>Whalleya proluta</i>		R	x		
River Bottlebrush	<i>Callistemon sieberi</i>		U		x	
Rohrlach's Bluebush	<i>Maireana rohrlachii</i>	R	V	x	x	
Rough Raspwort	<i>Haloragis aspera</i>		R	x		
Rusty Spear-grass	<i>Austrostipa eremophila</i>		U	x	x	
Scented Mat-rush	<i>Lomandra effusa</i>		R	x	x	
Shore Club-rush	<i>Schoenoplectus litoralis</i>		U	x	x	
Short-crest Spear-grass	<i>Austrostipa curticoma</i>		U		x	
Silky Blue-grass	<i>Dichanthium sericeum</i> ssp. <i>sericeum</i>		V	x	x	
Silky Riceflower	<i>Pimelea micrantha</i>		R	x	x	
Silver Goodenia	<i>Goodenia willisiana [affinis]</i>		R	x	x	
Smooth solenogyne	<i>Solenogyne dominii</i>		U		x	
Spear-grass	<i>Austrostipa puberla</i>		K		x	
Spiky Club-rusf	<i>Schoenoplectus pungens</i>		U	x	x	
Streaked Arrowgrass	<i>Triglochin striatum</i>		R		x	
Swamp Twig-rush	<i>Baumea arthropphylla</i>	R	R		x	
Toothed Velleia	<i>Velleia arguta</i>		R		x	
Umbrella Bush	<i>Acacia ligulata</i>		K	x		
Warrego Summer-grass	<i>Setaria jubiflorum</i>		K		x	
Water-ribbons	<i>Triglochin procerum</i>		R		x	
Weeping Emubush	<i>Eremophila longifolia</i>		V	x	x	
Wingless Fissure-plant	<i>Maireana enchylaenoides</i>		U	x	x	
Woolly Cloak-fern	<i>Cheilanthes lasiophylla</i>		E		x	
Woolly Plover-daisy	<i>Leiocarpa tomentosa</i>		E		x	

CONSERVATION RATINGS USED

South Australia - National Parks and Wildlife Act Status

- EEndangered: rare and in danger of becoming extinct
- VVulnerable: rare and at risk from potential threats in the long term
- RRare: having a low overall frequency, confined to a restricted range or scattered sparsely over a wider area

SA Regional Conservation Status – Southern Lofty Area

- XPresumed extinct: not recorded for more than 50 years
- EEndangered: rare and in danger of becoming extinct
- VVulnerable: rare and at risk from potential threats in the long term
- TThreatened: rare and likely to become either endangered or vulnerable
- RRare: having a low overall frequency, confined to a restricted range or scattered sparsely over a wider area
- KUncertain: either threatened or rare but insufficient data for a more precise assessment
- UUncommon: less common species but not rare

Native Vegetation (Floristic) – NVIS Statewide

The NVIS dataset represents the State Governments key extant native floristic vegetation mapping layer for South Australia. It provides floristic and structural information, and/or presence of native vegetation in South Australia. The data set includes floristic vegetation mapping datasets produced as part of the Biological Survey of SA program, and is used to provide information on native floristic and structural vegetation mapping for South Australia.

Across the Study Area, there are currently four (4) different Vegetation Groups mapped under NVIS. These include:

- Vegetation Group MN2102
 - Eucalyptus forest and woodland containing River Red Gum Eucalyptus camaldulensis var., and Yellow Gum Eucalyptus leucoxylon ssp. in the mid open forest over African Boxthorn Lycium ferocissimum, Lignum Muehlenbeckia florulenta shrubs over a ground layer of Fennel Foeniculum vulgare, Rice Millet Piptatherum miliaceum and Cyperus gymnocaulos.
- Vegetation Group MN2001
 - Rushland/ Sedgeland Eucalyptus forest and woodland containing emergent River Red Gum trees over Sea Rush Juncus kraussii, Cyperus gymnocaulos, Phragmites australis and Narrow-leaved Cumbungi Typha domingensis over Creeping Brookweed Samolus repens.
- Vegetation Group MN2706
 - Callitris forest and woodland containing Callitris gracilis over Wild Oat Avena barbata, Feather Speargrass Austrostipa elegantissima, Flame Heath Astroloma conostephioides, Great Brome Bromus diandrus and tussock grasses Poa sp
- Vegetation Group SM1802
 - Eucalyptus forest and woodland containing Peppermint Box Eucalyptus odorata and Yellow Gum low woodland over Golden Wattle Acacia pycnantha, Kangaroo Thorn Acacia paradoxa, and Gold-dust Wattle Acacia acinacea mid shrubs over Small-flower Wallaby Grass Austrodanthonia setacea, Spear-grass Austrostipa scabra ssp. falcata, Wild Oat Avena spp, Feather Spear-grass Austrostipa elegantissima and low tussock grasses.

The mapped NVIS vegetation groups are presented in Appendix 3. The accuracy of this data has been questioned; although the known ranges of these associations overlap the Gawler area, there are no records of these species within the Study Area.

Regional and Local Biodiversity Data

Flora of Regional Conservation Significance

Kellogg Brown and Root (KBR) undertook an assessment of Gawler East in September 2008, located east of Dead Mans Pass along the South Para, and found there were no records of flora species of listed conservation significance for the site or adjacent areas on the Biological Database of South Australia and State Herbarium online database.

Following the biodiversity assessment undertaken by SMEC in 2009, KBR conducted further assessments in 2009 and 2010 (KBR 2009, 2010) for the Gawler East DPA. These assessments recorded iron grass (Lomandra multiflora and Lomandra effusa), in an area comprising approximately 1.8ha. As the ecological community Iron grass Natural Temperate Grassland is nationally listed as Critically Endangered, this triggers the requirements of the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act as a matter of National Environmental Significance (NES). Matters of NES require a detailed referral under the EPBC Act.

Several other species of conservation significance within the Southern Lofty Ranges region have been identified within the Study Area during the 2009 Assessment particularly along the North and South Para within Clonlea Reserve and Dead Mans Pass Reserve. These species are listed in Table 6.2.

In addition to these species, several recent vegetation assessments within and adjacent to the Study Area indicate that the dry, north and south-facing slopes of Dead Mans Pass and Clonlea Reserves are likely to have supported Mallee Box (Eucalyptus porosa) Woodland with an understorey of native grasses and shrubs (Caves et al. 2000, 2000a, 1999; KBR 2008). Mallee Box Woodland is listed as a threatened ecological community in the Mt Lofty Ranges Regional Recovery Plan (Wilson and Bignall 2009). There are also several areas of native grassland in and around Dead Mans Pass which may qualify as an endangered tussock grassland association; further assessment will be required to confirm this.

Fauna of Regional Conservation Significance

Although none have been detected by the current literature, three fauna species of conservation significance have been recorded in the Biological Database of South Australia: the Regent Honeyeater Xanthomyza phrygia, Painted button-quail Turnix varius and Black-chinned honeyeater Melithreptus gularis.

Other species of conservation significance either sighted in the area or potentially present include the Peregrine Falcon Falco peregrinus, Brush-tailed possum Trichosurus vulpecula, Bibron’s toadlet Pseudophryne bibroni, White winged chough Corcorax melanorhamphos, Diamond Fire-tail Stagonopleura guttata, Latham’s Snipe Gallinago hardwickii and the Flinders Rangers Worm-lizard Aprasia pseudopulchella (A. Shackley, pers. comm., 5 August 2011).

6.5.3 Previous Biodiversity Studies

Flora

Riparian Vegetation Condition

The three main rivers in the Gawler area (the Gawler River, North Para and South Para) are considered to be highly modified, with little existing remnant vegetation remaining along each of the Rivers (Pastok et al. 1998). While the native overstorey and understorey have largely been depleted, several reports demonstrate that a range of native species can still be found within the understorey, including Kangaroo Thorn Acacia paradoxa, Golden Wattle Acacia pycnantha, Windmill grass Chloris truncata, Common reed Phragmites australis and Wallaby grass Austrodanthonia sp. (Nardoo Studio 2002; Caves et al. 2000, 2000a, 1999; Philpott et al.1999; Pastok et al. 1998). A list of native species common to the Study Area is presented in Appendix 4.

In 1998, 213 sites were surveyed along 20 kilometres of the Gawler River, South Para and North Para and given an overall condition rating according to the state of riparian vegetation, rubbish and erosion. Overall, the condition of the river system was considered to be mostly fair, with more sites considered as having severe problems (11%) than being in best condition (1%) (Pastok et al. 1998). In particular, the Gawler River was found to contain the least number of ‘best’ or ‘good’ condition sites (0% and 2% respectively), with almost a quarter of the sites assessed up to the Gawler Bypass (i.e. the boundary of the Study Area) classified as having severe problems. Conversely, the North Para was the only river to contain any ‘best’ sites, which were associated with Clonlea Reserve, while the South Para contained the most ‘good’ sites (6%), which were associated with Dead Mans Pass Reserve (Pastok et al. 1998).

These trends were reflected in the native and exotic vegetation coverage, with the North Para containing the most coverage of high and moderate native vegetation (2% and 7% respectively). Overall the Gawler River had a the highest number of sites containing a moderate coverage of native vegetation (15%), however it also contained more areas with very high invasive species cover (4%) and other dominant exotics (26%). The South Para contained some areas of high and very high invasive species cover (5% and 0.5% respectively), while the North Para contained none. Overall, of the 213 sites surveyed during the assessment only 9 (4%) contained a high cover of native vegetation, with most sites dominated by other dominant exotic species (47%).

Although not focussed on riparian vegetation, the EPA undertook an assessment to define the environmental water requirements of the Gawler River System (Philpott et al. 1999). They divided the river system into seven (7) zones according to their morphology. Of these zones, three apply to the Study Area of the Biodiversity Assessment, identified as zones 1, 2 and 4. Zone 1 applies to the Gawler River, and was found to be dominated by River Red Gums Eucalyptus camaldulensis, over a severely modified understorey containing a high coverage of introduced species, such as olives, ash, castor oil plant, fennel and wild oats. However, some native understorey was still apparent within this zone. Zone 2 applies to the South Para, which, similar to the Gawler River, was found to be dominated by River Red Gums in the overstorey, with an understorey of mixed native and introduced species. However this zone was noted as containing native shrub species, such as Kangaroo thorn, Golden wattle Acacia pycnantha, and River bottle-brush Callistemon sieberi. Native groundcovers were also found to be present within this zone, including Spear-grass Austrostipa sp., Kangaroo grass Themeda triandra and Flat sedge Cyperus vaginatus. Zone 4 was associated with the North Para, and was found to be of varying condition, with a fairly continuous overstorey of River Red Gums, and an understorey modified to a range of mixed pasture grasses. Macrophytes were found to be more common in this zone, with Common reed, Bulrush Typha spp., Club-rush Schoenoplectus pungens and Spiny flat-sedge Cyperus gymnocaulos (Philpott et al. 1999).

Weeds

While the overstorey of much of the Study Area is still dominated by native River Red Gum, the original understorey has been highly modified and largely consists of a range of introduced shrubs, trees, grasses and herbs. This has been noted by previous studies (Nardoo Studio 2002; Caves et al. 2000, 2000a, 1999; Philpott et al. 1999; Pastok et al. 1998). Previous reports have documented a range of introduced species prevalent along each of the Rivers, including Peppercorn tree *Schinus areira*, olives *Olea europaea*, ash *Fraxinus* sp., castor oil plant *Ricinus communis*, fennel *Foeniculum vulgare* and wild oats *Avena fatua* (Philpott et al. 1999, Nardoo Studio 2002). An assessment of the Rivers within the Gawler Council area in 1998 found that out of 213 assessed sections of the River system, 65 (30%) were given a rating of ‘poor’ or ‘very poor’ due to their high coverage of annual and perennial exotic weeds (Pastok et al. 1998). A list of the weed species commonly found throughout the Study Area is presented in Appendix 5.

Fauna

Nationally listed fauna species

Two (2) nationally listed fauna species are currently listed as occurring within the Study Area, in addition to three (3) migratory bird species. These include Australian Painted Snipe *Rostratula australis*, Flinders Ranges Worm-lizard *Aprasia pseudopulchella*, White-bellied Sea-Eagle *Haliaeetus leucogaster*, White-throated Needletail *Hirundapus caudacutus* and Rainbow Bee-eater *Merops ornatus*. Of these species, KBR (2008) concluded that an area along the South Para south of Dead Mans Pass may contain suitable habitat for the Flinders Ranges worm-lizard. This species is nationally listed as vulnerable under the EPBC Act, but has no current formal listing at a State level. It has been observed within the northern suburbs of Adelaide, and is known to prefer open woodland, native tussock grassland, riparian habitats and rocky isolates. KBR found that this habitat was present on site and determined that the species is likely to occur, particularly around the rocky drainage line that stems off the South Para (KBR 2008).

Australian Painted Snipe typically inhabit a range of inland wetlands, preferring relatively dense grassland and sedgeland areas. While this habitat has been recorded within the Study Area in low densities, KBR (2008) concluded that within the Gawler East area the presence of foxes and feral cats would mitigate against their long term occurrence. This is likely to be the case for the remainder of the Study Area. However, it is likely that migratory bird species utilise the site or overfly it on occasion, with the Rainbow Bee-eater in particular noted as common avifauna within Dead Mans Pass Reserve (Caves et al. 1999).

Common fauna species

Studies have reported a large number of fauna present within the Gawler River system, however most of those encountered tend to be introduced species, such as European rabbit *Oryctolagus cuniculus*, European red fox *Vulpes vulpes*, Brown hare *Lepus capensis* and various introduced bird species, including Sparrow *Passer montanus*, Rock dove *Columbia livia*, and Starling *Sturnus vulgaris* (KBR 2008). Few native mammals, reptiles and amphibians have been recorded within the river system; however there have been some observations of Grey Kangaroo *Macropus giganteus*, Australian Water Rat *Hydromys chrysogaster*, Eastern snake necked turtle *Chelodina longicollis*, and native bats and possums (Pastok et al. 1998). The following presents and overview of the common fauna species documented from previous studies within the area.

Birds

A number of native bird species have been recorded along the rivers and their associated Reserves, including Rainbow Bee-eater *Merops ornatus*, Black-faced Cuckoo-shrike *Coracina novaehollandiae* and Red-rumped Parrot *Psephotus haematonotus* (Caves et al. 1999), with Kookaburra *Dacelo novaeguineae*, Eastern Rosella *Platycercus eximius*, Australian Magpie *Cracticus tibicen* and Noisy miner *Manorina melanoccephala* more common throughout the Study Area. Jamieson and White, members of the Gawler Community Working Group, have compiled a list of the bird species recorded throughout the study site, with records dating from 2002 to 2009. Most of the species recorded are common; however some rare and uncommon species have been recorded. The bird species list is presented in Appendix 6.

Aquatic species

Although ephemeral, native species of fish have been recorded within the Gawler River, North Para and South Para, including Short-finned eel or Congolli *Pseudaphritis urvilli*, Blue spot goby *Pseudogabius olorum*, Small mouthed hardyhead *Atherinosomo microstoma*, Mountain galaxias *Galaxias olidus*, Climbing galaxias *Galaxias brevipinnis*, and Common galaxias *Galaxias maculatus* (Philpott et al. 1999). Macroinvertebrate taxa have also been recorded, including water pennies *Sclerocyphon fuscus* and snail species *Thiara balonnensis*.

Several frog species have been recorded across the Gawler River system. In 2008 seven Gawler locals developed Gawler Frog Watch (GFW) in order to survey frog populations throughout the river system. Data was collected between September and October 2008, with a total of four species recorded during the survey, including Common Froglet *Crinia signifera*, Spotted Grass Frog *Limnodynastes tasmaniensis*, Banjo Frog *Limnodynastes dumerilii* and Brown Tree Frog *Litoria ewingii*. In addition to this data, Alan Jamieson of GFW has provided previous frog records from 1994 to 2005. A total of 233 frogs were recorded over the 11 years, with a total of 6 species documented, including Bibron’s Toadlet *Pseudophryne bibronii* (a State listed Rare species), Painted Frog *Neobatrachus pictus*, Common Froglet, Spotted Grass Frog, Banjo Frog and Brown Tree Frog. The data provided by Alan Jamieson has been compiled and is presented as Appendix 7. Overall, according to the data provided frog diversity and frog numbers appear to be highest within Dead Mans Pass, Clonlea Reserve, Gawler Junction and along the South Para on Fourteenth Street.

Pest Animal Species

Several pest animal species have been recorded within and adjacent to the Study Area, including European rabbit, European red fox, Brown hare and various introduced bird species. In particular, rabbits have been recorded within Clonlea Reserve, particularly along the dry north-facing slopes (Caves et al. 2000), impacting both native grass coverage and erosion of the slopes. Rabbits have also been recorded within Dead Mans Pass Reserve (Caves et al. 1999).

Pest bird species are known to occur throughout the eastern section of the Study Area, the most common of which include Common Starling, Rock dove, Sparrow and Indian dove *Streptopelia chinensis* (KBR 2008). Introduced fish species have also been found within the Gawler River System. In a survey undertaken in 1998, the South Australian EPA found four introduced fish species within the catchment, including European carp *Cyprinus carpio*, Goldfish *Carassus auratus*, Redfin perch *Perca fluviatilis* and Mosquito fish *Gambusia holbrooki*. Of these species, Mosquito fish were the most widespread; this is considered a concern given the highly competitive nature of the species (Philpott et al. 1999).

River Health

Fish and macroinvertebrate diversity

The Gawler River is an ephemeral river with significant variations in flow patterns, both seasonally and year to year (Philpott et al. 1999). Due to this, the in-stream habitat conditions can vary over time as different flows will influence sediment sorting and movement, directly impacting riparian vegetation. Few studies have assessed the health of the three rivers, in particular with reference to fish and macroinvertebrate diversity. The SA EPA undertook such a study in 1998, of which 2 of the 14 sampling sites fall within the Study Area. Most of the native fish that were expected to be found within the river system were present but often with a limited distribution (Hicks and Sheldon 1999), with Congolli and Common Galaxias found at the Gawler River Junction (Philpott et al. 1999).

Over 230 types of macroinvertebrates were sampled across the river system as part of the assessment. Of these, several species were considered to be significant in regards to biodiversity of conservation issues in the catchment, including snail, water pennies, water mite *Austrotrombella* sp. and Caddisfly larvae *Orphnino-trichia* sp. Of these indicator species, snails were present within the North Para, and water pennies in the South Para. Overall, the entire Gawler River system was given a moderate rating in terms of its ecological health, with the ability to support a moderate level of macroinvertebrate taxonomic diversity (Philpott et al. 1999). Furthermore, of the two sites located within the relevant Study Area, the Gawler River Junction recorded an excellent score for its Index of Biotic Integrity (IBI) based on the fish species captured at the site.

6.6 BIODIVERSITY ASSESSMENT

6.6.1 Stream Stability & Vegetation Condition Assessment

Stream stability

Table 6.5 presents the results of the Stream Stability Assessment. The survey identified 26 erosion issues of which most were of low priority and were relatively stable. Stability at those low priority sites would need monitoring by council so if any further erosion does occur at this sites, this can be dealt with in an early stage. We identified 3 high and 11 medium priority sites which would need some intervention works. These works include some engineering work as well as revegetation.

Vegetation Condition

SMEC undertook a survey of the riparian vegetation of the North and South Para Rivers in November, 2009. Much of the riparian vegetation was found to be in Average Condition, with only two distinct areas of Good Condition; one associated with Clonlea Reserve, the other with Dead Mans Pass.

The complete results of the vegetation condition assessment are presented in Vegetation Conditions Plan (Figure 6.1). The results of the vegetation condition assessment were used to determine a number of priority sites for the Study Area, which are presented in Table 6.4 below.

6.6.2 River Health Assessment

The spring 2005 AUSRIVAS assessment of aquatic health in the Gawler River and Little Para catchments showed that aquatic health varied between ‘significantly impaired’ and ‘reference’ condition. ‘Reference’ (good) condition refers to the level of aquatic health that may be expected for the site under natural conditions. More commonly, health assessments in 2005 rated surveyed watercourses as being in good or ‘reference’ condition. In general, however, these sites were located downstream of the South Para Reservoir and so may reflect the relatively undisturbed landscape of the surrounding Para Wirra Recreation Park (AMLR NRMB 2008). This is in accordance with the results of the river health assessment in the Adelaide and Mount Lofty Ranges (2003). These results indicate that the majority of sites along the South and North Para are in good condition. The areas that that score ‘good’ were generally characterized by minimal human disturbance and high rainfall (EPA SA 2003).

Macroinvertebrates

Thirty nine (39) macroinvertebrate families were collected during the river health assessment. The AUSRIVAS score for the edge macroinvertebrate communities collected at each site are presented in Table 6.4.

Table 6.4 Macroinvertebrate indices along the North Para and South Para, Gawler SA November 2009.

Site	OE50 (Observed Expected)	Band
SP2	0.51	B
NP7	0.86	A
NP2	0.67	B
NP1	0.61	B
NP3	0.84	A
NP4	0.53	B
SP3	1.02	A
7526	0.35	C

Table 6.4 shows the AUSRIVAS indices for each of the different sites. The OE50 (i.e. observed/expected) statistic indicates the similarity of the macroinvertebrate assemblages to those at the reference sites, with 1 indicating high similarity and 0 low similarities. The band scores refer to the river health condition relative to the reference sites (refer to Methodology for definitions).

Site NP7 (Bridge on Seppeltsfield Road, Nuriootpa), NP3 (Main North Rd) and SP3 (Dead Mans Pass reserve) all contain a macroinvertebrate community in ‘good’ condition (i.e., similar to the reference site) as indicated by the AUSRIVAS band A. This is in accordance with the results of previous river health assessments conducted by the EPA in the same region (EPA SA, 2003). Site SP2, NP2, NP1, NP4 had an AUSRIVAS band of B which indicates the river health is ‘significantly impaired’ at those sites. Site EPA7526 (Heinrich St, Gawler South) was ‘severely impaired’. The low score in on this site is likely to be due to the fact that the site was drying out at the time of the assessment, therefore the majority of the macroinvertebrates found in the sample were snails.

6.7 STREAM STABILITY ASSESSMENT

Australian Water Environments conducted a survey which identified bank stability and erosion issues along the North Para and South Para river corridors, and developed remediation strategies for the top six priority areas (AWE 2009). This Stream Stability Assessment was based on the AWE survey and produced a priority list with stream stability issues. Rather than repeating the work AWE already done, we provided a priority list of stream stability issues which is complementary of that to the AWE report. Based on AWE’s previous report and SMEC assessment, recommendations for remedial works will be incorporated as part of this Master Plan.

When locating the erosion points the follow parameters were taken into account:

- Evidence of slumping, presence of exposed tree roots, bank slope;
- Signs of bank erosion (gullyng, storm water output erosion);
- Bank stability (presence of vegetation);
- Presence of infrastructure;
- Habitat complexity (i.e. presence of vegetation, presence of woody debris); and
- Representative photographs.

A priority rating was given to the different stream stability issues based on the degree of instability and the risk the issues imposed on public safety and to presence of private and public assets. In cooperation with a geotechnical engineer, recommendations were given on which sites needed remedial works.

The sites listed in Table 6.5 were identified as requiring stabilisation works. High priority works were undertaken in the first stage of the initial Gawler Urban Rivers Project, as shown in the table below.

6.8 RECOMMENDATIONS TO IMPROVE BIODIVERSITY VALUES

6.8.1 Introduction

In this section we provide a framework for environmental management works within the Study Area; these are codified and tabulated in Sections 8 and 9. From an ecological point of view the goal of remedial work is to provide a biodiversity corridor between areas of high biodiversity areas. These recommendations aim to work towards this aim. Note that this section makes general suggestions on different management actions. For specific recommendations on the different reserves refer to the Action Plans incorporated in this Master plan.

In general, the Study Area can be divided into three broad habitat categories based on vegetation type and level of disturbance, as described in Table 6.6.

Table 6.6 Habitat Categories within the Gawler Rivers Study Area

Category		Location
1	Remnant Mallee Box woodlands and grasslands	On the upper slopes and cliffs of Dead Mans Pass Reserve and Clonlea Park
2	Permanent deep pools	Within Dead Mans Pass Reserve and Clonlea Park supporting moderate to good quality riparian vegetation
3	Riparian zones	North Para and South Para within the urban environs of Gawler which support degraded riparian vegetation.

Table 6.5 Stream Stability issues identified along the Gawler River, North Para and South Para, Gawler SA in November 2009

Site & Photo Reference	River	Description	Priority	Recommendations
A	Whitelaw Creek	Clonlea Park, confluence Whitelaw creek and North Para. Bank erosion on the south bank.	Low	Monitor
B	North Para	Clonlea park. Erosion under existing path (top of bank). If erosion progresses there may be a danger of losing the existing path.	Medium	Engineering solutions required to protect the existing path engineering solutions
C	North Para	Clonlea park, Bank slump on north bank likely caused by water seepage trough bank, which causes soil to saturate and slump.	Medium	Plant vegetation on top of slump, or redirecting surface water away of top of bank
D	North Para	Clonlea park, vertical bank collapsed and then sediment deposit erodes away.	Low	Monitor
E	North Para	Clonlea park, bank erosion under bridge abutment is likely to threaten asset	High	Bank erosion is undermining the bridge abutment, which could in the long run threaten the bridge. Both banks are eroding, but the right bank is more affected than the left bank. Engineering solutions are required to protect the bridge.
F	North Para	south bank –Gully erosion, near some larger eucalypt trees Current erosion control with straw bales	Medium	Planting vegetation above slump, or replace straw bales with rock work
G	North Para	Behind caravan park undercut bank and slumping bank	High	Monitor, and if erosion is increasing, engineering solutions are required.
H	North Para	Slumped area near top of left bank. Hole in the bank causes gully erosion from top of bank to stream bed.	High	An existing hole is likely to been eroded out, holding water which caused gully erosion to the stream bed. To prevent further erosion engineering solutions are required as well as revegetation of the bank.
I	North Para	Undercut banks	Medium	Undercut bank may impact on the tree above. Should be monitored. If erosion progresses, engineering solutions are required (i.e installing rock beaching to protect tree).
J	South Para	Gabions on south bank linked to drainage line and storm water outlet. Sediment up build below the gabions	Low	Monitor
K	South Para	Undercut banks	Low	Monitor, if erosion is continuing engineering solutions are required
L	South Para	Undercut banks	Low	Monitor, if erosion is continuing engineering solutions are required
M	South Para	Undercut banks	Low	Monitor
N	South Para	Bank erosion	Low	Monitor
O	South Para	Undercut bank	Low	Monitor, if erosion is continuing engineering solutions are required
P	South Para	Stormwater outlet erosion	Medium	Engineering solutions required
Q	South Para	Bank erosion	Low	Monitor, revegetation if erosion is increasing
R	South Para	Stormwater outlet erosion	Low	Monitor
S	South Para	undercut bank	Low	Monitor

T	South Para	Storm water outlet erosion	Medium	To prevent losing an asset, engineering solution required
U	South Para	Gullying	Medium	Engineering solution required to redirect the surface water run off to a controlled entry point
V	Gawler	Undercut bank	Low	Monitor
W	Gawler	Bank slumping	Medium	Monitor
X	Gawler	Undercut bank	Low	Engineering solution required to decrease the water velocity of low flows,
Y	Gawler	Undercut bank	Low	Monitor
Z	Gawler	bank slump	Medium	Engineering solution required to stabilise bank
AA	Gawler	Undercut bank	Medium	Engineering solution required to stabilise bank
AB	Gawler	Undercut Bank	Medium	Engineering solution required to stabilise bank

Within the Study Area, a number of sites have been identified as priorities for management (‘priority sites’ listed in Table 6.9) however, management requirements are broadly similar within each habitat category. Rather than discussing each priority site separately, broad management recommendations are provided for each of the three habitat categories. The following section presents management recommendations for Dead Mans Pass Reserve and Clonlea Park and the urban sections of the North Para and South Para (between the two reserves).

6.8.2 Remnant Mallee Box woodlands and grasslands

The remnant areas of Mallee Box woodlands and grasslands at Dead Mans Pass and Clonlea Park include the north and south facing slopes of the two reserves and are characterised by a high diversity of native grasses, herbs and shrubs. This vegetation type would have consisted of a very open canopy of Mallee Box over a grassy understorey (Seaman et al. undated). This is also likely to have been interspersed with open grassland. The majority of the remnants within the Study Area are now predominantly open grassland with small areas of scattered Mallee Box. Vegetation condition in the Gawler region varies depending onsite accessibility and proximity to housing and walking tracks.

The major threats to the Mallee Box woodland remnants are:

- Invasion of woody herbaceous and grassy weeds;
- Rabbit infestation resulting in loss of vegetation and erosion, and
- Disturbance due to formal and informal walking tracks and pedestrian traffic.

Recommendations

- Establish conservation zones around these areas
- Rabbit control
- Continue weed management: olive removal, grassy weeds, control non indigenous plantings,
- Re-establish indigenous over storey and under storey
- Mark and fence patches of significant vegetation
- Investigate controlled ecological burning for management native grass land zones.

Table 6.7 is a summary of the issues and major threats to each of these categorised areas and its recommendation for action.

Table 6.7 Summary of site issues and recommendations for remedial works.

Area	Category	Issues / threats	Recommendation
Clonlea Park and DeadMans Pass	1	<div><div>— invasion of woody herbaceous and grassy weeds;</div><div>— rabbit infestation resulting in loss of vegetation and erosion, and</div><div>— disturbance due to formal and informal walking tracks and pedestrian traffic.</div></div>	<div><div>— Establish conservation zones around these areas</div><div>— Rabbit control</div><div>— Continue weed management : olive removal, grassy weeds, control non indigenous plantings,</div><div>— re-establish indigenous over storey and under storey</div><div>— Mark and fence patches of significant vegetation</div><div>— Investigate control ecological burning for management native grass land zones</div></div>
Clonlea Park and DeadMans Pass	2		<div><div>— Restoration of pools (for example sampling site SP3)</div><div>— Create conservation areas around the pools</div><div>— Minimise disturbance around these areas (take this into account when installing extra paths and foot bridges).</div></div>
Clonlea	3		<div><div>— Weed control - staged weed control program in combination with revegetation to protect stream banks as weeds are removed;</div><div>— Revegetation of priority sites including pools and erosion points.</div></div>

6.8.3 Deep Pools

Clonlea Park has at least 4 permanent pools, of which two have been sampled during the river health assessment (NP1 and NP2). Dead Mans Pass Reserve has one substantial pool, which was sampled during the river health assessment (refer to Table 6.8 for location).

To improve river health in these sections of the creek actions are required both on a catchment scale as well as a local scale. Catchment scale actions could include control of storm water run-off and reduction of erosion and sedimentation input upstream. However, this section of the Master Plan has focussed on the local scale and provides recommendations for more localised actions.

Table 6.8. Locations permanent pools in Clonlea Park and Dead Mans Pass Reserve. Locations with * have been sampled for the river health assessment

Pool ID	Latitude	Longitude
NP A	-34 35' 12.40''	138°,45 09.53''
NP B	-34 35' 17.87''	138°, 44 57.88''
NP1 *	-34 35' 20.4''	138° 45' 04.6''
NP2 *	-34° 35' 31.6''	138° 45' 03.1''
SP3*	-34° 36' 33.0''	138° 45' 03.0''

NP A – located on the north side of Clonlea Park and has a good riparian zone condition with low weed cover and presence of regionally significant flora and fauna (see priority Site 15 in Table 6.9).

Recommendation: minimise disturbance and create a conservation area around this pool.

NP B – located on the Westside of the park below a high cliff, the riparian zone condition scores good (see Site 13 in Table 6.9). This site is vulnerable to disturbance due to its proximity to recreation areas and its use as a recreation site.

Recommendations:

- Control and limit access via pathways and boardwalks; increase riparian buffer with understorey planting
- Control feral pigeons which are polluting the waterhole because of roosting on the banks in large numbers

NP1 – located upstream of the Whitelaw creek confluence and although the vegetation assessment indicates that the riparian zone condition is good, the Clonlea Park Action Plan mentions presence of woody weeds such as Ash Fraxinus sp. and Boxthorn Lycium sp. as well as ground layer weeds. Furthermore there are some important native species that are under threat because of recreational pressure. The recommendations below would improve the riparian zone and river health.

Recommendations:

- Undertake weed control
- Increase riparian buffer with understorey planting
- Minimize recreational pressure by installing raised boardwalks or viewing platforms.

NP2 – located upstream of Murray Road and has a medium riparian zone condition with good canopy cover and moderate diversity of indigenous species in the wet zone.

Recommendation: this deep pool could be restored by revegetation of riparian zone.

SP3 – Dead Mans Pass Reserve has a larger permanent pool, SP3, which is located near Nott Street, near one of the former horse jumps. This section extends further upstream but is largely overgrown with native reeds. The pool used to be more open, and was approximately 70m long by 10m wide, but has partly filled up with sediment due to upstream erosion and deposition (A. Shackley, pers. comm., 28 January 2011). The riparian zone condition is good and results of the river health assessment shows this pool has a good river health. As part of the Gawler Urban Rivers Project, Gawler Council and community conservation advocates have obtained approvals to restore this waterhole.

Recommendations:

- Continue restoration of waterhole as proposed by careful removal of silt build-up and revegetation.
- Develop a management plan to ensure ecological and hydrological requirements are maintained and further sediment deposition minimised.

6.8.4 Urban Riparian Zones

In the urban stream sections it is important to concentrate on the sites with the biggest erosion issues (see stream stability assessment), on sites with the highest vegetation quality (see priority vegetation sites), and sites with high biodiversity values.

To restore and improve the priority sites, the following actions are recommended:

- Weed control - staged weed control program in combination with revegetation to protect stream banks as weeds are removed;
- Revegetation of priority sites including pools and erosion points.

6.8.5 Recommendations on Monitoring River Health

Three sites had a similar condition as the reference site, four sites had a condition below the reference condition and one well below the reference site condition. The 2005 AUSRIVAS assessment also found that the river health varied between ‘significantly impaired’ and ‘reference’ condition. These findings are in concordance with previous assessments (EPA, 2003).

It should be noted that the findings of this assessment are a ‘snapshot’ of the current status of the river sections assessed. These findings do not indicate any particular trend to suggest the system is stable, degrading or improving in terms of biodiversity. Given that the current data set provides baseline data for future monitoring, the repeated sampling of the current locations (spring and autumn each year) would assist in determining any progress made by the implementations of the Urban River Master Plan.

Table 6.9 Vegetation priority sites identified along the Gawler River, North Para and South Para based on results of the RARC assessment (November 2009).

Site	River	Description	Priority	Management Issues
1	South Para	Dead Mans Pass South facing slope. High diversity remnant grassland. Remnant of Mallee Box open grassy woodland.	High	<ul style="list-style-type: none">— Invaded by Olives. Olive removal program on-going.— Highly invasive grassy and herbaceous weeds including Wild Oat, Phalaris and Salvation Jane are major threats to grassland.— Kikuyu is a major threat in the drainage line.— On-going management required to control weed invasions.— Two State significant species recorded in this location (<i>Dianella longifolia</i> var. <i>grandis</i> and <i>Carex bichenoviana</i>).— Other regionally significant species recorded at site.— This is a potential high quality grassland site. Shared path route runs through the site. Modification of route may be required to avoid further impacts and promote rehabilitation of this site.— Action Plan for Dead Mans Pass recommends re-establishment of Mallee Box canopy at low density to reflect the pre-European open grassy woodland.
2	South Para	Dead Mans Pass. Top of slope adjoining housing estate. Modified grassland invaded by grassy and herbaceous weeds. Cultivated ridge adjoining housing estate. Remnant of Mallee Box open grassy woodland.	Medium	<ul style="list-style-type: none">— This section of the south-facing grassy slope is more degraded than further down-slope.— Grassy weeds, especially Wild Oat are dominant in this section.— Potential to re-route shared path through this more modified section of grassland to avoid higher quality area down-slope.
3	South Para	Dead Mans Pass. Mallee Box <i>Eucalyptus porosa</i> woodland with diverse grassy understorey.	High	<ul style="list-style-type: none">— South facing slope with diversity of grasses and herbs in the understorey.— Tussock Grass <i>Poa</i> spp. only occurs on this moist south facing slope within the reserve.— Mallee Box overstorey is present in this section but declining.— This slope is subject to a range of disturbances impacting on the native vegetation.— Walking track may require re-alignment to avoid patches of native grasses.— Major issues include woody weed infestation (Olives) and loss/decline of Mallee Box overstorey.
4	South Para	Dead Mans Pass. North facing slope. High diversity grassland and significant species location.	High	Location of State significant Rohrlach’s Bluebush <i>Maireana rohrlachii</i> also listed in The Rare or Threatened Australian Plants (ROTAP) list developed by the CSIRO.
5	South Para	Dead Mans Pass. North facing rocky cliffs and slopes.	High	<ul style="list-style-type: none">— Identified as a key conservation zone within Dead Mans Pass Reserve.— High diversity of indigenous grasses (20 species), herbs and ferns with a total of over 50 native species present including 19 Regionally and 1 State/Nationally significant species. As an area of about 1 hectare of native tussock grassland this area would likely be rated by DENR as a critically endangered plant community for the region. All efforts should be made to protect it and provide adjacent areas to allow the area to expand.— Low to moderate cover of grassy weeds. Weed and grassland management required.— Planted non-indigenous natives at top of ridge have potential to become invasive.— Planted non-indigenous trees are shading out native grasses in the understorey.— Potential to thin out planting to allow native species to spread. Some clearance is proposed as part of the Urban Rivers Project. Note the planting also serves as a buffer to the adjoining housing estate.
6	South Para	Dead Mans Pass. Mallee Box Woodland with grassy understorey. Good canopy cover of Mallee box with diverse grassy understorey.	Medium	<ul style="list-style-type: none">— Remnant Mallee Box.— Potential to regenerate this site by promoting regeneration of Mallee Box implementing grassy and woody weed control.— Site adjoins residential street at top of slope. Potential to fence off part of this zone to restrict access during rehabilitation.— Shared path and walking track avoids this site.
7	South Para	Section of river from Main North Road (at end of Dead Mans Pass Reserve) to existing footbridge at Fourteenth Street. Riparian condition changes markedly at the boundary of the reserve. Highly degraded section of river with very poor riparian condition.	Low	<ul style="list-style-type: none">— Site adjoins higher quality riparian vegetation at Dead Mans Pass.— Site is a priority site due to high cover of high threat weeds.— The canopy is healthy however, very few hollow-bearing trees are present and regeneration of River Red Gum is poor.

8	South Para	Site of invasion of the high threat weed Giant Reed.	Medium	Giant Reed is a high threat weed in the North Para and South Para. The south bank has a dense infestation of Giant Reed for approximately 100m.
9	South Para	From footbridge at Fourteenth Street to Gawler Junction. Highly degraded section of river with very poor riparian condition	Low	<ul style="list-style-type: none"> — Site includes river junction which has high cultural significance and high priority as a revegetation site. — Highest numbers of hollow-bearing large old trees within Study Area. Important habitat for hollow-dependent fauna. — However, canopy cover is lower in this section of the river (20-50%) than upstream. — Site is otherwise highly degraded with infestations of high threat weeds and poor regeneration of River Red Gums.
10	North Para	From Gawler Junction to the footbridge at the Caravan Park Highly degraded section of river with very poor riparian condition	Low	<ul style="list-style-type: none"> — Site includes river junction which has high cultural significance and high priority as a revegetation site. — Highest numbers of hollow-bearing large old trees within Study Area. Important habitat for hollow-dependent fauna. — However, canopy cover is lower in this section of the river (20-50%) than upstream. — Site is otherwise highly degraded with infestations of high threat weeds and poor regeneration of River Red Gums.
11	North Para	Murray Street to middle of Caravan Park.	High	<ul style="list-style-type: none"> — Two deep pools occur within in this site. — Close to Murray Street the riparian vegetation is of higher quality with a diversity of sedges and rushes present. — The site becomes more degraded further downstream adjacent to the caravan park. — This section has potential as a priority revegetation and rehabilitation site as it adjoins Clonlea park and the deep pools provide the basis for improvement of biodiversity values in this section of the North Para River to link with high quality riparian vegetation upstream.
12	North Para	Riparian vegetation in Clonlea Park from Murray Street upstream to the ford.	Medium	<p>Riparian vegetation in moderate condition with good canopy cover and moderate diversity of indigenous species in the wet zone.</p> <p>Site has potential for restoration of bank vegetation and improvement of riparian habitat.</p>
13	North Para	Permanent deep pool and steep cliffs.	High	<p>Site occurs within highest quality section of the North Para River, characterized by deep pools, rocky slopes and cliffs and intact native understorey.</p> <p>This site is vulnerable to disturbance due to its proximity to recreation areas and its use as a recreation site.</p> <p>Clonlea Park Action Plan notes potential impact on regionally significant wetland plant communities.</p>
14	North Para	Non-indigenous native planting.	Low	<ul style="list-style-type: none"> — Non-indigenous plantings established for approximately 25 years. Indigenous understorey remains with a moderate cover of indigenous grasses and grassland species. — Likely to have supported Mallee Box open woodland and native tussock grassland (as seen in areas where trees are absent). — This zone provides visual and physical buffer to the river and recreational opportunities. — Clonlea Reserve Action Plan recommends retention of this planting to provide amenity and recreational opportunities away from the intact riparian and grassland conservation zones. — Potential exists in the long term to thin some of the plantings to promote regeneration of native understorey species and replace with a sparse Mallee Box canopy.
15	North Para	Deep permanent pool below rock escarpment. Riparian zone condition is very good with low weed cover and presence of regionally significant flora and fauna.	High	<ul style="list-style-type: none"> — Management requirements are minimal with major priority to designate site as a conservation zone. — A footbridge is proposed for this site. However, construction at this site is not recommended as the site supports intact riparian vegetation and disturbance should be avoided.
16	North Para	Dry North – facing slopes adjoining rail line. Site lies between rail line and Whitelaw Creek.	High	<ul style="list-style-type: none"> — Remnant Mallee Box open woodland understorey supporting a diversity of grasses and shrubs but no canopy. — Patches of relatively high quality grassland and shrubland occur within this site. — Woody and non-woody weed invasion occurring. On the top of the slope non-indigenous tree plantings out-compete weeds and have allowed a higher diversity of understorey species. The Whitelaw Creek and rail corridor bush care site adjacent this area has some 60 native plant species. This is a very high priority area for conservation and as a potential seed source for some species.
17	North Para	Dry North-east facing slopes above the west bank of the North Para River.	High	<ul style="list-style-type: none"> — High diversity remnant grassy understorey of former Mallee Box open woodland. — This site can be protected and maintained as a conservation zone.



LEGEND



-  Priority site
-  Treatment recommended

Figure 6.2 Vegetation Priority Treatment Areas



Figure 6.3 Erosion Points and Sampling Points

LEGEND

Erosion Points identified by AWE



Erosion points identified by DSE SMEC



High



Medium



Low



Sampling point (North Para)



Sampling point (South Para)



Sampling point (EPA)

Section 07 - Stormwater Infrastructure Analysis

The background of the slide is a solid light blue. In the lower-left quadrant, there are two thin, white, curved lines that sweep upwards and to the right, creating a sense of motion or a stylized 'S' shape. The lines are smooth and continuous, with one line positioned slightly above and to the left of the other.

07 Stormwater Infrastructure Analysis

7.1 INTRODUCTION

This stormwater catchment analysis has been prepared to provide an overarching assessment of the stormwater infrastructure that feed directly into the Gawler Urban Rivers. The purpose of this analysis is to provide a baseline of data that can inform the management of Gawler's stormwater infrastructure and the potential impacts of stormwater on the Gawler Urban Rivers.

A site inspection was undertaken to identify all stormwater inputs into the rivers. The site inspection data and information from Council's GIS system has been used to characterise the catchments feeding into these outlets by their area, type of stormwater infrastructure, slope of catchment and land use.

The Study Area comprises three main rivers: North Para; South Para; and the Gawler River. The North Para and South Para flow in a southwest and northwest direction respectively, joining at Gawler to form the Gawler River, which continues downstream in a southwesterly direction to Gulf St Vincent.

The North Para catchment extends to the north and east Council boundaries and includes part of the central Gawler area divided by a ridge extending in a general east west direction (further catchment exists to the east; however, this has not been included as it falls outside the Study Area). The South Para collects the area to the south of this ridge and extends to a further ridge that bends from the east around to the northwest. Beyond this ridge is collected by the Gawler River, with part within and part outside the Study Area.

The Gawler Council Development Plan describes the land use within the Study Area is predominantly Residential, with a pocket of Industrial lying to the north, Special Uses zone lying central to the confluence, with Historic Residential and the Gawler central business district (zoned Historic Town Centre) further to the east, and a Rural Living zone lying to the northwest, adjacent to the council boundary (see Figure 3.1).

These main catchments within the Study Area comprise of smaller sub catchments with outlets to the rivers and are discussed below. The extent and nature of the catchments, and the locations of the outlets that input stormwater into the rivers, are shown in the attached Figures 7.1 – 7.5.

7.2 NORTH PARA OUTLETS

Outlet 1: Hannon Crescent

This outlet is a feeder stream with a total upstream catchment of 177.10 Ha and land uses of Residential (99%) and Residential Historic (1%). It consists of a number of outlets along its length with corresponding catchments and sub-catchments discussed below. Treatment infrastructure is also provided to some of these outlets and is discussed below.

Outlet 1A: Lyndoch Road/ Philips Avenue intersection

The catchment is 6.42 Ha, bounded by the Council Boundary to the east, Phillips Avenue to the west and Matz Court to the south. Land use is entirely Residential. The catchment slope is 3.6% and it drains to a 300mm pipe. There is no treatment infrastructure in this catchment.

Outlet 1B-2: South of Lyndoch Road/ HemaFord Grove intersection

The catchment is 91.26 Ha and includes two sub catchments 1B-1 and 1B-2. Sub catchment 1B-2 extends south of Lyndoch Road, east to Philips Avenue and west to Powell Avenue. Land use for the total catchment is Residential. The total catchment has an average slope of 2.4% and drains to the feeder stream via a 900mm diameter pipe. Treatment is provided by a trash rack with bags and is located along Lyndoch Road.

Outlet 1B-1: Lyndoch Road/ Hemafor Grove intersection

Upstream of Lyndoch Road, the sub-catchment is 88.07 Ha, bounded by the Council Boundary to the east, Phillips Avenue to the west and Matz Court to the south. Land use is entirely Residential. The catchment slope is 2.4% and drains to sub catchment 1B-2 via a pipe of unknown size. Treatment is provided as mentioned for Outlet 1B-2 above.

Outlet 1C: Powell Drive

The catchment is 5.15 Ha and collects the Powell Drive Estate zoned Residential. The catchment slope is 4.8% and drains to a 300mm pipe. There is no treatment infrastructure in the catchment.

Outlet 1D: Midway between Powell Drive and Cheek Avenue

The catchment is 4.43 Ha and extends south to a ridge line shy of Lyndoch Road as well as west and east to Cheek Avenue and Powell Drive respectively. Land use is zoned Residential. The catchment slope is 6.6% and drains to a natural channel. There is no treatment infrastructure in the catchment.

Outlet 1E: End of Cheek Avenue

The catchment is 9.26 Ha and extends south and east along Cheek Avenue to the ridge lines and to a further ridgeline to the west along Bassett Crescent. Land use is zoned Residential. The catchment slope is 3.8% and drains to a 525mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 1F: Bartel Court

The catchment is 5.31 Ha and extends south and east to the ridge line along Bassett Crescent and east to Bartel Court. Land use is zoned Residential. The catchment slope is 3.0% and drains to a 375mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 1G-3: End of Bella Street- east side

The catchment is 52.59 Ha and includes three sub catchments 1G-1, 1G-2 and 1G-3. Sub catchment 1G-3 extends south of Berrett Road and along Bella Street. Land use for the total catchment is mostly Residential (97%) with remainder Residential Historic (3%). The total catchment has an average slope of 2.4% and drains to the feeder stream via a channel. Treatment is provided upstream of the outlet for 1G-2 by a gross pollutant trap and trash rack and is located to the south of Lyndoch Road.

Outlet 1G-2: Berrett Road

Upstream of Berrett Road, the two sub catchments 1G-2 & 1G-1 total area is 50.52Ha. Sub catchment 1G-2 extends to the south of Lyndoch Road, east to the ridgeline along Berrett Road and west to Bella Street. The combined land use is the same as for Outlet 1G-3 section above. The catchment slope is 2.3% and drains to catchment 1G-3 via a 750mm pipe. Treatment is provided as mentioned in Outlet 1G-3 section above.

Outlet 1G-1: Lyndoch Road/ Ellis Street intersection

Upstream of Lyndoch Road, the sub-catchment is 35 Ha and extends south to end of Cheek Avenue, east to ridgeline along Peacock Avenue and west to Lyndoch Road/ Crown Street intersection. Land use comprises 96% Residential and 4% Residential Historic. The catchment slope is 2.2% and drains to an 825mm pipe into catchment 1B-2. There is no treatment infrastructure in this sub-catchment.

Outlet 1H: End of Bella Street- west side

The catchment is 2.65 Ha and extends south along Bella Street to Berrett Street intersection and west to end of Bellevue Court. Land use is entirely Residential. The catchment slope is 4.4% and drains to a 525mm pipe. There is no treatment infrastructure in the catchment.

Outlet 2: Hutchinson Road

The catchment is 12.39 Ha bounded by Hutchinson Road, Lyndoch Road and a ridge line located approximately mid-way between Hutchinson Road and Bella Street. Land use is mostly Residential (98% Residential, 2% Residential Historic). The catchment slope is approximately 4.0%, and drains into a 900mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 3: Edith Street-east

The catchment is 65.16 Ha, and extends southwards to Carlton Road, east to Holness Avenue and west to Warren Street. Land use is mostly Residential (61%) with remainder Residential Historic (39%). The catchment slope is 3.0% and drains to two pipes of 600 and 900mm diameter. There is no treatment infrastructure in the catchment.

Outlet 3-A: Edith Street-west

The catchment is 2.051 Ha, and collects the block bounded by Bridge Street North, Murray, Cowan and King Streets. Land use is entirely Town Centre Historic. The catchment slope is 1.0% and drains to two 450mm diameter pipes. There is no treatment infrastructure in the catchment.

Outlet 4: Murray Road

The catchment is 2.71 Ha, and extends along Murray Road from the causeway over the North Para to the southern and northern intersections of Flinders Street and Princess Street respectively with collection of the adjacent properties at the northern end. It is zoned as Residential, with a general slope of 3.0% to a kerb outlet on the causeway. There is no treatment infrastructure in the catchment.

Outlet 5: Main North Road/ Flinders Street

The catchment is 12.62 Ha, and extends southwards to a ridge line near Cowan Street and further westwards to another ridge line along Cameron Street. Land use is Residential (30%) and Town Centre Historic (70%). The catchment slope is 1.0% and drains to a 375mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 6: Burrows Street

The catchment is 11.62 Ha and bounded by ridge lines west and north of Burrows and Paxton Streets respectively and a further ridge line east of Barker Street. Land use in the catchment is entirely Residential. The catchment slope is 2.0% and drains to an apparent 300mm diameter pipe outlet. There is no treatment infrastructure in the catchment.

Outlet 7: Main North Rd, Gawler Caravan Park

The catchment is 5.97 Ha bounded on the west and south by King Street and Bridge Street North respectively, and the Gawler Caravan Park to the northeast. Land use in the catchment is mostly Special Uses (67%), with the remainder Historic Residential (33%). The catchment slope is 1.0% and drains to a 375mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 8: Drury Street

The catchment is 53.67 Ha and extends to in line with Drury Street westwards, to Chamberlain Road to the north and the Council Boundary to the east. Land use is mostly Residential (88%), with the remainder Residential Historic (12%). The catchment slope is 2.0% and drains to two pipes (525 and 825mm diameter respectively). There is no treatment infrastructure in the catchment.

Outlet 9: Main North Rd/ Paxton Street

The catchment is 1.31 Ha bounded by Main North Road, Paxton Street and a ridge line west of Drury Street. Land use is entirely Residential Historic. The catchment slope is 1.0% and drains to a 375mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 10: Main North Rd, North Para intersection

The catchment is 3.85 Ha and extends northeast along Main North Road to Drury Street and northwest to Redbanks Road and a ridgeline south of Ayling Street. Land use is mostly Residential Historic (67% Residential Historic; 18% Residential; 15% District Shopping). The catchment slope is 1.0% and drains to a 525mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 11: Weaver Driver

The catchment is 9.04 Ha and extends northwards along Brown Street to Ayling Street and further northwards along Redbanks Road to Holmes Street. Land use is mostly Residential (77% Residential; 14% District Shopping; 9% Residential Historic). The catchment slope is 1.0% and drains to a 600mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 12: Bright Street/ Weaver Driver intersection

The catchment is 7.14 Ha and extends north along Bright Street to Ayling Street and west to Beck Laneway. Land use is entirely Residential. The catchment slope is 1.0% and drains to a 450mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 13: South end of Panter Street

The catchment is 6.72 Ha and extends north along Panter Street to Holmes Street. Land use is entirely Residential. The catchment slope is 0.5% and drains to a pipe of unknown size. There is no treatment infrastructure in the catchment.

Outlet 14: Essex Park Tennis Courts

The catchment is 10.66 Ha, and extends south and north to Queen Street and King Street respectively. Land use is mostly Residential Historic (77% Residential Historic; 23% Special Use). The catchment slope is 0.5% and it drains to a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 15: Gawler Oval Station

The catchment is 11.26 Ha and is bounded by Cowan Street and Parnell Street to the south, Cameron Street to the east and Thomas Terrace to the north. Land use is 53% Residential Historic and 47% Special Use, which includes the Bowling Club. The catchment slope is 1.5% and it drains to a 525mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 16: Kelly Road, south end

The catchment is 91.97 Ha and is bounded by the railway and Sturt Highway to the west, Weyland Road and Redbanks Road to the north, and Jarvis Street to the east. Land use is 49% Residential, 20% Light Industry, 15% General Industry and 16% Special Use. The catchment slope is 0.7% and drains to a 1200mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 17: Nixon Terrace

The catchment is 1.95 Ha and collects the paved court area of the Gawler Oval sporting complex. Land use is entirely Special Use. The catchment slope is 0.4%, draining into a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

SOUTH PARA OUTLETS

Outlet 18: Southeast of Lundie Court

The catchment is 162.26 Ha and includes two sub catchments 18 and 18A. Sub catchment 18 extends north to Carlton Road, west to Cork Road, east to a ridgeline and south to the Council Boundary. Land use for the total catchment is 99% Rural and 1% Residential. The total catchment has an average slope of 2.3% and drains to the South Para via a grass lined channel. There is no treatment infrastructure in the catchment.

Outlet 18A: Cork Road

Upstream of Cork Road, the sub-catchment is 1.186 Ha, and extends north and west to ridgelines along Quarton Street. Land use is entirely Residential. The catchment slope is 1.4% and drains to sub catchment 18 via a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 19: Southwest of Lundie Court

The catchment is 8.83 Ha and includes two sub catchments 19 and 19A. Sub catchment 19 collects the land downstream of the development lines of Lundie Court, Broderick Court and Cork Road and extends eastwards to a ridge line. Land use for the total catchment is 89% Rural and 11% Residential. The total catchment has an average slope of 5.5% and drains to the South Para via a grass lined channel. There is no treatment infrastructure in the catchment.

Outlet 19A: Broderick Court

Upstream of Broderick Court, the sub-catchment is 1.01 Ha, and contained to the development within this road. Land use is entirely Residential. The catchment slope is 4.4% and drains to sub catchment 19 via a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 20: Southeast of Pile Street

The catchment is 30.18 Ha and includes four sub catchments (20, 20A, 20B, 20C), with outlets that drain to the South Para via a feeder stream. Sub catchment 20 extends south and west to a ridge along Pile Street. Land use for the total catchment is mostly Residential (87%) with remainder Rural (8%) and Special Uses (5%). The average slope of the total catchment is 4.7% and no treatment infrastructure is provided.

Outlet 20-A: Lundie Court/ Ronan Court intersection

The catchment is 25.28 Ha and extends north of Mahoney Street to a ridgeline along Popham and Barossa Avenue, east to East Terrace and west to Cork Road. Land use is entirely Residential. The catchment slope is 3.8%, and drains to through two pipes of 375 and 300mm diameter.

Outlet 20-B: end of Ward Terrace

The catchment is 0.40 Ha and collects the development along Ward Terrace east to the ridgeline. Land use is entirely Residential. The catchment slope is 1.0%, and drains to a 300mm diameter pipe.

Outlet 20-C: Lundie Court

The catchment is 0.63 Ha and collects the development along Lundie Court east of the ridgeline. Land use is entirely Residential. The catchment slope is 3.3%, and drains to a 300mm diameter pipe.

Outlet 21: Pile Street

The catchment is 5.06 Ha and extends west to Dawes Drive and north to a ridge line back from Gozzard Street. Land use is entirely Residential. The catchment slope is 5.3%, draining to a 375mm diameter pipe which then drains overland to the South Para. There is no treatment infrastructure in the catchment.

Outlet 22: Allwood Drive

The catchment is 1.69 Ha and extends west and east to ridgelines along Allwood Drive and north to Pile Street. Land use is entirely Residential. The catchment slope is 6.0% and drains to a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 23: Gawler Terrace – Gawler-One Tree Hill Road intersection (north)

The catchment is 15.86 Ha and extends between the north and south Gawler Terrace – Gawler-One Tree Hill Road intersections. Land use is entirely Residential. The catchment slope is 5.0% and drains to a 375mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 24: Allwood Drive – Nott Street intersection

The catchment is 10.92 Ha and extends westwards to Nott and Duffield Streets, north to a ridge line beyond Mortimer Road and east to Dawes Drive and a further ridgeline along Allwood Drive. Land use is entirely Residential. The catchment slope is 4.7% and drainage is into two (300mm and 450mm diameter) pipes. There is no treatment infrastructure in the catchment.

Outlet 25: Coombe Street

The catchment is 1.07 Ha and envelopes the allotments to the southwest of Coombe Street, bounded by Nott Street to the east. Land use is entirely Residential. The catchment slope is 11.6% and drains overland to the South Para. There is no treatment infrastructure in the catchment.

Outlet 26: First Avenue – Gawler Terrace intersection

The catchment is 6.76 Ha, and extends north and west to First and Seventh Streets respectively and south along Gawler Terrace to a ridge line. Land use is 78% Residential Historic and 22% Residential. The catchment slope is 2.9% and drainage is into three 300mm diameter pipes. There is no treatment infrastructure in the catchment.

Outlet 27: Murray Street

The catchment is 1.39 Ha bounded by Ayers Street to the north, Coombe Street to the east and First Avenue to the south. Land use is entirely Special Use. The catchment slope is 1.8% and drains to a 375mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 28: Murray Street – Ayres Street intersection

The catchment is 15.21 Ha and extends south to the Coombe Street/ Duffield Street intersection, east to McKinlay Avenue and north along Murray Street to a ridgeline before Thorupps Lane. Land use is 41% Residential, 33% Residential Historic and 26% Town Centre Historic. The catchment slope is 7.2% and drainage is into a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 29: Julian Terrace

The catchment is 0.92 Ha and is bounded by Julian Terrace, Bridge Street South and Murray Street. Land use is entirely Town Centre Historic. The catchment slope is 0.8% and it drains to a 450mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 30: Julian Terrace (Kingsford Hotel)

The catchment is 0.52 Ha and extends along Julian Terrace south to Bridge Street South and north to a ridge line before Whitelaw Terrace. Land use is entirely Town Centre Historic. The catchment slope is 1.4% and drainage is to a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 31: Walker Place – Whitelaw Terrace intersection

The catchment is 49.56 Ha approximately and extends east along Carlton Road to a ridge line beyond the Barossa Avenue intersection, south to a ridge line beyond Gozzard Street and north to Lyndoch Road. Land use is 45% Residential, 19% Residential Historic, 29% Town Centre Historic and 7% Special Use. The catchment slope is 2.8% and drainage is into three pipes (two 300mm and one 1200mm diameter). There is no treatment infrastructure in the catchment.

Outlet 32: Tod Street – Reid Street intersection

The catchment is 12.92 Ha, and extends west along Tod Street to Cameron Street, east to Commercial Lane and north to Cowan Street. Land use is 58% Residential Historic and 42% Town Centre Historic. The catchment slope is 1.2%, draining to a 750mm diameter pipe. No treatment infrastructure exists in the catchment.

Outlet 33: Schiebener Terrace

The catchment is 0.85 Ha, and extends north to Tod Street, west to Dundas Street and east to Whitelaw Terrace. Land use is entirely Residential Historic. The catchment slope is 0.5% and it drains to a 375mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 34: Eighth Street, north end

The catchment is 16.96 Ha, bounded by Thirteenth Street, Twelfth Street, Seventh Avenue and First Avenue. Land use is 79% Residential Historic and 21% Town Centre Historic. The catchment slope is 0.5%, draining to a 750mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 35: Dundas Street – Schiebener Terrace intersection

The catchment is 1.28 Ha, bounded by Scheibener Terrace, Tod Street and Fotheringham Terrace. Land use is entirely Residential Historic. The catchment slope is 0.5%, draining to a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 36: Glenelg Lane, north end

The catchment is 8.19 Ha, bounded by Glenelg Lane, Twelfth Street and Fourteenth Street. Land use is 11% Residential and 89% Residential Historic. The catchment slope is 0.9%, draining to a 525mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 37: Fourteenth Street Bridge

The catchment is 0.56 Ha, extends from the bridge south along Fourteenth Street to the Lawrence Avenue intersection and north to a ridge line along Fotheringham Terrace. Land use is mostly Special Use (84%) with remainder Residential Historic (16%). The catchment slope is 2.0%, draining through a kerb outlet. There is no treatment infrastructure in the catchment.

Outlet 38: Cameron Street/ Fotheringham Terrace intersection

The catchment is 1.71 Ha and extends west and east along Fotheringham Street to Patterson Terrace and a ridge line respectively and north to Jacob Street. Land use is entirely Residential Historic. The catchment slope is 0.6% and it drains to a 600mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 39: Paterson Terrace-east

The catchment is 0.76 Ha, enveloping a residential block bounded by Jacob Street and Paterson Terrace. Land use is entirely Residential Historic. The catchment slope is 1.0%, draining to a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 40: Paterson Terrace - west

The catchment is 7.59 Ha and extends northwards to the ridgeline along Cowan and Parnell Streets, west to Cameron Street and East to a ridge line between Nixon Terrace and the Barossa Valley Rail Branch Line. Land use is predominantly Residential Historic (75%) with remainder Special Use (25%). The catchment slope is approximately 2% and drains to a 600mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 40A: Trotting Track

The catchment is 6.11 Ha and collects the trotting track facility adjacent Patterson Terrace which lies to the east. Land use is entirely special use. The catchment slope is approximately 0.5% and drains to a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 41: Lawrence Avenue- east

The catchment is 4.18 Ha, bounded by Lawrence Avenue, Richards Avenue and Lynch Avenue. Land use is entirely Residential. The catchment slope is 0.5% and drains to a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 42: Lawrence Avenue/ Richards Avenue intersection

The catchment is 1.57 Ha, bounded by Lawrence Avenue and extends south along Richards Avenue to Lynch Avenue. Land use is entirely Residential. The catchment slope is 0.5% and drains to a 300mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 43: Lawrence Avenue, west end

The catchment is 13.57 Ha, bounded by the railway line to the west, southern ends of Richards and Fifteenth Avenues to the east and Sixteenth Avenue to the South. Land use is 56% Residential and 44% Historic Residential. The catchment slope is 0.6%, draining to a 900mm diameter pipe. A Gross Pollutant Trap lies in the Lawrence Avenue reserve area back from the outlet.

Outlet 44: Gawler Oval

The catchment is 2.43 Ha, enveloping the two ovals by the Gawler Primary School. Land use is entirely Special Use. The catchment slope is 1.8% and drains to a 375mm diameter pipe. No treatment infrastructure exists in the catchment.

7.4 GAWLER RIVER OUTLETS

Outlet 45: Gosford Street, north end

The catchment is 13.36 Ha, approximately bounded by Beadnell Terrace to the east, Ashford Street to the south and ridgeline in Brigalow Street to the west. Land use is entirely Residential. The catchment slope is 0.5% and drains to a 525mm diameter pipe. There is no treatment infrastructure in the catchment.

Outlet 46: Para Para Close

The catchment is 1.92 Ha, and collects the Para Para Close development. Land use is entirely Residential. The catchment slope is 0.5% and drains to a pipe of unknown size. A Gross Pollutant Trap lies upstream of the outlet.

Outlet 47: Penrith Avenue

The catchment is 28.61 Ha, bounded by Ryde and Dean Streets to the south, Beadnell Terrace and Briton Street to the east and Brigalow Street to the north. Land use is 72% Residential and 28% Rural Living. The catchment slope is 1.1% and drains to a 750mm diameter pipe. There is no treatment infrastructure in the catchment.

7.5 SUMMARY

7.5.1 Conclusions

This stormwater catchment analysis identifies the main stormwater inputs into the North Para, South Para and Gawler River within the Study Area, and any treatment infrastructure within the catchments. The treatment infrastructure provisions for the Study Area are limited to select locations within residential areas.

This analysis has found that the majority of stormwater inputs into the Gawler Urban Rivers collect from residential areas, with limited treatment infrastructure. The analysis has also identified that many of the outlet pipe diameters are too small for the catchments from which they collect, indicating that there may be insufficient capacity in the Gawler stormwater network to adequately deal with high flow events. A final conclusion is that the information held by Council regarding the type, condition and capacity of the existing stormwater infrastructure is, in areas, limited.

7.5.2 Opportunities

Treatment Infrastructure

There is considerable scope for additional treatment infrastructure within the stormwater network and within the river corridors themselves. As discussed above, there are few locations where stormwater is treated prior to its discharge into Gawler's rivers (see Figure 7.1). The Gawler River catchments Given the high proportion of sealed and impermeable surfaces within these catchments, the extent and nature of treatment infrastructure required should be reviewed. Table 7.1 below provides a brief overview of the possible treatment options and potential locations where treatment could be investigated. These options should be assessed in conjunction with a comprehensive stormwater audit as discussed below, in order to most efficiently prioritise funding requirements and identify those locations where stormwater treatment would provide the greatest benefit within available budgets.



Table 7.1 Stormwater treatment options and potential locations

River Catchment	Treatment Option	Location	Comment
North Para	Various	Clonlea	High biodiversity values in deep pools within Clonlea would benefit from installation of treatment infrastructure at various locations on Whitelaw Creek and/or the North Para.
	Drainage infrastructure upgrade	OUTLETS 5 & 8 Caravan Park	Bank stabilisation works have been undertaken as part of the Gawler Urban Rivers Project in the North Para channel in the vicinity of the caravan park. These outlets collect stormwater from large residential catchments both the south (Outlet 5, near the former BMX Park and Meals on Wheels centre) and north (Outlet 8, near the end of Drury Street) banks of the North Para.
	Watercourse design initiatives (e.g.wetland)	OUTLET 3 Clonlea	This outlet discharges water from a large residential catchment into the North Para immediately upstream of the Murray Road ford. Potential wetland construction at this location would complement the construction of the paths and bridge as part of the Gawler Urban Rivers Project.
	Watercourse design initiatives	FLOODPLAIN Golf course	Given the low lying and flood-prone nature of the golf course site, it may be feasible to rehabilitate the golf course area to provide a billabong-type environment, where periodic flows would provide benefits to flood management, water quality and biodiversity values. Alternatively, the golf course could be left as open parkland to manage or even divert flows during flood events. Vegetation of designed swales and river banks could be incorporated in the design to provide filtration and stabilisation.
	Drainage infrastructure upgrade	OUTLET 13 and vicinity Ellis Park	The impact of stormwater discharges along the North Para between the Murray Road ford and the river junction should be investigated with a view to replacing or upgrading infrastructure.
	Gross Pollutant Trap (GPT)	OUTLET 16 Upstream of the river junction	Industrial land use at Willaston north and west of the River Junction drains to the rivers with no treatment. Investigations into runoff collected from these areas should be undertaken to assess the need for treatment infrastructure for these catchments.

South Para	Drainage infrastructure upgrade	Sport and Recreation Centre	Stormwater from the Recreation Centre building currently discharges high up on the river bank, causing erosion problems. Changing the outlet so that the pipe discharges at the bottom of the river bed would avoid this damage.
	Infrastructure/ watercourse design	OUTLETS 30-34 Goose Island	These outlets drain over 80ha of residential and Town Centre catchment on either side of the South Para, with no treatment infrastructure. These outlets discharge into the South Para below Whitelaw and Scheibener Terraces. Treatment of stormwater from these catchments could provide considerable benefits to river health given the high intensity of land use within these catchments.
	Watercourse design initiatives	OUTLETS 25-26 and vicinity Between the Dead Mans Pass carpark and First Street bridge	
	Watercourse design initiatives	Downstream of OUTLET 23 Upstream of the Dead Mans Pass carpark, below the cliffs east of Gawler Terrace.	Establishment of a deep pool at the historic “waterhole” location could provide water quality and biodiversity benefits, particularly when combined with a GPT (see below). The deep water could provide an area of low velocity flow to ameliorate the erosive effects of high intensity rain events and flooding.
	Gross pollutant trap (GPT)	OUTLET 23 Upstream of the Dead Mans Pass carpark, below the cliffs east of Gawler Terrace.	Installing a GPT at this location prior to discharge into the “waterhole” location would provide benefits to river health and ecosystem biodiversity, particularly in tandem with the proposed “waterhole” project as described above.
	Watercourse design initiatives (e.g. drainage swales)	OUTLET 20A On drainage line from Mahoney St	This outlet collects from a large residential catchment, which then runs down a significant drainage line into the South Para at the eastern end of Dead Mans Pass. Incorporation of swales or other design elements into the steep drainage line should be investigated to assess the benefits to river health and erosion.
	Various	Gawler East	Development of the Gawler East area should incorporate stormwater treatment initiatives to ensure minimal impact to the South Para and tributary waterways.
Gawler River	Stormwater detention basin	OUTLETS 45-46 and vicinity Downstream of river junction	There are excellent opportunities for stormwater detention on the floodplain below the Roseworthy rail bridge for existing runoff from Gawler West and anticipated future developments in this catchment (e.g. Reid). There are also extensive areas where loam has been mined which could provide opportunities for stormwater detention and treatment.

Stormwater Audit

This stormwater analysis provides information about the nature and location of stormwater infrastructure that drains into Gawler's rivers, and identifies land uses in the catchments this infrastructure collects. However, stormwater infrastructure that does not drain directly into the South Para, North Para or Gawler River channels has not been assessed, including tributary watercourses. Additional information could provide Council with a greater understanding of their stormwater infrastructure assets and the requirements for upgrading or augmentation. In order to address the conclusions above and to provide information to better manage and mitigate any risks associated with the Gawler stormwater network, a comprehensive audit of Gawler’s stormwater system could be undertaken as a first step. Gawler's Strategic Plan 2010-2018 (Town of Gawler 2010) has identified the need for a stormwater audit (Strategy 4.3.2).

An audit would provide the following information:

- Confirm all stormwater infrastructure in the Gawler Council area, including: outlet size and location (much of which can be derived from this analysis); input locations; dimensions and locations of overland flows or channels (including infrastructure upstream of the outlets); and location and type of treatment infrastructure;
- Determine flows for each catchment and conduct a hydraulic check, based on outlet water levels, to confirm flows meet minimum requirements;
- Identify the appropriate drainage infrastructure (including pipe, channel and feeder stream) for the size of each catchment in the Gawler area, and identify locations where infrastructure may be insufficient;
- Identify appropriate types and locations for additional treatment infrastructure where land use indicates that pollution levels may be high (e.g., industrial, commercial and uncontrolled areas); and
- Provide sufficient data to update Council’s GIS database through confirmation from physical observations.

A comprehensive stormwater system audit would provide information to enable Council to:

- Identify and prioritise requirements to manage, amend or upgrade stormwater infrastructure in the Gawler area; and
- Provide improvements in pollution control and river health; and
- Identify measures to manage flood risk to assets and property, including infrastructure upgrades, watercourse management, or development and zoning controls.

This will be particularly important over the next 5 to 10 years in order to accommodate the anticipated significant developments in the Gawler area, and to mitigate any effects on the river corridors that are typically experienced with increased urbanisation (including increased runoff from catchment areas and increased pollution entering waterways).

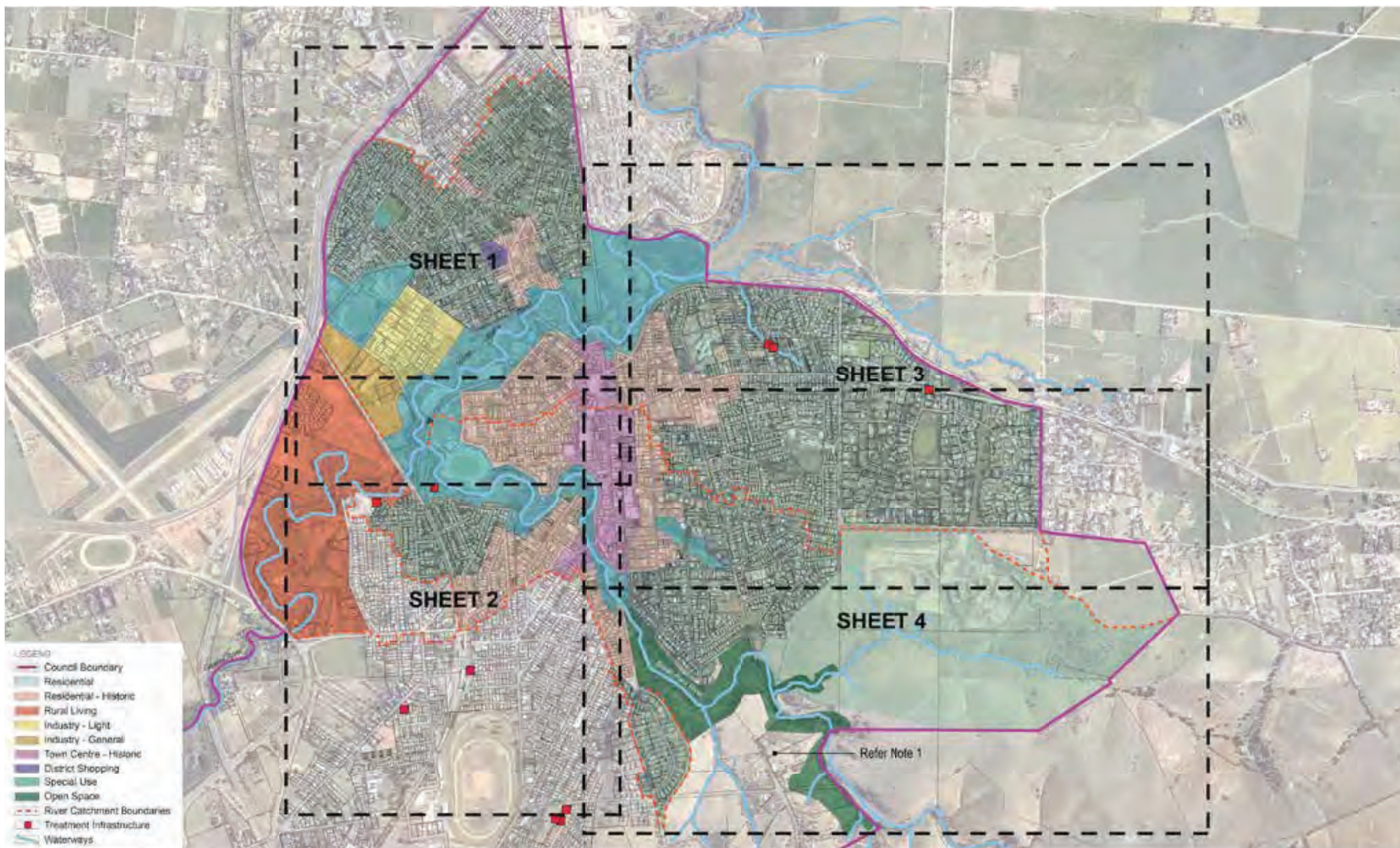
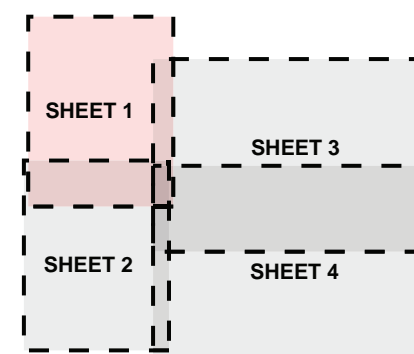
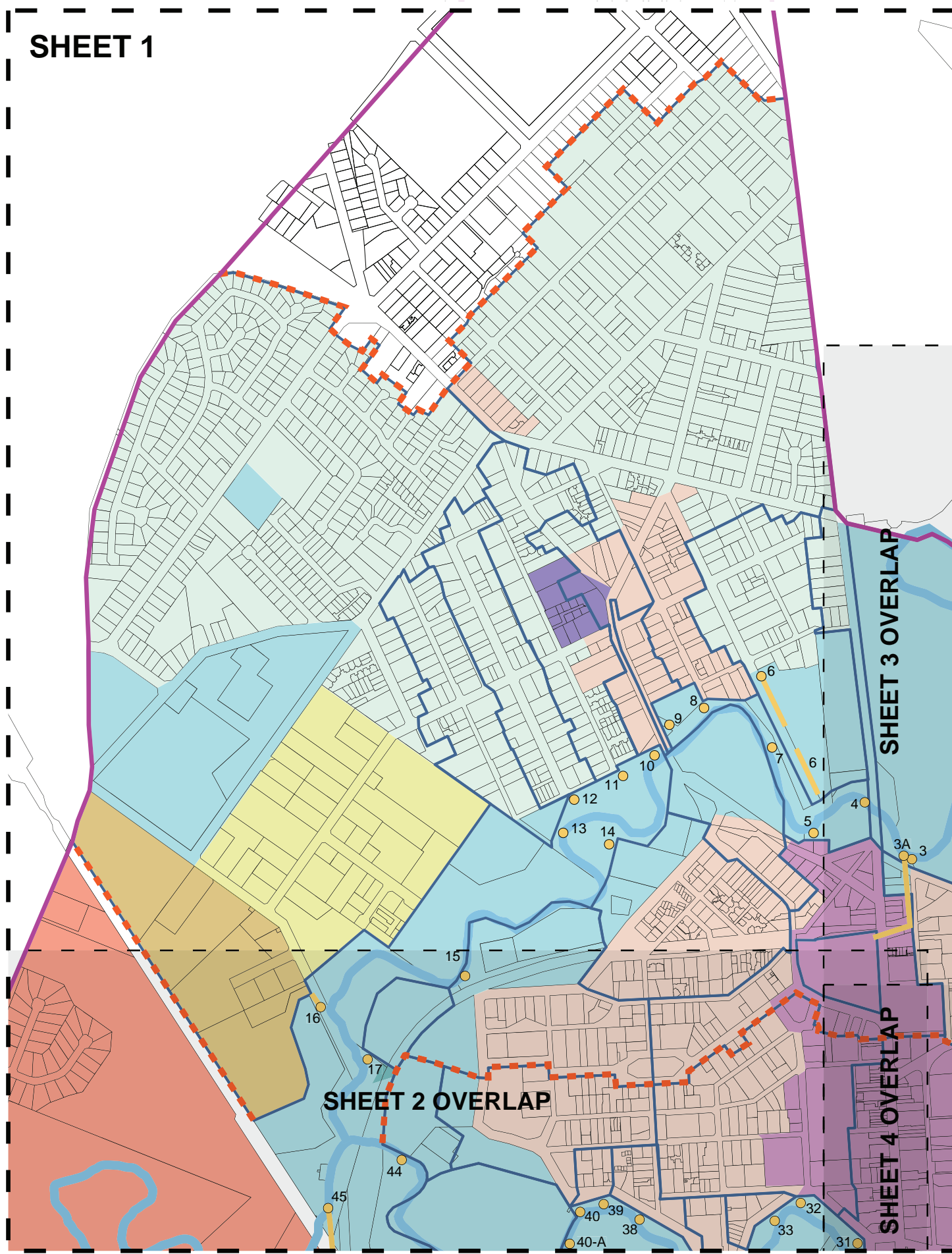
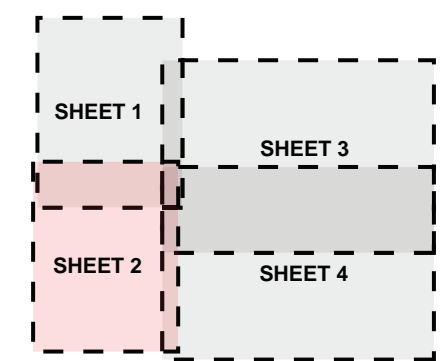
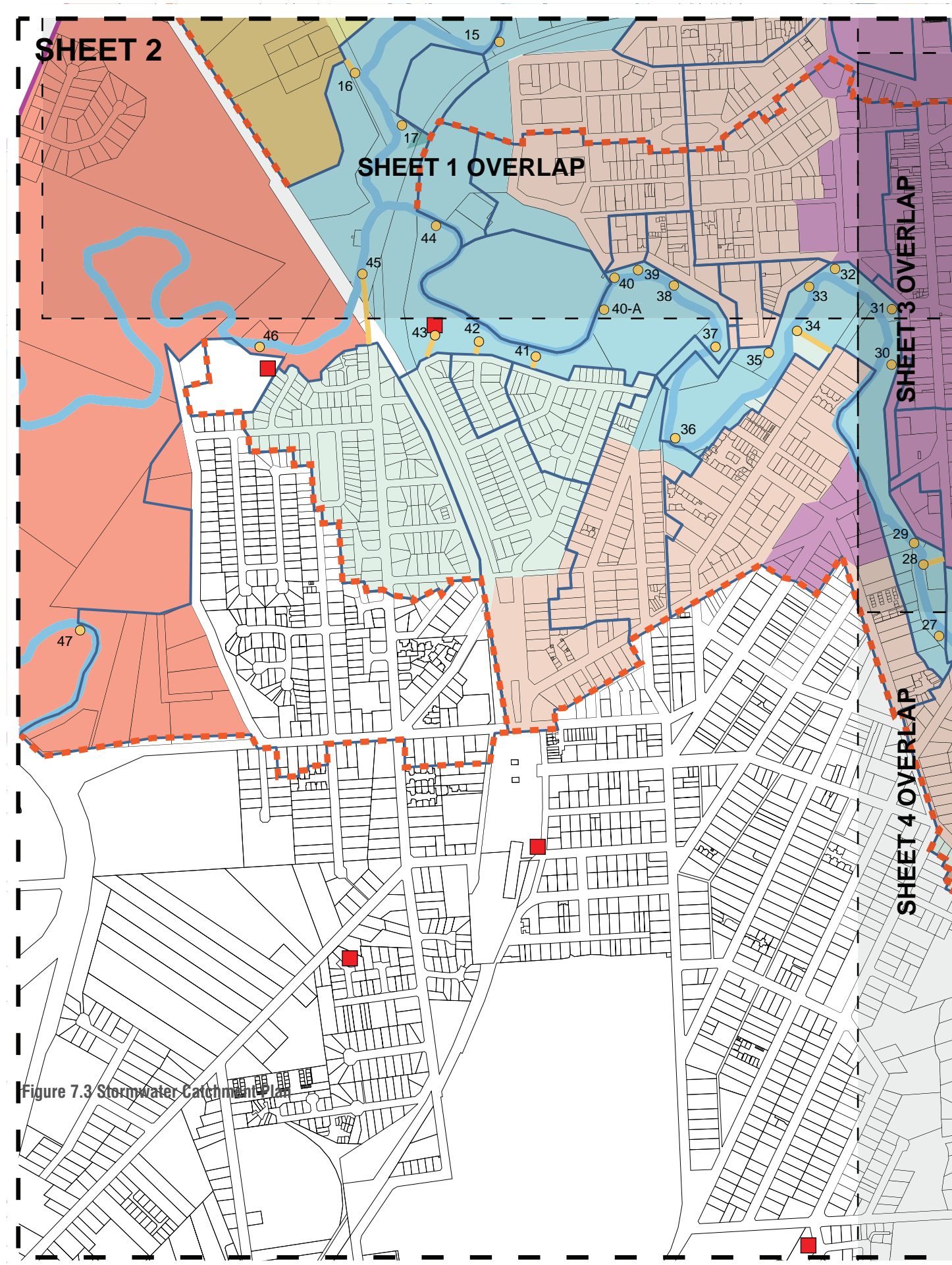


Figure 7.1 Stormwater Catchments - Index Sheet



- LEGEND
- Council Boundary
 - Residential
 - Residential - Historic
 - Rural Living
 - Industry - Light
 - Industry - General
 - Town Centre - Historic
 - District Shopping
 - Special Use
 - - - River Catchment Boundaries
 - Drains and Outlets
 - Outlet Catchment Areas
 - Waterways

Figure 7.2 Stormwater Catchment Plan



- LEGEND
- Council Boundary
 - Residential
 - Residential - Historic
 - Rural Living
 - Industry - Light
 - Industry - General
 - Town Centre - Historic
 - Special Use
 - River Catchment Boundaries
 - Treatment Infrastructure
 - Drains and Outlets
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 - Waterways

Figure 7.3 Stormwater Catchment Plan

Figure 7.3 Stormwater Catchment Plan

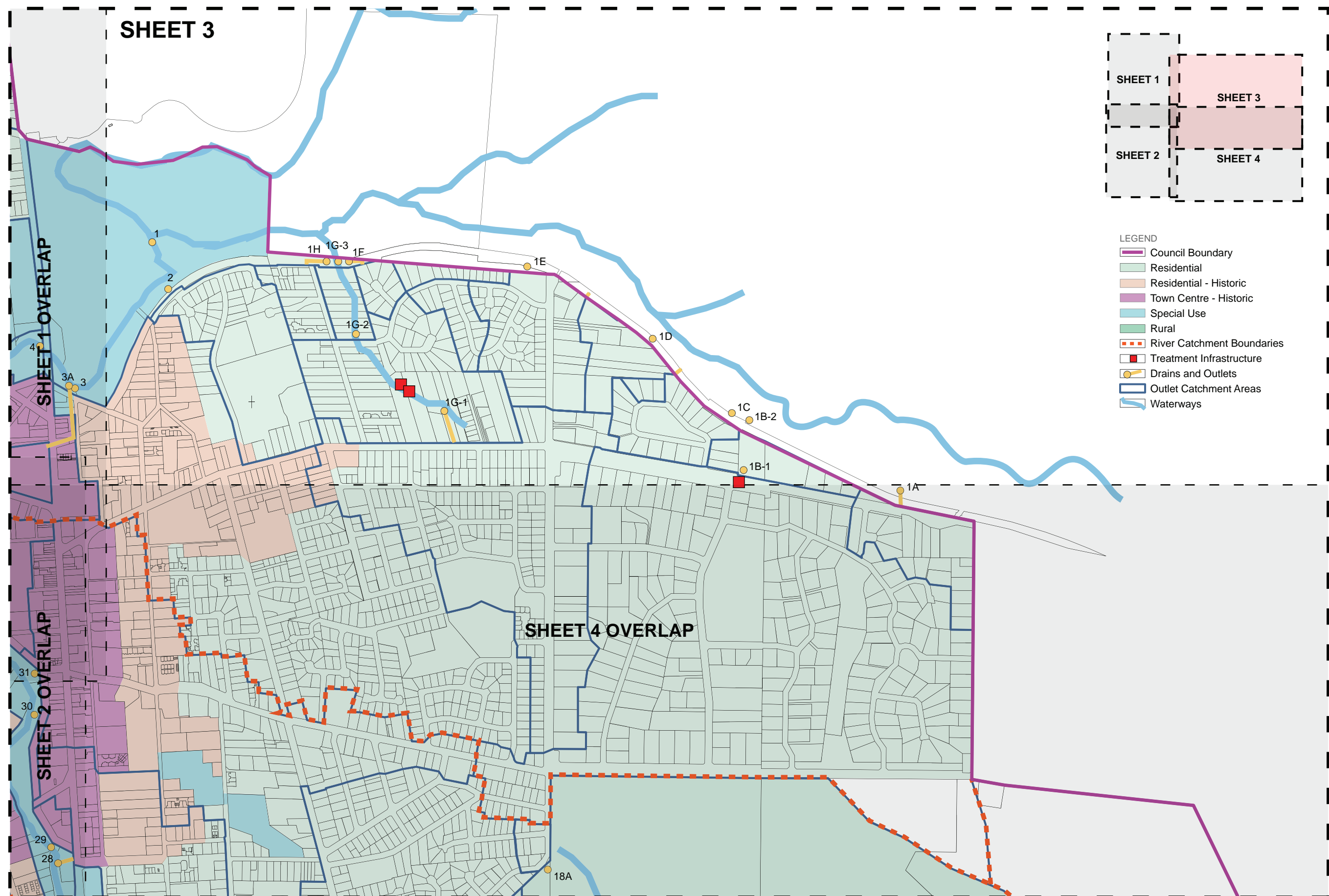


Figure 7.4 Stormwater Catchment Plan

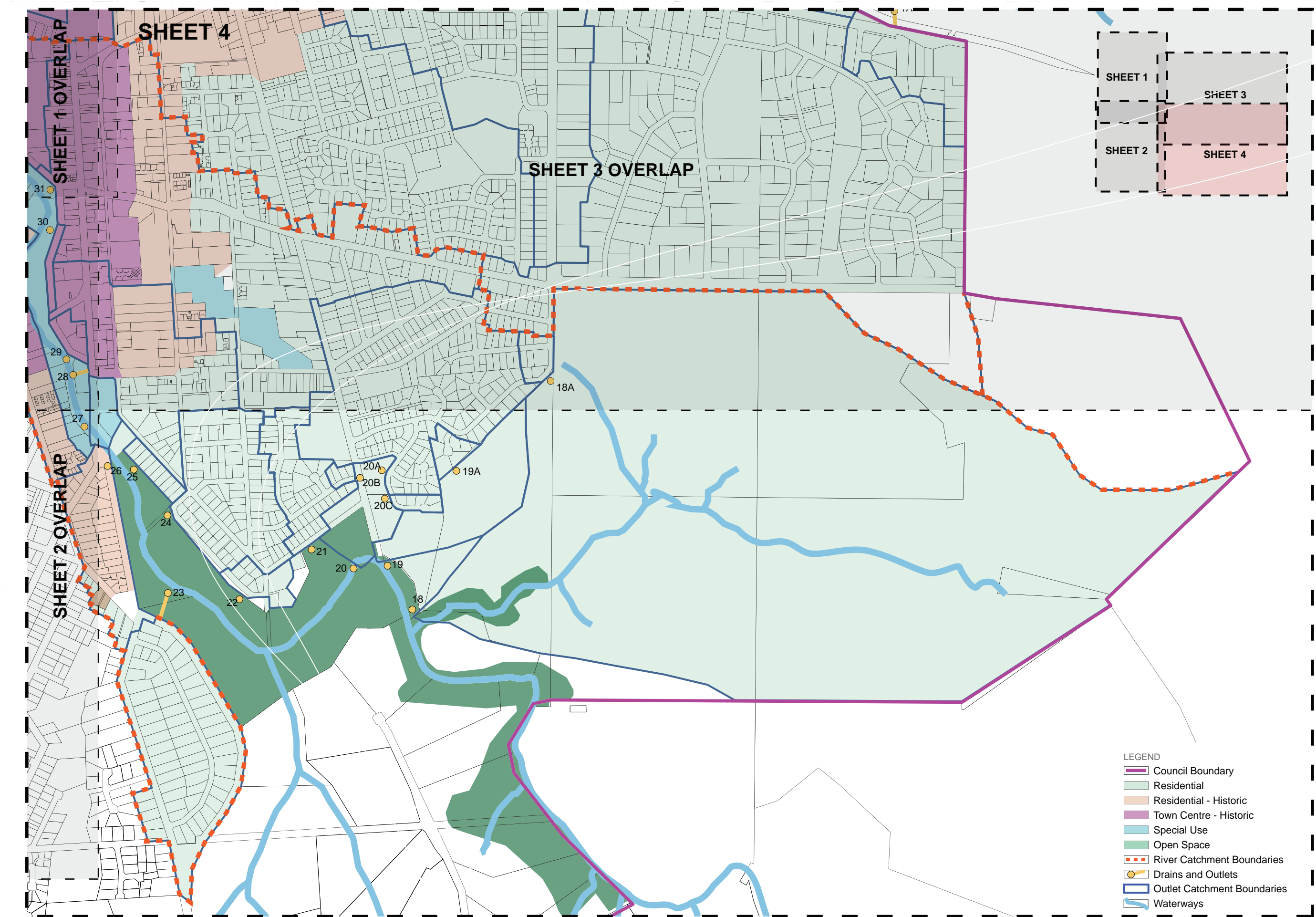


Figure 7.5 Stormwater Catchment Plan

Section 08 – Opportunities for Gawler’s River Corridors

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08 Opportunities for Gawler’s River Corridors

8.1 INTRODUCTION

Based on the analyses provided in Sections 2-7, this section of the Master Plan outlines recommendations and identifies opportunities for further investigations or activities that could be undertaken across the entire Study Area. Specific recommendations, issues and opportunities for each Precinct are identified in the individual Action Plans presented in Section 9. The major precincts involved in the Study Area include:

- Clonlea;
- River Junction;
- Gawler River;
- Gawler Central; and
- Dead Mans Pass.

Whilst previous studies and Action Plans have been created for the management of many of these recreational open spaces, the shift in social, environmental and cultural awareness may require the review of these Precincts. Detailed analysis of existing Council-wide land uses and potential uses will provide a basis for the future planning, design and management of these Precincts to reflect the cultural values of the current and future Gawler community.

8.2 DEVELOPMENT PLAN OBJECTIVES

In terms of recreation, the Development Plan supports the maintenance and development of open spaces in Council Wide Objectives 28 and 29 (DPLG 2011):

Objective 28 The development of public land within the Metropolitan Open Space System for active and passive recreation, sporting facilities and conservation with emphasis on retaining the open, natural or rural character with wide landscaped buffers around the perimeter of areas where appropriate, areas of conservation significance retained in their natural state and buildings located and designed in such ways as to minimise their impact.

Objective 29 The development of open space recreation reserves through land purchases, contributions of open space, and exchanges of land.

The objectives of the Gawler Development Plan highlight the importance of heritage, conservation and recreation to the character of the town centre. It also emphasises the importance of cohesive open space between the town centre and the parkland settings of the North Para, and South Para river corridors. This complements the objectives of the Gawler Urban Rivers Project and the sensitive integration of heritage and recreation development into the Study Area.

8.3 OPPORTUNITIES FOR GAWLER’S RIVER CORRIDORS

This section discusses potential for development or enhancement of Gawler’s urban river corridors, and the greater Gawler area.

8.3.1 Heritage and Cultural Values

Heritage Recognition and Heritage Walks

- The existing heritage walks focus on the historic Town Centre. These should be extended to cover key locations in the river corridors, including Clonlea, Dead Mans Pass and the River Junction. This would provide a link between the various river Precincts, and between the river corridors and the Town Centre, reinforcing the significance of the river corridors as central to the founding and design of the Gawler Township.
- Installation of interpretive signage at key points along the river corridors should be considered to tell the historic stories of the river from Kurna habitation to European settlement to the present.
- Additional emphasis should be placed on Colonel William Light’s links to Gawler, including the installation of new heritage interpretive signage to illustrate Colonel Light’s vision for and design of the Country Town (e.g., at Dead Mans Pass, and at Apex Park, close to the Town Centre).
- Consideration should be given to determining the cultural and heritage value of specific sites within the river corridor for formal recognition as Heritage Places. Consideration should also be given to registering the entirety of the river corridors in order to provide a mechanism for their ongoing preservation. The Adelaide Park Lands and City Layout have been designated a National Heritage Place. Using this example as a precedent, the Gawler parklands, particularly those connected with William Light and the town settlement, may have many similar claims for recognition.

Sculpture Walk

- The opportunity exists to create a ‘Sculpture Walk’, with sculpture and historic artwork placed along the shared use path throughout the river corridors, to enable users of the open space to appreciate of the historical and environmental significance of Gawler’s rivers.
- Public artwork could reflect the stories of Gawler and the stories of the rivers. Sculptures could reflect the heritage or environmental aspects of the location, e.g.: machinery at Apex Park; the horse jumps and Colonel Light at Dead Mans Pass; the Reid homestead at Clonlea; Indigenous heritage throughout the corridors; the railway bridges at the River Junction; ball sports at Essex Park; the waters of the river itself; and the flora and fauna that are part of, complement and enhance the corridors.
- Artwork could either complement or contrast with existing sculptures, and be complemented by interpretive signage.
- Artworks could be sourced from local artists, and providing a unique connection between the various Precincts along the river corridor. Public artwork is one way to further encourage local community involvement in the development and maintenance of the river corridor.
- “Talking sculptures” (e.g., of William Light, James Martin or involving Kurna groups) incorporating information signage and push-button recordings could be established at significant/ high traffic locations to provide a multimodal heritage experience along the rivers.
- Information boards which outline activities undertaken by local community groups (e.g., environmental studies by local students) are another way to engage public awareness while using the river corridor as an educational resource and tool.
- It is recommended that any information signboards or interpretation signs used along the riverine are consistent in materials and form to maintain the strong cohesive theme intended for the riverine parklands. The uniformity in material used will also enable easy maintenance and replacement for park managers.
- Encourage sustainable practices such as cycling by providing safe and accessible linkages and bike racks.

8.3.2 Recreational Values

Multi Purpose Sports, Entertainment & Events Facility

- The construction and management of sports facilities such as aquatic centres and sports stadiums has become more commercially focussed in recent years.
 - As much of the town of Gawler’s past investment in sports infrastructure is of standard that serves the organised sporting needs, it will be growingly important that Council respond to the shift away from organised sports at a local level In order to continue to provide for the long term needs of local organised clubs, Council will need to look towards building and operating multi-faceted sports, entertainment and event venues to cater for both local and regional demands within comfortable settings for its consumers.
 - Given that that the Gawler town centre’s catchment is 80,000 or more persons, it is likely that the catchment for a high quality elite level sport, entertainment and event centre will be considerably larger than that of the Town Centre. The centre of South Australia’s population is currently north and increasingly moving in that direction, with a projected population increase of almost 270,000 over the next 30 years in the Northern Adelaide and Barossa regions (DPLG 2010).
 - It is recommended that further consideration could be given to the establishment of tourism/events precinct adjacent and within the Gawler Parklands. This new precinct could seek to encourage new visitor accommodation, multi-purpose function facilities for hosting conferences and events. This should be sited and integrated with proximity to a future outdoor promenade and events area within Gawler’s park lands, just as the Riverside area creates for the City of Adelaide along the River Torrens.
 - While a more detailed vision, location study and business concept would need to be developed, it is likely that here would be significant merit for a Regional Sports, Entertainment and Events centre to be established within Gawler and within or near the Gawler Parklands. Such a unique development could serve two functions:
 - A safe place for families to be active and enjoy sports and other natural activities within one location; and
 - A facility capable of competing in the bidding for major events.
- A more detailed analysis is needed for a multipurpose facility and investigations need to fine tune the types of purposes that the facility should be geared towards. These could include:
 - Exercise;
 - Training;
 - Diet;
 - Education;
 - Entertainment;
 - Traditional health club facilities;
 - Climbing walls;
 - Pool facilities;
 - Indoor and outdoor skateboarding facilities;
 - Retail sales;
 - Serviced offices of allied consultants or industries;
 - Rental of recreational equipment;
 - Concert venue;
 - Child care;
 - Educational exhibits;
 - Cultural activities;
 - Personal fitness coaching;
 - Sports medicine;
 - Physiotherapy;
 - Services to cater for the aged market;
 - Host competitions;
 - Television events;
 - Learning/seminar centre;
 - Splash park and water slide adventure playground;
 - Learn to swim;
 - Gymnasiums;
 - Conference centres.
 - The location of any new facilities along the floodplain areas should be fully investigated to take into account the likelihood of flooding in these areas.
 - The cost of an aquatic centre and a multi-purpose facility is likely to be similar, with the multi-purpose facility being able to attract much higher levels of all year round use. Costs of such a facility could range between \$10 and \$40 million and need an area of between 1.5 and 3.5 hectares.
 - The location within Gawler Parklands would build from existing sporting facilities within the River Junction Precinct, and would provide for a significant and spectacular setting where design could create a seamless integration of indoor and outdoor areas. The location of the facility could be in the existing recreation node at Nixon Terrace, and capitalise on the existing facilities, including car parking, available in the Showgrounds/ Community Centre area. An alternative location would be Goose Island, although constraints at this site include the availability of land to provide sufficient car parking, and impacts on residential properties in the area. These problems could be ameliorated to some degree by purchasing a number of residential properties at the northern end of Eighth Street, increasing the land available for development as a community facility and reducing the area of open space required to establish such a facility. The “oval” area at Clonlea would be suitable and it is close to rail and town centre.

- In order to create an elite level facility, the facility would need to be of a sufficient size and capability that can bid for national and international event so that the Region can host major events. In order to achieve a regional scale facility that can successfully bid on events will require infrastructure such as:
 - seating capacity
 - accommodation villages (refer to Heritage recommendations for Clonlea Reserve)
 - area for television and media broadcasting
 - excellent transportation networks.

Aquatic Centre

- While there is no research from which the catchment of the existing Trevor Bellchambers Community Swimming Centre at Essex Park can be properly determined, different styles of aquatic centres will have different sized catchments, reach and demographic makeup. At present, we would expect the current outdoor swimming pool to be able to meet the needs of a ‘local catchment’.
- Rather than upgrade a local catchment swimming facility, there is possibly a significant and more economically viable alternative that a new aquatic centre be considered that is able to serve a far-reaching, regional market. The catchment differences will have significant variations in the nature of upgrades to the venues and indeed its location. It is certainly likely that an investment in the traditional outdoor pool will have limited scope for community benefit, not least because of the seasonality of its use. By way of illustration of the issue, the below summarises some of the findings of a study (Howat & Crilley 2007) analysing 108 public aquatic centres from throughout Australia, where aquatic centres are located in capital cities or regional centres, and have a minimum catchment population within five kilometres from the centre of 10,000.
- Well managed and marketed aquatic centres can provide a range of social benefits and uses such as:
 - Triathletes using aquatics programs as part of their training regime;
 - Women using aquatic leisure centres to get fit and lose weight before moving back into the workforce; and
 - Venue users building up social contacts with members of the wider community through participation in group activities
- Any new aquatic centre in Gawler should be built as a ‘year round’ facility to cater for different market sectors subject to detailed analysis of the catchment profile, being:
 - Recreation and leisure (reasonably expected to represent 60% to 70% of users)
 - Competitive, training and fitness market (20-30 % of users), and
 - Health and therapy markets (10-20% of users).
- A new aquatic centre would not have to be located on the site of the existing facility, which is spatially constrained. Its location, bounded by Main North Road, Victoria Terrace and the North Para river channel, provides little room for expansion of the centre itself or additional car parking. Alternative locations include Goose Island, or in the parkland area north of Lawrence Avenue. Any facility constructed here would need to take into account the propensity for the area to flood. Higher ground at Clonlea could also be suitable.
- For comparison, the recently completed South Australian Aquatic and Leisure Centre at Marion cost \$80 million to construct (City of Marion 2011). However, this centre includes a ‘GP Plus’ Clinic and is significantly larger than Gawler would require, given that the Marion centre was constructed to hold national and international events and service a much larger local and regional catchment.

Table 8.1 Aquatic Options Assessment

Future Pool Options	SWOT
Retain the pool and do not upgrade it	Limited council expenditure Reduced scope to provide new programs and activities Poor user experience Low use May lead to permanent closure
Retain the pool and upgrade	Allows for wider targeted markets to be served Gain community support Capital investment may not be cost effective
Construct new aquatic centre	Allows for wider targeted markets to be served (greater reach) Gain community support Avoids ineffective capital expenditure Requires larger footprint
Close and remove pool	Saves expenditure Frees up Parklands area Unpopular decision Fewer community facilities increases emigration for recreation

Skate Park

- There has been recent interest from local residents for the construction of a skate park in Gawler.
- Three sites were identified as potential locations for the new skating facility, being:
 - Goose Island (Adjacent to Apex Park)
 - Clonlea (Old BMX Track)
 - Essex Park (Adjacent to Trevor Bellchambers Swimming Centre).
- Each of the sites was assessed by residents in order to establish the appropriateness of the site based on the following criteria:
 - Accessibility: Can the site be easily accessed by pedestrians, cyclists and motor vehicles?
 - Supervision: Is the site monitored by passive and/or active sources?
 - Security: Can access to the site be restricted/ regulated, i.e., after hours?
 - Retail Facilities: Does the site provide appropriate access to required retail outlets, e.g. food?
 - Toilets: Are public toilets easily accessible from the site?
 - Land Use: Is the existing land use for the site/surrounding area appropriate?
- Table 8.2 indicates that the Essex Park site was seen as the most appropriate location for a future Skate Park. The location recommended is the same location where a regional Multi Purpose Sports Entertainment and Events Centre could exist; such a Centre could integrate an indoor/outdoor skateboarding facility.
- Further study is being undertaken by the Town of Gawler to identify the most appropriate location for a Skate Park.

Table 8.2 Site Suitability for future Skate Park

Proposed site	Accessibility	Supervision	Security	Retail Facility	Toilets	Land Use
Goose Island	High, directly adjacent to Town Centre	Medium, passive supervision only	Low, Open public area	Medium, walk to shops and services	High, existing in Gawler Central	Medium, public park surrounded by residential and historic town centre
Clonlea	Medium, edge of town centre	Low, limited foot traffic, passive supervision only	Medium, open public space, could be fenced as required	Low, larger distance to services	Medium, some distance to existing public toilets	High, similar previous use in public area
Essex Park	Medium, edge of town centre	High, direct supervision from swimming centre staff	High, incorporation with swimming centre, fenced off, close to police station	High, use of existing swimming centre kiosk	High, existing swimming centre toilets	High, predominant recreational usage

Transport Connections

- Extend trail network to link to and travel through adjoining areas, including Concordia, Reid, Roseworthy and the Barossa, to create a regional cycling network. Concordia and Roseworthy have been identified as growth areas in the 30-Year Plan for Greater Adelaide (DPLG 2010), and the option for non-vehicular connectivity should be investigated in consultation with the Light Regional Council and Barossa Council.
- Extend shared use paths and pedestrian paths through the areas of Gawler beyond the river corridors to provide safe access throughout the Town of Gawler municipality.
- Install bike racks at strategic locations to encourage cycle use rather than increasing vehicular traffic in Gawler. For example, bike racks, or a dedicated undercover bike park area (with lockers etc) could be installed at the Gawler Central train station to enhance connectivity with public transport.
- Additional pedestrian/ cycle river crossings should be considered at the following locations to provide enhanced access and connection over the North Para:
 - North of the netball courts to link to Willaston (this location was originally considered as part of the Gawler Urban Rivers Project but was not completed due to budgetary constraints);
 - Depending on the future land use, at the caravan park (this location was originally considered as part of the Gawler Urban Rivers Project but was not completed due to budgetary constraints).
- Additional pedestrian/ cycle river crossings should be considered at the following locations to provide enhanced access and connection over the South Para:
 - Below the southern end of Lundie Crescent to link Dead Mans Pass with the proposed Gawler East development (any bridge or path work here would have to consider impacts to biodiversity, as there is considerable vegetation cover in this area);
- Additional pedestrian/ cycle river crossings should be considered at the following locations to provide enhanced access and connection over the Gawler River:
 - West of the Roseworthy rail bridge to link to the residential developments at Reid (off Paternoster Road);
 - The existing Winkel Road/ Two Wells Road bridge should be assessed to determine if an additional non-vehicular crossing is required.

Fitness Trail

- The feasibility of a Fitness Trail extending from Clonlea to Dead Mans Pass should be investigated.
- A Fitness Trail could focus around the existing cycling path network, and provide Fitness Nodes in high traffic areas, including Clonlea, (e.g., near the existing children’s playground) River Junction (e.g., ear the existing facilities at the Community Centre or in the golf course area if this land is retained by Council), Apex Park (e.g., Goose Island, along Schiebener Terrace) and Dead Mans Pass (at the car park or near the new low level bridges below Pile Street), with possible extensions into the proposed Gawler East development in the south, and Willaston and Hewett in the north.
- Fitness Nodes could include the installation of a range of outdoor exercise equipment. Similar examples in SA include Fremont Park, Elizabeth, the Adelaide Parklands (University Loop), Semaphore Esplanade, and Millicent in the South East.
- Costs would be in the order of \$30,000 for the installation a set of equipment (4-8 pieces) on a rubberised surface 5-9 metres in diameter. The equipment would require maintenance to the same extent as existing children’s playground equipment, and would have an estimated lifespan of 10 years (Unley Council 2007).
- Spreading the equipment out in multiple Fitness Nodes along the river corridors would encourage exercise between the different Nodes to provide an exercise circuit along the river corridors.
- The Fitness Trail would require associated signage, and could be utilised by individuals or by personal trainers associated with local fitness companies and gyms.

Recreation Events

- Establish annual events centred on Gawler’s river corridors, such as a “Tour de Kids” (to complement the Tour Down Under) or a “River Fun Run”. The start could be at Dead Mans Pass, with finish points for various ages or ability levels at Goose Island (2 km), adjacent to the netball courts at Essex Park (4km), or Clonlea (6.5 km). The containment of such an event within the river corridors would enable the event to be held in a safe environment with minimal road crossings (First Street at the intersection of Gawler Terrace; Fourteenth Street east of the bridge; Hallam Drive Shared Uses Zone; Barber Street; and Murray Road south of the ford), and would encourage physical activity.
- Establish ongoing events such as a River Challenge, similar to the Corporate Cup, which has held been around the Torrens River in Adelaide every year since 1980, and now has regional events at Flinders University, Mawson Lakes and Port Adelaide (Life. Be In It 2010). Teams of 5-7 runners or walkers from local businesses complete a course every fortnight, and the average time for each team is recorded. The winning teams are those with the fastest average times and those who show the greatest improvement. The “River Challenge” could use the same courses as those as the proposed “Tour de Kids”.

8.3.3 Landscape, Land Use and Amenity

Gawler Rivers Linear Park

- Consolidation of existing open space within the river corridors to formally establish a Gawler Rivers Linear Park, which should consider the following values:
 - Heritage and Culture;
 - Recreation;
 - Land Use; and
 - Biodiversity and Environment
- Within these values, the overall aim of a Gawler Rivers Linear Park should be to optimise the following aspects:
 - Vegetation: revegetation, infill planting, and weed management to sustain a healthy and stronger ecosystem;
 - Activity: organising passive and active outdoor recreational to ensure the needs of the community can be met without damaging the natural environment; and
 - Movement: ensure linkages throughout, making each route safe and enabling access for both pedestrians and cyclists.

Open Space

- Pressures on Gawler’s open space network will increase significantly with the anticipated population growth in the region and in the Town itself. Management of open space areas should be consistent with the principles outlined in Table 8.3 below.
- Opportunities exist to consolidate Gawler’s current open space provisions, particularly along the river corridors, by enshrining the protection of these open space areas through zoning or heritage provisions.
- Confirmation of property boundaries along the river channel should be undertaken (by survey if necessary) and record in Council’s GIS system to ensure no boundary creep of private properties further into the river corridors.
- Council should investigate opportunities to maximise the civic parkland and protect the river corridors by purchasing privately held land immediately adjacent to the river corridors (or entering into agreements with the owners of these properties), particularly in areas where the banks are steep and there is limited flat floodplain area (e.g. east of and parallel to Seventh Avenue).
- Establishment of parkland in these areas (e.g., Goose Island) will reduce the potential for flooding damage to residential properties, enable remediation of unstable and unconsolidated areas by providing greater scope for bank stabilisation, flood management and erosion control measures. Steep banks in many areas pose the risk of erosion and collapse; establishment of parkland in these areas will enable protection and remediation of unstable and unconsolidated areas

- Additional parkland will provide protection and enhancement of ecological values within the river corridors.
- Creating greater open space along the river corridors will provide greater visual amenity, visibility and security along the river corridors.
- Council should also investigate the feasibility of re-zoning low-lying areas, or tightening development provisions to prevent or restrict development in low-lying areas, including properties outside of the Gawler Rivers Flood Plain Policy Area, or properties that could provide additional flood management or biodiversity benefits. Areas include Goose Island, the golf course, and areas along Gawler River west of Roseworthy rail line.

Table 8.3 Principles for Open Space

Purpose	Description
Preserve and protect natural and cultural environment	Open space should protect and enhance natural and cultural environments, particularly areas of remnant vegetation or habitat and those areas of indigenous and post European contact cultural value. Appropriate restrictions and buffer areas will be needed to protect higher value conservation areas from unwanted impacts.
Reflecting community needs	Open space provision and use decisions will be guided and influenced by, but not necessarily limited to, information from local and municipal communities on their open space interests, needs and aspirations; by demographic characteristics, and by information on the types and patterns of leisure activity pursued by the community.
Enhancing recreation and tourism opportunities	Ensure that open space importance of recreation and tourism to Gawler, and the regional economy.
Improving provision and optimizing access	Decisions on open space acquisition, management and use will give a high priority to creating an equitable distribution of open space and types of open space across the Council area. Particular attention will be given to providing and developing open space linkages between different open space resources and different parts of Gawler, and to activity nodes where linkages are difficult but compatible uses are concentrated.
Ensuring diversity of provision	Ensure that open spaces with a wide range of characteristics are provided and that in making this provision, conservation and heritage values are retained and, where possible, enhanced.
Expanding the network of linkages	Ensure that existing pedestrian and bicycle trail networks are enhanced and that additional provision is made to effectively meet recreation and commuter needs.
Providing for people with disabilities	The planning and provision processes must ensure that the needs of community members, including those with disabilities are provided for.
Site responsive uses	Ensure that the uses of open spaces are appropriate to the nature, sustainable capacity and characteristics of the sites.
Maintenance	Ensure that open spaces are sited, planned and maintained to agreed service and safety standards, with due regard to economic sustainability.
Providing clear guidance to Council	The open space planning process must provide Council with guidance as to development and management actions, which are affordable and are consistent with government policy and funding criteria.
Contribute to social and/or economic well-being and growth	Open space planning and provision should contribute to the social and/or economic well being of the community.
A flexible and long term focus	The planning process should focus on long term strategic outcomes so as to provide flexible opportunities to meet and adapt to future needs. The outcomes of planning and management should ensure that alienation of open space is minimised.
Provision partnerships	Opportunities for partnerships in the provision and management of open space should be integral to the planning process.

Landscape Design Principles

- Identify existing natural and cultural values, protect and enhance its character within the landscape;
- Improve the health of the river by implementing sustainable practice to better manage the river system through storm water management, landscaping and weed and pest control;
- Create a connecting riverine landscape which provides for high biodiversity and social values through strong visual, vegetation and pedestrian links;
- To manage and control weed species that is displacing the natural landscape character through sustainable practices, and to re-vegetate simultaneously with the plant removal;
- To provide a high level of amenity through design considered material, furniture and planting selection. Where protecting the heritage value is a priority, use materials and colours that are complementary to heritage feature(s);
- To encourage design structure that is complementary to the natural landscape and riverine environs;
- To acknowledge and appreciate the history of the Gawler township establishment through ‘interpretive’ signage, artwork and story board that articulates the stories of the river system for the appreciation of both the local community and visitors to the area;
- To provide a guideline for upgrading and implementing of community facilities including barbecue’s, picnic areas, playgrounds, park furniture and car parking with a strong consistent landscape style that will integrate an otherwise fragmented open space system;
- Enhance the quality of the riverine corridor by offering a wide range of attractions to locals and tourists;
- Establish a system for the on-going monitoring, evaluation and corrective actions; and
- Provide a high quality riverine landscape that is unique to the Gawler Township.

Furniture

- Street furniture design and implementation should be consistent with the style guideline proposed within this Master Plan. A consistency of style, material and finishes should promote unity and identifiable to the Gawler Township.
- Furniture should be durable, low maintenance and easy to procure and replace.
- Fencing and bollards are intended to deter vehicle access to the parks and reserves, yet permeable to enable pedestrian access and/maintenance access.
- Fence and bollard posts should be timber finish preferably durable hardwood to complement the natural riverine environment or recycled plastic where appropriate.
- Bins should be located at specific locations to enable easy maintenance access.
- Recycle bins should be installed at public areas to encourage sustainable recycling practices.
- Dog litter bad dispensers should be installed to encourage responsible practices by pet owners.
- Bicycle racks should be provided to better service cyclists and encourage ‘park and ride’ commuters.

Security

- Lighting should be provided at key locations such as car parks and function areas to enable safe access along pathways.
- Community Protection Through Environmental Design (CPTED) principles should be considered when developing areas isolated from public thoroughfares.

Structures

- Any structures proposed along the riverine corridors should be sympathetic to the natural river environment and not be visually distracting or intrusive.
- Consideration should be allowed for sustainable designs (see below).

Sustainable designs

- Sustainable and best practice is encouraged through the river corridors
- Appropriate planting species should be selected for each area to complement the terrain and land uses
- Water Sensitive Urban Design initiatives should be considered where possible
- Sustainable practices, product longevity, maintenance and replacement issues should be considered
- Installation of water storage tanks collecting roof runoff from toilets and other structures (e.g., picnic shelters) should be considered

8.3.4 Biodiversity and Environmental Values

Biodiversity Highlights Path

- To complement the Fitness Trail and Heritage Walk concepts listed above, Council could consider the establishment of a Biodiversity Trail.
- A Biodiversity Path could link with existing signage on environmental protection works, and expand on these by including information on:
 - local flora and fauna species, communities and ecosystems;
 - pre-European vegetation and fauna assemblages;
 - the impact of clearing, development introduction of exotic pests;
 - the importance of conserving, enhancing and protecting the remaining habitat for native fauna;
 - local vegetation species used by the local Indigenous groups for food or craft materials (in consultation with local Kaurna groups).
- This concept could be an important mechanism for raising the profile of the river corridors, highlighting their vulnerability and providing education on how to protect and enhance native ecosystems in the Gawler region.
- The Biodiversity Path could include information on the activities of local groups active in conservation works along the river corridors, to encourage further community participation, particularly by schools, local youth groups and sporting clubs.
- By raising the profile of the riverine environment and encouraging knowledge and participation, the community will gain additional ownership of the issues and problems faced by the river corridors, and therefore will be more inclined to contribute to their protection.

Conservation Planning

- Conservation areas maintained by different local groups should be identified.
- All information regarding weed control, revegetation and other environment protection works should be consolidated.
- A consultative process should be developed and implemented, so that conservation programs can be undertaken in an integrated manner, and so that Council and relevant community groups can communicate with regards to their respective priorities and objectives for each site.
- This will enable Council to have a clear understanding of the priorities within the river Precincts, and to be able to support funding applications to State and Commonwealth bodies from a position of knowledge.

Revegetation Design Guidelines

- Planting and revegetation areas should be consistent and protected. New planting areas should be protected from unauthorised access and grazing with fencing or tree guards and plastic sleeves. Fenced planting areas will also enable easy detection of revegetated areas in large reserves.
- Public awareness should be made to revegetated areas along with signage to inform the significance of the planted community to enable public interest and a follow up its the planting progress. Such awareness and protection will indicate a well managed area to deter unauthorised access and vandalism.
- Planting of non-indigenous natives should be discouraged wherever possible or practicable.

Weed Removal

- A Weed Management Strategy should be established for the river corridors. This should be based on the existing management strategies for each precinct, but should be consolidated and monitored so that areas can be prioritised, and the frequency and nature of any periodic works can be programmed into Council's budget.
- This should link in with the Conservation Planning initiative recommended above, so that both Council and relevant community groups can communicate with regards to their respective priorities and objectives.
- Programs to discourage planting of garden plants which can spread from gardens to the river corridors should be put in place. Particular focus on major new development areas should be a priority. Such programs can complement programs to encourage planting of suitable local natives in gardens.

Section 09 – Action Plans

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09 Action Plans

9.1 AIM OF THE ACTION PLANS

The broad aim of the Action Plans is to provide council, reserve managers, community groups or individuals who are managing and undertaking works within the river Precincts, with a framework to guide the remedial process for the Gawler Urban Rivers through a suite of key concepts and recommendations.

The Master Plan has identified the values of the riverine corridor and the threatening processes which can be remediated through the appropriate actions prescribed. The Action Plans can therefore be used as management tool to identify and prioritise actions to protect, develop and enhance the river corridor.

9.2 INTENDED USE OF THE ACTION PLAN

The Action Plans provide recommendations for:

- Improving recognition of the heritage aspects of the river corridors;
- Increasing the cultural amenity of the river corridors;
- Reducing deleterious impacts of the river corridors (namely vegetation and habitat destruction) for both the local and wider community;
- Providing safe access to and use of the reserves through improved access paths, site management and surveillance;
- Upgrading and augmenting public infrastructure and amenity for the enjoyment of the local community and visitors to the area;
- Improving the visual amenity to attract and encourage better use of the riverine reserves; and
- Restore the health of the river system.

Action Plans have been prepared for each of the major precincts involved in the Study Area, including:

- Clonlea;
- River Junction;
- Gawler River;
- Gawler Central; and
- Dead Mans Pass

ACTION PLAN – CLONLEA PARK PRECINCT

Clonlea Park is currently developed as a recreational ground, servicing the northern residential community of Gawler and wider region. The river flats offer substantial open space opportunities for the community. Some of these recreational opportunities have been realised in the form of playing fields, walking tracks, picnic areas, toilets facilities, tennis courts and car parking facilities in the south west of the reserve.

The northern sections of the reserve provide more passive recreation activities. Informal walking paths leads to the higher slopes allowing extended views across the river valley whereas walking tracks on the lower flats providing access to the water edge and permanent water holes. The permanent water holes environment provides an important habitat for fauna in the area. Healthy tree canopies line the North Para, providing a distinctive natural character and habitat value.

While the adjoining river flats are mown regularly for walkers and dog users, the western slopes are relatively undeveloped.

A substantial parking area sits almost redundant at the top of these slopes whereas it could provide an ideal location for views across the reserve as well as providing formal connectivity to the upper section of Clonlea Park from the adjoining playground and open space below.

The eastern side of the river is developed mainly for walking tracks and a buffer zone of non-indigenous native plantings separates the reserve from adjoining rural land.

The slopes of the southern section of the reserve grade from undulating to steep. Some areas have been used for BMX bike riding and jumping which has caused damage and erosion. The character here is mixed, with a combination of natural areas (north-facing steeper slopes), a heavily vegetated (exotic) creek line (Whitelaw Creek) and cleared slopes.











Opportunities exist to develop each of these areas into distinctive activity areas based on the existing landscape character and landform. Provisions of accessible paths network will enable better connectivity to these different activity areas as well as streamlining access preventing unauthorised entry into protected and/or conservation areas.

CP	CLONLEA PARK	
CP1.0	HERITAGE AND CULTURAL VALUES	
CP1.1	Recognising the Heritage Values of the area	
	Provide new interpretive signage describing the spiritual significance of the area to the Kurna people.	M
	Provide new place markers identifying the Reid family settlement, and other early settlers in the area.	M
	The opportunity for greater linkage to the Old Spot Hotel on Murray Street (financed by Reid) and Clonlea Reserve could be made through land use changes near the Reserve. The development of the connectivity of the historic Old Spot Hotel and Clonlea Reserve has the potential to provide visitors an appreciation of the history of the area.	L
CP1.2	Cultural Values	
	The opportunity exists to create a ‘Sculpture Walk’, with sculpture and historic artwork placed along the shared use path throughout the river corridors, to enable users of the open space to appreciate of the historical and environmental significance of Gawler’s rivers. The values of the river corridors can be illustrated through the artwork (which could either complement or contrast with existing sculptures) and interpretive signage.	
	Artwork at Clonlea could reflect the area’s significance to the Kurna, or its more recent history as the location of the first homestead in the region, established by the Reid family (see CP1.1).	
CP2.0	RECREATIONAL VALUES	
CP2.1	Recreational Opportunities – Fitness Circuit/ Fitness Node	
	The opportunity exists to encourage increased use of the Clonlea region through establishment of a Fitness Circuit linked to the new cycling and walking networks. Clonlea is ideally placed to provide a node for a Fitness Circuit, with permanent outdoor gym facilities including chin up bars and other exercise equipment.	
CP3.0	LANDSCAPE, LAND USE AND AMENITY VALUES	
CP3.1	Improve Access, Linkage, Integration and Connection of the River Corridor Parklands	
	Develop a plan showing the different precincts and activity areas within Clonlea Reserve and improve the landscape quality to enhance the existing landscape character(s) within the Clonlea Reserve.	H
	Capitalise on new access paths and safe crossings to link the activity areas within Clonlea Reserve to adjacent reserves along the riverine corridor and deter unauthorised access into sensitive and/or conservation areas.	H
CP3.2	Installation of Signage and Park Furniture	
	Install signage to link to existing Gawler Heritage Walking Trail	
	Install directional and interpretive signage to direct park users and highlight important precincts and conservation areas.	
	Install park benches and rubbish and dog litter bins at resting points along walking tracks.	
CP4.0	BIODIVERSITY AND ENVIRONMENTAL VALUES	
CP4.1	Conservation Planning	
	Considerable conservation efforts have been undertaken in the Clonlea area by a number of dedicated community groups and Gawler Council. Conservation areas maintained by different local groups should be identified and information regarding weed control, revegetation and other environment protection works should be consolidated. A consultative process to develop, implement and update a conservation program for the entire Precinct should be established.	H
CP4.2	Conservation Zone 1 - North Facing Slopes	
	The skeletal clay slopes which are, in the main, north facing, have a number of significant plant species on them. These slopes are susceptible to erosion, both natural and human induced. By far the greatest threat to vegetation is the high rabbit population with large bare areas being attributed to their grazing. In several areas the amount of digging has been sufficient to lead to sheet erosion.	
	Enhance the car park area at the upper slopes and develop this area to make it appealing through revegetation.	H

	Provide formal access paths to better direct pedestrians and bike users and to deter unauthorised access into revegetation zones.	H
	Outside the rivers, re-establish the Mallee Box Eucalyptus porosa open woodland and grasslands as part of the vegetation program.	H
	Monitor banks and control erosions via suitable engineering methods, including rock beaching where required and implement a revegetation program to redirect water and stabilise banks.	H
	Implement rabbit control program to protect new seedlings and planted areas via use of plastic tree sleeves and stakes to new tubestock planting and/or rabbit proof fencing around large planting areas.	H
	Install information signage to direct access and protect conservation areas.	H
CP4.3	Conservation Zone 2	
	This area provides picturesque views across the North Para and opportunities arise to provide for a resting point for path users, and the valley below contains important habitat values for water birds.	
	Maintain the existing waterholes to encourage biodiversity and habitat values.	H
	Construct a viewing platform to maximise views across the valley.	M
	Install formal access paths to deter unauthorised access on the slopes to provide better access to the river.	H
	Revegetate and protect batter slopes to stabilise embankments and deter access.	H
	Install interpretive signage to highlight the botanical significance, biodiversity and heritage value of the area.	H
	Revegetate and restore the canopy cover of the removed Eucalyptus camaldulensis in this area.	H
	Undertake weed control and removal of non-indigenous plants to maintain the woodland character.	H
CP4.3	Restoration Zone 1: North Facing Slopes Adjoining Railway Line	
	Provide for safer access to the reserve from the southern residential area by installing fencing and/or buffer planting.	H
	Restore the open woodland character with Mallee Box woodland plantings of Eucalyptus porosa. Monitor and control the existing population of non indigenous species such as Leptospermum, Melaleuca, and Acacia species. An increase in these species will threaten the significance and existence of the Mallee Box woodland character.	
	Revegetate the Mallee Box Woodland with an understorey planting of Danthonia, Stipa, Themeda, and Enteropogon and other grassland species. Develop grassland herb species such as Vittadinia and other native daisies, Convolvulus, Ptilotus, Arthropodium, Calostemma, Maireana and Atriplex.	
	Continue the removal process of the Olives trees and other woody weeds in the area and address the weed threats in the significant conservation zones by implementing a weed removal program including spot spraying.	
CP4.4	Conservation Zone 3: North Facing Steep Slopes and Cliff	
	Maintain a rigorous Olive tree removal plan to sustain the open woodland character within this precinct created by olive removal.	
	Restore the Mallee Box woodland character with Eucalyptus porosa planting. Planting must be of the required low density to enable an establishment of the grassy understorey.	
	Implement a rabbit control program to reduce the impact of erosion on the slopes.	
CP4.5	Whitelaw Creek Drainage Line	
	Whitelaw Creek is an important linkage for Clonlea. Undertake weed control and revegetate riparian zone with understorey and canopy cover planting.	M
CP4.6	Rabbit Control	
	Implement a rabbit control program to reduce the impact of erosion via the use of rabbit proof fencing for large conservation and or revegetation areas.	H
	Implement plastic sleeves with tree stakes for new tubestock tree planting.	





- LEGEND
-  Views
 -  Shared Use Path
 -  Walking Track
 -  Bridges
 -  Opportunities for Improvement
 -  Existing Rail
 -  Water Courses
 -  Deep Pool
 -  Vegetation Priority Treatment
 -  Erosion Points

CP1 - Clonlea Park

ACTION PLAN – RIVER JUNCTION PRECINCT

The Gawler River Junction area is where the Gawler River, South Para and North Para converge. The River Junction Precinct is centred on the junction of the Gawler, intersection of North Para and South Para directly west of the town centre. It extends from the Murray Street ford and through the river junction itself to the Fourteenth Street bridge. The River Junction Precinct includes the core formal recreation areas within the river corridors, including the swimming centre, netball, tennis croquet and petanque courts, lawn bowls greens, golf course, Gawler Oval (football and cricket), greyhound track and Showgrounds. This precinct also includes passive recreation areas such as Parridla Taikondi (the area more immediately around the junction).

The Precinct contains a number of walking and cycling paths for public usage. It was also previously the home of the Gawler BMX Track; however this facility has been relocated to the Elliot Goodger Memorial Park at Willaston (on Gawler River Road next to the Willaston sporting facilities).

The junction area itself, and the Gawler River immediately downstream of the junction, has a degraded visual experience because it is prone to graffiti and rubbish dumping due to its isolation from the activity areas located north of the South Para River. This is unfortunate, as the confluence of three rivers is generally perceived as spiritually significant. Furthermore, the Gawler river junction area is believed to have been a meeting place and of significant spiritual importance to the Kurna people although there is currently an absence of information of the significance of this prior activity. Two railway lines also converge and pass through this area. The train line to Gawler Central carries locals and some tourists from Adelaide to the northern regions, making the area a significant junction both from the visual (ground river level and elevated railway level) and spiritual perspectives. The Roseworthy line is currently closed but is likely to be re-opened when Roseworthy becomes a major population centre.

The land that is adjacent the South Para and North Para in the River Junction Precinct is predominantly used as sports grounds beginning from the Gawler Oval and west and northerly towards Gawler Caravan Park. The precinct offers an extensive range of sporting facilities which earns it the characteristic of a connecting sports precinct.

The Gawler Oval Railway station provides excellent access to these sporting facilities from both the northern and southern approaches. The main access issue is the lack of connectively between the sports grounds and the people to the south. There is a safety issue concerning a lack of pedestrian access across the rivers to the sports ground and people have been using the railway crossings as a mean of access. The construction of a footbridge adjacent to the railway bridge as part of the Gawler Urban Rivers Project provides a formal, permanent crossing, which will be a major benefit for movement, access and safe, non-vehicular transport.

Weeds infestation and bank erosion are other environmental and management issues associated with this area.



RJ	The River Junction Precinct	
RJ.1.0	HERITAGE AND CULTURAL VALUES	
RJ.1.1	Recognising the Heritage Values of the River Junction	
	The confluence of three rivers is generally perceived as spiritually significant to the Kurna people. The Gawler river junction area was believed to be once a meeting place of the Kurna but there is an absence of any signs or installations depicting the significance of this prior activity.	M
	Two main railway lines also converge and pass through this area carrying locals and tourists from Adelaide to the northern regions, making the area a significant junction both from the visual (ground river level and elevated railway level) and spiritual perspectives.	
	Provide new interpretive signage and artworks illustrating the spiritual significance of the River Junction to the Kurna people. The River Junction provided a focal point for the indigenous Kurna people of the wider Gawler region. The park at the junction is named Parridla Taikondi, which in Kurna language means “rivers coming together” and the park was adopted by Gawler Council as a Reconciliation project in 2003. A significant opportunity for the commemoration of Kurna occupation of the Gawler region and, in particular, the river corridors, exists. This could involve art installations and interpretive signage, and should be undertaken in close consultation with I Kurna representatives to acknowledge cultural sensitivities and to ensure appropriate release of information.	
	The significance of the meeting of the three rivers needs to be articulated through a new landscape that connects and integrate both the historical structure and stories of the River Junction area. Opportunity exists for interpretative signage or artwork to be installed along the paths within this area as part of the interpretive path network.	
RJ.1.2	Heritage Values of Former BMX Track	
	The former BMX track adjacent the Murray Street ford is the site of some original Arbor Day plantings from 1889. It is proposed that part of this location be developed as a natural heritage garden, exhibiting the natural vegetation that was endemic prior to European settlement (this could incorporate a mix of riparian vegetation and a range of plains vegetation, including local threatened communities such as the Mallee Box Eucalyptus porosa woodland and native grasslands) as well as a formal European style garden to complement the remaining Arbor Day plantings. The garden could involve local nurseries to illustrate the utility and beauty of native plantings in a formal garden setting.	
RJ.1.3	Cultural Values – Artwork	
	The opportunity exists to create a ‘Sculpture Walk’, with sculpture and historic artwork placed along the shared use path throughout the river corridors, to enable users of the open space to appreciate of the historical and environmental significance of Gawler’s rivers. The values of the river corridors can be illustrated through the artwork (which could either complement or contrast with existing sculptures) and interpretive signage.	
	The significance of the river confluence (see RJ.1.1) could be interpreted through signage and/ or public art work as part of the proposed Sculpture Walk, illustrating the spiritual importance to Kurna people or reflecting the industrial heritage of the area by echoing the railway bridges which provide a dominant visual feature in the area.	
	Sculptures in other areas within the River Junction Precinct could reflect the strong recreational aspects of the area, such as the concentration of recreational venues on the southern bank of the North Para in this Precinct, including ball sports (bowls, tennis, netball, cricket, football, croquet, and petanque), swimming, greyhound racing, and the Showgrounds.	

RJ.2.0	RECREATIONAL VALUES	
RJ.2.1	Improve the Connection and Integration of Existing Recreational Facilities	
	Establish a distinctive recreational precinct. Connect and integrate using the shared use path network delivered by the Gawler Urban Rivers Project. Include the Gawler Bowling Club (Lawn Bowls), Gawler Croquet Club, Princes Park (Oval, Gawler Sport and Community Centre), Gawler Oval (Greyhound Track, Football Oval, Cricket Pitch and Netball/Tennis Courts), Golf Course.	
RJ.2.2	Recreational Opportunities – Fitness Circuit/ Fitness Node	
	The opportunity exists to encourage increased use of the Precinct through establishment of a Fitness Circuit linked to the new cycling and walking networks. The River Junction Precinct could provide one or a number of Fitness Nodes, with permanent equipment provided to encourage exercise. These could be located near the carpark at Parridla Taikondi, near the Murray Road ford (adjacent to the Burrows Street extension – see RJ.3.12), and near the Gawler Recreation Centre to link with the indoor facilities housed there.	
RJ.2.2	Recreational Opportunities – Aquatic Centre	
	Upgrade or replacement of the Trevor Bellchambers Aquatic Centre could be considered to provide an all-weather, all-year swimming and water sports facility. Combined with the newly completed cycle path network linking the river corridors from north to south, this could provide the basis for establishing a Gawler Triathlon, focussing on the picturesque river corridors.	
RJ.3.0	LANDSCAPE, LAND USE AND AMENITY VALUES	
RJ.3.1	Improve Access, Linkage, Integration and Connection of the River Corridor Parklands	
	Recreation links have been strengthened by the new paths network and safe pedestrian footbridges across the river. Opportunities for further cycling linkages should be investigated; these could include links within the existing Gawler path network (e.g., a link the southern Showgrounds entrance on Nixon Terrace to join with the path at the bowls club at Hallam Drive) and/or other local cycling networks (e.g., the Northern Expressway cycle way and the Barossa Trail)	
	Shared use paths and walking tracks should be extended to link the River Junction Precinct to the Gawler River Precinct and the Northern Expressway cycle path.	
	An additional bridge and linking paths should be provided to link the River Junction Precinct to facilities in the Willaston area, notably the BMX track adjacent the Willaston sports grounds.	
	A new footbridge over the North Para connecting Willaston to Gawler would also provide safer access for cyclists and train commuters using the Gawler Oval and Gawler Central stations.	
RL.3.2	Provide Furniture, Signage, Lighting and other Public Amenities	
	Integrate the site with the rest of the riverine corridors through connecting signage highlighting heritage, recreation and community values.	
	Provide additional seating, lighting and picnic facilities to encourage passive recreation.	
RJ.3.3	Provide Permeable Fencing	
	Integrate the Precinct with the rest of the riverine corridors through connecting signage highlighting conservation, heritage, recreation and community values.	
	Provide additional seating, lighting and picnic facilities to encourage passive recreation.	
RJ.3.4	Flood Control	
	River flats particularly at the immediate location of the three rivers junction provide an ideal location for passive recreation. However, the area is prone to floods especially in the Winter months; this will impact on vegetation and user access through this area to some extent.	
	Consider earth works to protect activity areas and to vulnerable revegetated areas.	

RJ.3.5	Provide Safe River Access	
	River access is desirable and achievable on the South side of the South Para for activities such as use by local Primary School students as a Waterwatch site. The new bridge will aid connections across the river; however, there are no current formal or safe access points to the river channel itself.	
	Provide safe access to the South Para river edge on the southern side via path access and rock beaching.	
RJ.3.6	Provision and Enhancement of Recreational Spaces	
	Some passive recreational spaces exist within this region which could be improved and enhanced to provide better attraction and accessibility.	
	Provide new shelter and picnic/BBQ facilities.	
	Provide bench seating at rest points along the shared use paths. A key opportunity exists to the north of the Bowling Club, overlooking the North Para and the golf course land beyond, which could be developed to provide a picturesque picnic area.	
	Provide lighting for safer access and surveillance for commuters accessing the sports facilities and Primary School in low light.	
	Provide dog waste bag dispenser units along the shared use path.	
	Identify and develop formal recreational spaces that cater for picnic areas, children playground, kick about areas and dog on/off leash areas.	
RJ.3.7	Provide Public Amenities	
	Investigate the feasibility of providing a toilet at the carpark area or near the picnic area at the western end of Lawrence Avenue. Environmentally friendly stand-alone toilets are available.	
RJ.3.8	Develop the River Junction area	
	Opportunity to design and develop area directly adjacent to the three rivers junction as an interpretive space to reflect the significance of the confluence of three rivers at ground and two railways above. The area’s name, Parridla Taikondi, means “coming together” or “rivers coming together”. This is a significant meeting place for the rivers, rail and, historically, for people. Sensitive development of the area can make it so once again.	
	This area has great potentials as major destination point as well as a focus owing to its location which allows for easy access via the shared path system.	
	This area also provides strong visual connection to the elevated land located north of the North Para river. This area, immediately south and downhill of a large area zoned for industrial uses, is degraded, and Council should investigate the possibility of contributing funds to upgrade this area through landscaping.	
	The intent and design of any development of the River Junction area must be done with great sensitivity due to the spiritual significance of the site to the Kaurna people. Ongoing consultation with local Kaurna groups should be conducted to determine if and how any development on the site should be undertaken.	
RJ.3.9	Upgrade carpark at Parridla Taikondi	
	An informal, unsealed carpark is currently located at the western end of Lawrence Avenue which connects to a walking path and a dilapidated interpretive sign. The opportunity exists to improve parking in this area with improved interpretive signage for better direction to the riverine reserves. The opportunity also exists to consider incorporating Water Sensitive Urban Design principles in developing the carpark, including permeable paving or other initiative.	
RJ.3.10	Land Use Options – Golf Course	
	Continue negotiations regarding retention of the golf course land to provide a buffer between the river channel and the adjacent residential and industrial properties to the north. This would provide the opportunity to use the land as a flood management resource, designed to slow the speed of any floodwaters and reducing downstream impacts. This would also provide the opportunity to establish a stormwater treatment resource (e.g., wetlands, which could provide filtration and settlement of stormwater runoff from the up-gradient properties as well as flood waters.	











RJ.3.11	Land Use Options – Adjacent Murray Road	
	Investigate opportunities to establish parklands in the existing orchard and adjacent vacant land between Murray Road and the extension of Burrows St (the existing shared path), north of the river. This land could extend the parklands between the Caravan Park and Clonlea Park, and provide additional access to the river. This would also provide the opportunity to revegetate this area with native grasses and indigenous vegetation, including the threatened community Mallee Box Eucalyptus porosa woodland and native tussock grasslands. The area is large enough to also house a community facility (e.g., environmental education centre) and additional recreation resource (e.g., oval).	
RJ.3.12	Land Use Options – Caravan Park and BMX Park	
	Investigate land use opportunities at the site of the current Caravan Park. This area could complement the establishment of a contiguous parkland corridor which would extend from Main North Road to Clonlea on the south side of the river. The establishment of parkland through the Caravan Park could provide connections to the BMX area and the proposed parkland between Murray Road and the Burrows St extension (see RJ.3.12).	
	Potential uses at the Caravan Park could utilise the existing infrastructure on the site to establish an adventure park, with bicycle tracks, adventure playground and play equipment.	
	The site could also include areas of indigenous planting on the upper slopes and the steep river banks to provide ecological, bank stabilisation and habitat values.	
RJ.4.0	BIODIVERSITY AND ENVIRONMENTAL VALUES	
RJ.4.1	Conservation Planning	
	Considerable conservation efforts have been undertaken in the River Junction area by a number of dedicated community groups with Council support. Conservation areas maintained by different local groups should be identified and information regarding weed control, revegetation and other environment protection works should be consolidated. A consultative process to develop, implement and update a conservation program for the entire Precinct should be established.	
RJ.4.2	Weed Removal and Management	
	Implement a weed removal and management program. Weed infestation is degrading the river banks.	
RJ.4.3	Revegetation	
	Revegetate in accordance to Priority Site No.9. Provide canopy cover to include Eucalyptus camaldulensis (River Red Gums) planting and understorey.	
	Investigate the slow regeneration of the River Red Gums in this area and remediate if possible and appropriate.	
RJ.4.4	Provide and Maintain Habitat values	
	Retain existing hollow trees and logs as habitat environment for local fauna.	
	Future planting in this area should consider the habitat values and/or food source for migrating birds and other fauna.	
RJ.4.5	Stormwater Management and Litter Control	
	An existing 750mm diameter storm water outlet is located in Lawrence avenue near Marsh avenue with possible vehicle access, is an ideal location for the installation of a gross pollutant trap to collect rubbish from stormwater runoff. Delete – one is already installed.	
	Continue negotiations regarding retention of the golf course land to establish a stormwater treatment resource to provide filtration and settlement of stormwater runoff from the up-gradient properties as well as flood waters (see RJ.3.11).	





RJ1 - River Junction

LEGEND

-  Views
-  Shared Use Path
-  Walking Track
-  Bridges
-  Opportunities for Improvement
-  Existing Rail
-  Water Courses
-  Deep Pool
-  Vegetation Priority Treatment
-  Erosion Points

ACTION PLAN - GAWLER RIVER PRECINCT











The Gawler River Precinct covers the area extending from the Roseworthy line rail bridge to the Gawler Bypass Road, which also forms the boundary with the Light Regional Council. This area is mostly privately held land, but there are some areas of Council ownership, and plans to increase the parklands in this Precinct to join to the greater Gawler parklands area. The Gawler River immediately downstream of the Junction has degraded visual significance owing to its lack of attraction and maintenance, and is regularly prone to graffiti and rubbish dumping due to its isolation from the activity areas located north of the South Para.

GR	Gawler River Precinct	
GR.1.0	HERITAGE AND CULTURAL VALUES	
GR.1.1	Recognising the Heritage Values of the area	
	Provide signage to highlight the heritage values of the existing Railway Bridges	
GR.1.2	Cultural Values	
	The Gawler River can be enhanced through interpretive signage and/or public art work as part of the proposed Sculpture Walk.	
GR.2.0	RECREATIONAL VALUES	
GR.2.1	Improve the Connection and Integration of Existing Recreational Facilities	
	Improve and upgrade shared use paths and walking tracks to link to adjacent precincts and parkland, particularly to the main recreational areas around the Essex Park area to the east.	
GR.2.2	Recreational Opportunities	
	Provide path connection to railway stations, carparks and picnic areas.	
	Encourage sustainable practices such as cycling by providing safe and accessible linkages and bike racks.	
	The opportunity exists to encourage increased use of the region through establishment of a Fitness Circuit linked to the new cycling and walking networks.	
GR.3.0	LANDSCAPE, LAND USE AND AMENITY VALUES	
GR.3.1	Improve Access, Linkage, Integration and Connection of the River Corridor Parklands	
	Capitalise on new shared paths and extend to link the shared paths network in the River Junction Precinct with the Northern Expressway and other networks in the region.	
	A new footbridge over the Gawler River should be constructed west of the Roseworthy rail line, providing a link between the northern and southern banks of the Gawler River and a safe way to cross the railway.	
GR.3.2	Provide Furniture, Signage, Lighting and other Public Amenities	
	Install interpretative signage to articulate the history and story of the area	
	Provide additional seating, lighting and picnic facilities to encourage passive recreation.	
GR.3.3	Land Use	
	Investigate purchase of land/properties to extend parklands area and connect to the existing trail networks. Key examples include the riverine areas of Gawler West and Reid between the Roseworthy rail line and the Gawler Bypass.	
GR.4.0	BIODIVERSITY AND ENVIRONMENTAL VALUES	
GR.4.1	Conservation Planning	
	Conservation in the Gawler River Precinct is constrained by ownership of surrounding land, which restricts access to the river. A consultative process, involving community groups, landholders and Council should be established to develop and implement a management program. This would involve consolidation of data, identification of strategic parcels for potential purchase, and negotiation with landholders to preserve areas for conservation adjacent to the river corridors.	





LEGEND

-  Views
-  Shared Use Path
-  Walking Track
-  Bridges
-  Opportunities for Improvement
-  Existing Rail
-  Water Courses
-  Deep Pool
-  Vegetation Priority Treatment
-  Erosion Points

ACTION PLAN - GAWLER CENTRAL PRECINCT

This Precinct is located on the South Para, south west of the town centre, and provides a distinct, picturesque entry into central Gawler. The Precinct includes Apex Park, Goose Island and Duck Flat. Apex Park is a popular park because of its proximity to the business centre of Gawler, and has significant recreational and historic values. Apex Park is identified by the heritage significant row of Moreton Bay Fig trees in Julian Terrace, providing the park with a distinctive botanical character. Apex Park is an important, high amenity venue for the community, providing passive open space areas to house local community events, as well as a venue for picnics and a rest area for shoppers, workers and visitors to the town. The park is also a part of the Gawler Heritage Trail network, containing walking tracks, a playground and public amenities.

The Apex Park area has strong recreational links with the Town of Gawler. The area has a playground, barbeque facilities, public toilets as well as a large grassed area usable for a number of non organised recreational activities. Henry Chenoweth Park is adjacent to the 14th Street ford and provides additional open space for recreation activities as well as some seating. Being adjacent to the footbridge and the Gawler Community House and Elderly Centre provides additional opportunities for community interaction. The Precinct also has a footbridge (adjacent to the statue of James Martin) connecting the Gawler Central Precinct to Goose Island, which allows for links between surrounding areas.

GC	Gawler Central Precinct	
GC1.0	HERITAGE AND CULTURAL VALUES	
GC.1.1	Recognising the Heritage Values of the area	
	Consolidate and upgrade the existing heritage trail linkages, including new interpretive signage (see GC.3.4).	
	The link between the heritage Moreton Bay fig trees and other historic park land plantings in the Precinct, planted with assistance from Dr Schomburgk, and the Adelaide Botanic Gardens could be illustrated by new interpretive signage (see also GC.3.3).	
GC.1.2	Cultural Values	
	The opportunity exists to create a ‘Sculpture Walk’, with sculpture and historic artwork placed along the shared use path throughout the river corridors, to enable users of the open space to appreciate of the historical and environmental significance of Gawler’s rivers. The values of the river corridors can be illustrated through the artwork (which could either complement or contrast with existing sculptures) and interpretive signage.	
	The Gawler Central Precinct is also ideal for the installation of public artworks as part of the proposed Sculpture Walk, which could build on the central theme of ‘machinery’ to reflect Gawler’s railway and mining history of the region. Items historically produced by James Martin’s company (whose statue stands opposite the Goose Island bridge) and other pioneering local businesses at Gawler could make for interesting and interactive public art, including: — Bullock drays — Agricultural implements — Mining machinery — Railway locomotives and rolling-stock — Other ironwork	
GC.2.0	RECREATIONAL VALUES	
GC.2.1	Recreational Opportunities – Fitness Circuit/ Fitness Node	
	The opportunity exists to encourage increased use of the region through establishment of a Fitness Circuit linked to the new cycling and walking networks. The Gawler Central Precinct would be an ideal location to provide a Fitness Node, with permanent equipment provided, as the proximity to the Town Centre would encourage workers in the commercial centre to exercise during their lunch breaks.	
GC.3.0	LANDSCAPE, LAND USE AND AMENITY VALUES	
GC.3.1	Improve Access, Linkage, Integration and Connection of the River Corridor Parklands	
	Capitalise on new shared paths and extend to link to Goose Island across existing bridge	H
	Improve the footbridge connection to the Gawler Central Precinct and Goose Island to improve access and visual amenities.	

GC.3.2	Development of Goose Island	
	Opportunities to investigate Goose Island as an extension of Apex Park to maximise the civic parkland and botanical character enabling more community open space and events area. Goose Island is an ideal location for such a facility given its proximity to the Town Centre and heritage focus in this area of the Gawler Central Precinct.	
	Establish Goose Island as a “Village Green”, with landscaping upgrades and picnic facilities to accommodate events such as markets, arts and craft fairs, concerts.	
	Opportunity to provide a community building on Goose Island to host events function such as community functions, weddings and ceremonies, linking to the nearby churches yards (particularly the old Wesleyan Chapel and Uniting Church). Any structure built in this area would have to take into account the high flooding risk in this area.	
GC.3.3	Landscape Design	
	Provide planting and landscape design to create a botanical garden character environment reflecting the contribution of early settlement in Gawler. Plantings lower down in the river channel should be selected and located with care to avoid losing these plantings during flood events.	
	Retain and protect the existing heritage significant Moreton Bay fig trees, Ficus macrocarpa macrophylla, along Julian Terrace.	
	The botanical garden environment is the recommended character theme for Apex Park. The botanical character theme was set by Dr. Schomburgk in the 1870s with the planting of the Moreton Bay Fig trees along Julian Terrace. These trees should be retained and protected and replaced over time as required.	
	Future development of Apex Park and the parklands along Scheibener Terrace should include additional planting beds of botanical interest to reflect the European settlement in the area and the contribution to the Gawler Township. Exotic planting will provide visual interest to this localised area as well as providing a contrast to the native planting theme existing along the river corridor.	
	Building on the sense of community, the Moreton Bay Fig Trees and the concept of creating a botanical gardens environment, there are also opportunities to formally link Apex Park to adjacent land including Goose Island, the Uniting Church centre and Henry Chenoweth Park to connect and integrate these significant areas. Henry Chenoweth being a long-serving Council head gardener adds to the botanical theme.	
GC.3.3	Land Use	
	Confirm property boundaries along the river channel (by survey if necessary) and record in Council’s GIS system to ensure no boundary creep of private properties further into the river corridors.	H
	Investigate purchase of freehold residential properties (all or at least the parts subject to flooding) to extend the parklands area, particularly at Goose Island and on the south bank of the South Para, parallel to Seventh Street. Steep banks in these areas pose the risk of erosion and collapse; establishment of parkland in these areas will enable remediation of unstable and unconsolidated areas.	
GC.3.4	Provide Furniture, Signage, Lighting and other Public Amenities	
	Apex Park is a destination point for both visitors and the local community and is an ideal central location to meet. The park is currently equipped with public facilities including toilets, picnic tables, benches and signage as part of the passive recreational use. These facilities need to be replaced or updated with an appealing street furniture suite that is consistent with Council’s preferred furniture suit, furniture that is easily maintained, durable, robust and unique to the Town of Gawler.	
	Replace existing where needed and provide additional signage and interpretation points to: — Direct access and circulation; — Identify the linear park path; — Identify Apex Park as stop 23 on the Gawler Heritage Trail; (needs some explanation as it is also a stop on the 8 site walking trail) — Provide background information and the history and heritage values of the site.	

GC.4.0	BIODIVERSITY AND ENVIRONMENTAL VALUES	
GC.4.1	Conservation Planning	
	Considerable conservation efforts have been undertaken in the Gawler Central Precinct area by a number of dedicated community groups with Council support. Conservation areas maintained by different local groups should be identified and information regarding weed control, revegetation and other environment protection works should be consolidated. A consultative process to develop, implement and update a conservation program for the entire Precinct should be established.	
GC.4.1	Wetlands/ Deep Pool Construction	
	Investigate feasibility of the construction of a wetlands area with a deep pool area for ecological and hydrological benefits.	
GC.4.2	Bank Stabilisation	
	The banks of the South Para bordering Apex Park from the foot bridge to Whitelaw Terrace are facing degradation due to erosion and a lack of riparian planting. Some stabilisation works have been undertaken below Whitelaw Terrace as part of the Gawler Urban Rivers Project; however, additional works may be required both upstream and downstream of these locations to reduce erosion potential. Building up the inner bank around Goose island has added to the erosion potential on adjacent banks.	
	Revegetation and stabilisation of the South Para river banks with indigenous plant species is required to improve visual appeal, restoring the health of the river corridor and encouraging biodiversity in the area.	
	Remove silt build-up from riverbed and regrade sections to achieve footpath width	H
	Remove weed species from the riverbank and implement weed management scheme in accordance with existing upstream management (Dead Mans Pass).	
	Investigate opportunities to regrade southern slope to reduce the hazardous fall from the adjacent properties to the water level.	
	Revegetate the banks of the South Para River with indigenous plant species to improve visual appeal as well as stabilising banks and providing connectivity for fauna species along the river corridor.	
	Replant riverbank with appropriate species to improve soil stabilisation and to increase the visual appeal of the river corridor.	
	Install Gross Pollutant Traps and other treatment infrastructure at key stormwater outlets to prevent silt, debris and other pollutants from entering the water system.	
	Install new pipework to replace dangerous and derelict pipes. Trench under footpaths to avoid soil erosion across pedestrian zones.	
	Encourage adjacent properties to install secure fencing.	
GC.4.3	River Channel and Floodplain Works	
	Regrading a section of the southern bank of the river around Goose Island will improve hydraulic flow of the river, reducing the under mining of the northern bank at the corner and increase bank stability in this area.	
	The existing earth mound at the corner should be pushed back towards Goose Island into the existing original bank. Regrading within the 1:100 flood zone will enable this zone to be revegetated with Eucalyptus camaldulensis or other suitable flood-tolerant species.	
	All construction work and earthworks within the river channel and floodplain would require approval to undertake a Water Affecting Activity from the Adelaide and Mount Lofty Ranges Natural Resources Management Board.	
GC.4.4	Remove weed species from the riverbank and implement weed management scheme in accordance with existing upstream management (Dead Mans Pass).	
	In order to maintain the botanical environmental character of this area, landscape designs needs to consider the water requirement of plants species proposed, and to select appropriate species to best reflect the character of the area.	
	In special planting areas, investigate the options of drought tolerant plants yet maintaining botanical interest and variety. Investigate the implementation of xeriscape planting techniques (see GC.3.3).	











	Explore the options of water harvesting of rooftops and storage to enable irrigation of planting and grass areas. Investigate changes to stormwater management to direct water into the root zone of the Moreton Bay Figs and other historic parkland tree plantings.	
GC.5	Installation of Sculptures and Artworks	
	Sculptures and artworks installed in this Precinct could complement the proposed Sculpture Walk concept. Given the proximity to the Town Centre, this Precinct has a high local and tourist traffic volume, and is ideally placed to site landmark sculpture installations, including “talking” sculpture/s representing historical figures or events and reflecting the heritage importance of Gawler’s rivers to both Kurna and European residents.	





GC1 - Gawler Central

LEGEND

-  Views
-  Shared Use Path
-  Walking Track
-  Bridges
-  Opportunities for Improvement
-  Existing Rail
-  Water Courses
-  Deep Pool
-  Vegetation Priority Treatment
-  Erosion Points





ACTION PLAN - DEAD MANS PASS PRECINCT

Dead Mans Pass is located on the South Para, directly south of the town centre at the end of Murray Street and contains strong heritage and passive recreation values. Dead Mans Pass is a regional park in a natural river setting and is easily accessible by the wider public. The natural environment and amenity of the parkland is highly valued for natural open space, native plant character, natural waterholes and flora and fauna habitats.

Dead Mans Pass is commonly used as walking area that is popular with locals, particularly for off the leash dog walking. There are walking/cycling paths available within the area. There are also public toilet facilities and a large car park for users. Dead Mans Pass was also used as part of the cross country track for the annual Gawler Three Day Event. The Gawler Event was Australia’s most prestigious equestrian event until it was relocated to the Adelaide Parklands in 1997.

It is recommended that the section between Dead Mans Pass and the new Gawler East development be given some priority in terms of planning connections.

Pedestrian and cycling linkages are important as part of the establishment of active recreation facilities, given the expected population increase in the south. Pedestrian and cycling linkage will reduce the reliance on motor vehicles and minimise excessive traffic, and also encourage the use of alternate forms of transport to access the other services offered in the in the Gawler Town Centre. Establishing passive recreation facilities in the Dead Mans Pass region of the Study Area will also respond to the dissatisfaction expressed in the last community needs study of the poor quality parks and recreation areas in new residential developments.

The upgrade and expansion of pedestrian and cycling paths in the Dead Mans Pass is part of the Urban Rivers Project which will contribute to the overall development of recreational infrastructure in the reserve areas of Gawler.

Other improvements may include development of picnic facilities and playgrounds to cater for residential development in the area and encourage the use of the parkland.

Given the high biodiversity and associated conservation values in Dead Mans Pass, there is a potential for ongoing conflict between the ecological and recreational values. With the construction of the cycle and walking paths as part of the Gawler Urban Rivers Project, and the advent of the Gawler East development, recreational use of this area is likely to increase and, unless appropriate management regimes are in place, the conservation values of the precinct could be negatively affected. Areas of higher conservation value need to be protected from high levels of usage, noise, dogs (on- or off-leash) and fast moving cyclists. While some fauna species can cope with such impacts, many shy species are unable to do so, and will avoid or move out of the area because of such disturbances. A high priority needs to be given to the assessment of such issues and the potential development of appropriate education, signage and by-laws to minimise the impacts to fauna in this area.

DP	Dead Mans Pass Precinct	
DM1.0	HERITAGE AND CULTURAL VALUES	
DM.1.1	Recognise the Indigenous Heritage Values of the area	
	Reflection of the indigenous heritage value of Dead Mans Pass could be provided through the interpretation of Kaurna inhabitation of the area, including food, crafts and culture, conflicts and cooperation between various local Indigenous groups, and between the Kaurna and the European settlers.	
DM.1.2	Recognise the European Heritage Values of the area	
	Interpretation of Colonel William Lights association with the area, and those settlers who followed Lights path to the Barossa, including the camp site for Colonel William Light from which he based himself to survey Gawler and the Barossa region and conceived the birth of South Australia’s first country town.	
	The area has a significant link to the Colonel Light’s vision of the Country Town and its growth with correlation that can be made to the Heritage Places located within the precinct.	
	Consolidate and upgrade the existing heritage activities by providing additional linkages with consistent signage. Interpretive signage about registered heritage places, as well as the history of the horse jumps from the Gawler 3-Day Event, should be considered.	
	There is justification for this part of the Gawler Parklands to be registered under State Heritage provisions, given its importance to understanding the life and work of Colonel Light.	











DM.1.3	Cultural Values	
	The opportunity exists to create a ‘Sculpture Walk’, with sculpture and historic artwork placed along the shared use path throughout the river corridors, to enable users of the open space to appreciate of the historical and environmental significance of Gawler’s rivers. The values of the river corridors can be illustrated through the artwork (which could either complement or contrast with existing sculptures) and interpretive signage.	
	Artwork in the Dead Mans Pass Precinct could reflect the significance to the local Kaurna people (see DM.1.1) and Colonel Light (see DM.1.2), including a reference to the “Dead Man” in the site’s name. Artwork could also reflect the more recent use of the area, including fishing and swimming in the waterholes both in Dead Mans Pass and upstream that used to occur in the wetter months of the year before the construction of the South Para Reservoir.	
	Artwork could also reflect the high ecological value of the area, reflecting the aquatic and terrestrial environments, and illustrating both the floral and faunal biodiversity.	
DM.2.0	RECREATIONAL VALUES	
DM.2.1	Improve the Connection and Integration of Existing Recreational Facilities	
	Complement the cycling and walking networks by extending these into the open space areas proposed for the Gawler East development. Council should consider requiring the developers to link open space areas in the Gawler East site, particularly those with high visual amenity or conservation value, to the river corridor within the Dead Mans Pass Precinct and also deal with issues of management of the river corridor and Open Space Zone upstream of Dead Mans Pass reserve.	
DM.2.2	Recreational Opportunities – Fitness Circuit/ Fitness Node	
	Identify the recreational (passive and active) and conservation precincts within the reserve and develop these activity zones and protect areas reserved for conservation and revegetation purposes.	
	The Dead Mans Pass area would provide an excellent location for a Fitness Node, providing permanent exercise equipment to encourage physical activity and exercise within Gawler’s river corridors.	
DM.2.3	Off-Leash Dog Walking Area	
	As identified earlier, the area is currently popular as an off the leash dog walking area; however, the Dead Mans Pass Precinct also has high fauna and flora biodiversity, which is not compatible with higher impact recreational use. An enclosed or dedicated area could be constructed in the Dead Mans Pass areas designated for off-leash use, and limitations placed on on-lease use thus allowing areas for active use but separated from conservation areas.	
DM.3.0	LANDSCAPE, LAND USE AND AMENITY VALUES	
DM.3.1	Improve Access, Linkage, Integration and Connection of the River Corridor Parklands	
	Complement the existing cycling and walking path network constructed as part of the Gawler Urban Rivers Project, including consideration of extending these networks into the Gawler East development area.	
DM.3.2	Provide Furniture, Signage, Lighting and other Public Amenities	
	Opportunities exist to develop picnic and BBQ facilities within the parkland and the residential properties on the north side. Picnic and BBQ venues will encourage more passive recreational activities within the reserve.	
	Ensure all structures including shelters and toilets are complementary to the natural character of the parkland and minimise visual impacts.	
	Installation of furniture including park benches, fencing, bins, drink fountains and dog waste bag dispensers units along the shared use paths.	

DM.3.3	Review Road Crossing at Gawler Terrace/ First Street Intersection	
	The shared use path crosses First Street at Gawler Terrace, and a review of road geometry and road safety at this location is required to improve pedestrian/cycle safety; e.g., widening the road and installing a central median refuge. Same comment added for Clonlea Murray Road crossing?	H
DM.4.0	BIODIVERSITY AND ENVIRONMENTAL VALUES	
DM.4.1	Conservation Planning	
	Considerable conservation efforts have been undertaken in the Dead Mans Pass Precinct by a dedicated community groups with Council support. Conservation areas maintained by different local groups should be identified and information regarding weed control, revegetation and other environment protection works should be consolidated. A consultative process to develop, implement and update a conservation program for the entire Precinct should be established. Further assessment of fauna diversity and community behaviours should be undertaken on a regular basis in this precinct to identify the conservation and recreational requirements for the area. If necessary, conservation areas could be set aside, educational programs developed and appropriate by-enacted to balance the recreational needs of the community with the ecological requirements of the fauna resident in the area.	
DM.4.2	Weed Removal and Management	
	Address the weed threats, especially in the significant conservation zones and implement a weed removal and revegetation program in accordance to Priority Sites 1,2,3,4, 5 and 6. Refer also to the Vegetation Priority Sites for location of problem areas.	H
	Ongoing Olive tree removal is required for Priority Sites 1 and 3; the open Mallee Box and grassland associations should be restored in these areas.	H
	Management plan required for the highly invasive non woody weeds including Wild Oats, Phalaris and Salvation Jane that is of major threat to grassland areas.	H
	Thin out or remove areas of non-indigenous planting at Priority Site 5 to allow natives species to spread.	H
	Removal of woody weeds including Olives, Boxthorn, Palms, Tree Tobacco and other weed species within the drainage line and river banks.	M
	Manage and control kikuyu infestation along drainage lines with approved herbicide ensuring any chemical use is safe for waterways.	
	Integrate a weed management plan with adjoining private land holders.	M
DM.4.3	Revegetation Plan	
	Maintain and protect high quality grassland at Priority Site 1 to ensure future construction of shared use paths have minimal impact on this area.	H
	Re-establish the Mallee Box canopy at low density to Priority Site 1 to reflect the pre-European open grassy woodland.	H
	Regenerate Mallee Box region at Priority Site 6 through the control of grass woody weed control.	H

DM.4.4	Erosion Control	
	Monitor and remediate point source of erosion.	H
	Fix jute mat or similar to eroding slope and replant with tubestock with plastic sleeves and stakes.	
DM.4.5	Vermin Control	
	Implement rabbit control program and protect revegetated areas from rabbit grazing particularly in the southern section of the reserve.	
	Implement other feral animal controls including cats and foxes. Liaise with the NRM Board about the monitoring and control mechanism.	H
DM.4.6	Deep Pool	
	Opportunity to restore a permanent deep pool with viewing deck at the current horse jump site ('The Break' waterhole).	H
	This would establish an area of open water, which could provide flood mitigation benefits as well as ecological benefits, for aquatic and terrestrial flora and fauna.	
	This requires consultation with State Government agencies such as the Environment Protection Authority, Native Vegetation Council and Adelaide and Mount Lofty Ranges Natural Resources Management Board. Approvals have been obtained in 2011 for this work to proceed.	





- LEGEND**
-  Views
 -  Shared Use Path
 -  Walking Track
 -  Bridges
 -  Opportunities for Improvement
 -  Existing Rail
 -  Water Courses
 -  Deep Pool
 -  Vegetation Priority Treatment
 -  Erosion Points

DM1 - Dead Mans Pass

Section 10 - References

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Section 11 - Appendices

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Appendix 1 - Zoning Requirements (Gawler Development Plan 2011)

Appendix 2 - EPBC Search Tool Results

Appendix 3 - Mapped NVIS Vegetation Groups

Appendix 4 - Native Flora Species List

Appendix 5 - Weed Species List

Appendix 6 - Bird Species List

Appendix 7 - Frog Species List

Appendix 8 - Additional Fauna Species

Appendix 1 – Zoning Requirements (Gawler Development Plan 2011)

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SPECIAL USES ZONE

Introduction

In addition to the Council Wide policies, the Special Uses Zone, Special Uses Historic (Conservation) Policy Area and Special Uses Caravan and Tourist Park Precinct and Gawler River Flood Plain Policy Area policies apply to the area shown in:

Special Uses Zone: [Map Ga/3, 5, 8, 9, 12](#)
 Special Uses Historic (Conservation) Policy Area: [Map Ga/15, 20](#)
 Special Uses Caravan and Tourist Park Precinct: [Map Ga/21](#)
 Gawler Rivers Flood Plain Policy Area: [Maps Ga/14, 15, 20](#)
 Gawler Health Services Helipad: [Figure Hel/1](#)

Desired Character

The zone comprises a range of identifiable land use precincts including cultural activities, passive recreation, active recreation, spectator sports, tourist uses, and natural or conservation areas, essentially along parts of the North and South Para Rivers.

The prime purpose of the zone is to provide for community use and business use is generally not envisaged.

In addition to accommodating community activities and uses, the zone has a significant amenity function by providing a distinctive setting for urban development and an opportunity for either tall mature trees, such as occurs along the urban river system, or long vistas over open and green spaces.

Desired Uses:

Active Outdoor Recreation	Intensive Outdoor Recreation (of playing fields, hardcourts)
Agriculture	Landscaping
Car parking	Licensed Premise
Caravan Park	Meeting Room
Community Centre	Oval
Community Hall	Playground
Conservation Area	Stadium
Education	Spectator Stand
Golf Course	Swimming Pool
Hard Surface Court	Recreation Area
Indoor Recreation Facility	

OBJECTIVE

Objective 1: A zone accommodating public and private development of an institutional or open character.

PRINCIPLES OF DEVELOPMENT CONTROL

Form of Development

- 1 Development consistent with the Desired Character for the zone.
- 2 Development undertaken in the Special Uses Zone should be public and private development of an institutional or open character.

Signs

- 3 All signs should be developed in accordance with the relevant provisions applying throughout the Council area and with Performance Standards in [Table Ga/5](#).

- 4 The following sign types, advertising and advertising displays are appropriate in the zone:

- (a) Pylon or Freestanding;
- (b) Flat Wall;
- (c) Sandwich Board;
- (d) First Party Advertising;
- (e) Projecting;
- (f) Under Verandah; and
- (g) Shop Front.

- 5 The following sign types, advertising and advertising displays are inappropriate in the zone:

- (a) Roof;
- (b) Bunting;
- (c) Internally illuminated signs on buildings of heritage significance listed in [Table Ga/3](#) or [Table Ga/6](#);
- (d) Third Party Advertising; and
- (e) Mobile.

PROCEDURAL MATTERS

Non-complying Development

- 6 The following kinds of development including expansion of an existing use are **non-complying** in the Special Uses Zone:

Abattoir
 Amusement Hall
 Auction Room
 Bank
 Billiard Saloon
 Bowling Alley
 Buildings or structures in the Gawler Rivers Flood Plain Policy Area as shown on [Figure GRFP/1](#) and [Maps Ga/13, 14 and 16](#), except where they are elevated to meet the design requirements specified in the Gawler Rivers Flood Plain Policy Area
 Bunting
 Bus Depot
 Bus Station
 Concert Hall
 Consulting Room
 Dance Hall

Demolition:

- (a) in total; or
- (b) of the frontage or side wall returns visible from a street or other elements visible from a public place of a place listed in [Table Ga/3](#) or [Table Ga/6](#).

Detached Dwelling
 Exhibition Hall
 Fire Station

General Industry
 Group Dwelling
 Gymnasium
 Harbour Installation
 Landfill that constitutes solid waste disposal required to be licensed as a waste depot under the Environment Protection Act 1993
 Light Industry
 Mobile Signs
 Motor Repair Station
 Motor Showroom
 Multiple Dwelling
 Office
 Office and Dwelling
 Petrol Filling Station
 Post Office
 Radio or TV Studio
 Refuse Destructor
 Residential Flat Building
 Road Transport Terminal
 Roof Signs
 Row Dwelling
 Semi-detached Dwelling
 Shop or group of shops with a gross leasable area greater than 450 square metres
 Service Industry
 Shop
 Shop and Dwelling
 Skating Rink
 Special Industry
 Squash Court
 Store
 Theatre
 Third Party Advertising
 Timber Yard
 Used Car Lot
 Warehouse

- 7 Further, the following kinds of development are **non-complying** in the Special Uses Zone Caravan and Tourist Park Precinct:

Amusement Machine Centre
 Bus Depot
 Cemetery
 Commercial Forestry
 Community Centre, except where in association with and ancillary to tourist accommodation
 Consulting Room
 Crematorium
 Dairy
 Dam
 Dwelling (except for a manager's residence in association with and ancillary to tourist accommodation)
 Educational Establishment
 Farming
 Fuel Depot
 Horse Keeping
 Horticulture
 Hospital
 Hotel
 Indoor Recreation Centre, except where in association with and ancillary to tourist accommodation
 Industry
 Intensive Animal Keeping

Land Division which results in the creation of an additional allotment(s) either wholly or partly within the Zone, except where a lease or license agreement is made, granted or accepted under the Residential Parks Act 2007

Marina
 Motor Repair Station
 Nursing Home
 Office, except where in association with and ancillary to tourist accommodation
 Petrol Filling Station
 Place of Worship
 Pre-school
 Prescribed mining operations
 Public Service Depot
 Residential Flat Building

Restaurant, except where it is both:

- (a) less than 150 square metres in gross floor area
- (b) in association with and ancillary to tourist accommodation.

Road Transport Terminal
 Service Trade Premises

Shop, except where it is both:

- (a) less than 150 square metres in gross floor area
- (b) in association with and ancillary to tourist accommodation

Stadium
 Stock Sales Yard
 Stock Slaughter Works
 Store
 Warehouse
 Waste reception, storage, treatment or disposal
 Wrecking Yard

Public Notification

- 8 The following kinds of development are assigned as **Category 1 Development** in the Special Uses Caravan and Tourist Park Precinct:

Amenity block, including shower, toilet, laundry and kitchen facilities
 Cabin
 Camping ground
 Caravan park
 Caravan permanently fixed to land
 Recreation area
 Swimming pool
 Tourist park

Special Uses Zone Historic (Conservation) Policy Area

Historic Character and Significance

The Historic (Conservation) Policy Area encompasses the town's rivers and parklands adjoining the original streets and allotments of the town of Gawler, as designed and laid out by Light, Finniss and Co in 1839 and is of historic significance as it still clearly illustrates the planning principles of the day and also the initial footprint of the town.

Gawler's plan is historically significant as a successful example of a grid layout plan adapted to the topography and natural features of the location. The street pattern reflects the form of the rivers and topography of the hill upon which it is established. The original street pattern, rivers and local hills are still clearly identifiable, with features of note including the public squares around the churches and the terraces and parklands bordering the rivers.

OBJECTIVES

- Objective 1:** Retention and/or reinstatement of the street layout and subdivision pattern as designed by Light, Finnis & Co.
- Objective 2:** Development complementary to the historic character and significance of the Special Uses Zone Historic (Conservation) Policy Area.
- Objective 3:** Retention of all places and items (including landscape elements) which contribute to the historic character of the Special Uses Zone Historic (Conservation) Policy Area.
- Objective 4:** Conservation and enhancement of the historic character of the Historic (Conservation) Policy Area, through consideration of:
- (a) Streetscape character;
 - (b) Subdivision pattern;
 - (c) Building set-backs;
 - (d) Building form and materials;
 - (e) Site layout, landscaping and fencing.
- Objective 5:** Maintenance of the existing topography.
- Objective 6:** Retention of historic townscape vistas and views.

PRINCIPLES OF DEVELOPMENT CONTROL

- 1 Development should reinforce and complement the historic character and significance of the area and the integrity of any places and items identified in [Table Ga/3](#).
- 2 Vacant land, buildings or sites having a detrimental affect on the character of the locality should be redeveloped and upgraded in accordance with the historic character of the Special Uses Zone Historic (Conservation) Policy Area, and where applicable, following the guidelines in [Table Ga/4](#).
- 3 Development should conserve, maintain, enhance and reinforce the existing streetscape character of the Zone and Special Uses Zone Historic (Conservation) Policy Area and the historic character of individual buildings, items, structures, and places.
- 4 Development should enhance and contribute to the visual cohesiveness of the Area and any new buildings should be of complementary height, scale, set-back, form and external appearance, and display creative and diverse examples of high standard contemporary architecture.
- 5 Places and items identified in [Table Ga/3](#), [Table Ga/6](#) or [Table Ga/7](#) should not be demolished, but instead be retained, upgraded and adapted such that:
 - (a) the quality or condition which gives the place its significance is protected or enhanced. This should include elements of the place which have significant cultural associations;
 - (b) the place is put to a use which supports the maintenance and restoration of that building, item, structure or place;
 - (c) the place is only altered so as to retain or restore the original external form, materials, and colours in a manner compatible with its structural visual, material and historic integrity;

- (d) where internal arrangements and finishes are of significance to places identified in [Tables Ga/3](#) the place should only be altered in a manner compatible with its structural visual, material and historic integrity.
 - (e) advertisements or advertising displays, which reflect and complement the character and geometry of the building it is attached to.
- 6 Demolition of a place or item identified in [Table Ga/3](#), [Table Ga/6](#) or [Table Ga/7](#) should not be undertaken unless the building, item, structure or place is so structurally unsound it represents a risk to public safety and is beyond economic repair. Unsympathetic (later) additions may be demolished if the later addition does not contribute to the historic character of the place.
 - 7 Development abutting or in close proximity to a place or item identified in [Table Ga/3](#), [Table Ga/6](#) or [Table Ga/7](#) should:
 - (a) respect the historic character of the area and the integrity of the particular item of significance and be designed to a high architectural standard; and
 - (b) be compatible in respect of its design, siting, scale, building and roof shape, bulk, height, materials and colours, fences and landscaping and any advertising signs and external illumination.
 - 8 Any alteration or addition to a place or item identified in [Table Ga/3](#), [Table Ga/6](#) or [Table Ga/7](#) should reinforce and complement the historic character of the place in terms of its design, siting, boundary set-backs, scale, built form and roof shape, bulk, height, materials and external finishes and where applicable:
 - (a) additions should minimise their impact on the streetscape by siting to the rear or the side of existing buildings and not forward of existing buildings;
 - (b) the height of eaves and gutters on additions should be complementary with the existing building;
 - (c) the proportions (vertical and horizontal) of additions visible from the street, should be complementary with those of the existing building;
 - (d) materials may include masonry (stone and brick) render, timber boarding and corrugated steel sheeting (walls and roof);
 - (e) materials such as mirror glass, flat profile steel sheeting, unpainted zincalume sheeting, wide fibre cement sheet planking and polished face concrete panels should not be used where they are visible from the street;
 - (f) roof conversions or additional upper floors are not desirable where they compromise the historic integrity of the building or the view of the building from the street;
 - (g) roof conversions are acceptable where the alterations are fully incorporated under the existing roof and dormer style windows are acceptable where they are not visible from the street; and
 - (h) external colour schemes should be contemporary, but should not dramatically contrast with the original colour scheme of the existing place.
 - 9 Landscaping which should include fencing at the street boundary should be designed to complement and reinforce the historic character of places and items identified in [Table Ga/3](#), [Table Ga/6](#) or [Table Ga/7](#) and the zone generally.
 - 10 The design of new fences, or alterations to existing fences associated with places or items identified in [Table Ga/3](#), [Table Ga/6](#) or [Table Ga/7](#) should complement and reinforce the historic character of the place as follows:

- (a) front fences should complement historic adjacent fences in height, be timber picket, metal palisade, woven wire mesh between timber posts, hedges or rendered masonry with brick copings or other traditional materials (high brush or corrugated steel fences are not desired);
 - (b) side and rear fences should be timber picket or board, corrugated steel sheeting (natural galvanised or painted finish), hedges or rendered masonry with brick copings or other traditional materials;
 - (c) side fences should match the front fence in height for the depth of the front yard.
- 11 Division of an allotment containing a place or item identified in [Table Ga/3](#), [Table Ga/6](#) or [Table Ga/7](#) should not be undertaken if it may detrimentally affect its heritage significance.
- 12 Allotments created by the division of land should result in an allotment which reinforces the integrity of and complements the historic character.

Special Uses Zone Caravan and Tourist Park Precinct

The objectives and principles that apply to the Special Uses Zone Caravan and Tourist Park Precinct are additional to those expressed for the whole of the Council area and for the Special Uses Zone and Special Uses Zone Historic (Conservation) Policy Area and take precedence where a conflict occurs between the precinct, policy area and zone provisions.

The following maps apply: [Precinct Map Ga/21](#).

OBJECTIVES

- Objective 1** A precinct primarily for short-term tourist accommodation and associated facilities.
- Objective 2** A precinct accommodating a range of short-term tourist accommodation predominantly in the form of caravan and camping sites, cabins, and transportable dwellings surrounded by open landscaped areas.
- Objective 3** Development that is designed to enhance the natural features of the local environment, including visual amenity, landforms, fauna and flora.
- Objective 4** Development that contributes to the desired character of the precinct.

DESIRED CHARACTER

This precinct primarily accommodates a range of tourist accommodation uses, including camping sites, caravans and cabins. Dwellings and long-term accommodation will not lead to the displacement of existing tourist accommodation in high demand locations.

Buildings will be a maximum height of two storeys and blend in with the natural environment. In rural and natural landscapes, the visual impact of the park will be minimal from scenic vantage points, public lookouts and tourist routes. Vegetation buffers and landscaping will be important in integrating the park into the landscape and providing screening from surrounding land uses, as well as reducing visual and noise impacts and providing privacy for park users.

Circulation and movement within the park will be pedestrian friendly and promote low speed vehicle movement.

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

- 1 The following forms of development are envisaged in the precinct:

Amenity block, including shower, toilet, laundry and kitchen facilities
Cabin
Camping ground
Caravan park
Caravan permanently fixed to land
Recreation area including tennis court, basketball court, playground
Swimming pool/spa
Tourist park and other forms of tourist accommodation

Form and Character

- 2 Development should not be undertaken unless it is consistent with the desired character for the precinct.
- 3 Permanent buildings should be limited to a dwelling (manager's house), shop (in association with and ancillary to a caravan and tourist park), community or recreational facility and toilets/amenities.
- 4 Recreation facilities should be provided of a scale that is suitable to maintain the open natural character of the area and ancillary to the primary role and function of the park.
- 5 The total number of tourist accommodation sites in the park should be at least 60% of the total number of sites available.
- 6 Landscaping should form an integral part of the design and be used to define spaces, reinforce internal networks, screen utility areas and enhance the visual amenity of the area.
- 7 Every caravan, cabin and dwelling site should be greater than 81 square metres in area.

Car Parking and Access

- 8 Every caravan, cabin or dwelling site should have parking for at least one vehicle, either located on the site or grouped within the park.

Street and Boundary Setbacks

- 9 Every dwelling, annex, caravan fixed to land, recreational facility or amenities building should be set back a minimum of:
- (a) 1 metre from an internal road (and the internal road surfaces should be surfaced to prevent dust becoming a nuisance)
 - (b) 6 metres from a public road
 - (c) 2 metres from the boundary of the caravan park or camping ground.

Natural Hazards

- 10 In areas prone to flooding, bushfire or other natural hazards, buildings and structures (including annexes attached to caravans or caravans fixed to land) should be designed and constructed so that they can be removed in the event of a hazard.

Land Division

- 11 No additional allotment(s) should be created wholly or partly within the precinct except where a lease or license agreement is made, granted or accepted under the Residential Parks Act 2007.

RURAL LIVING ZONE

Introduction

In addition to the Council Wide policies (including the Gawler River Floodplain Policy Area), the Rural Living Zone policies apply to the areas shown in:

Rural Living Zone: [Maps Ga/4, 5, 9, 12](#)

Gawler Rivers Floodplain Policy Area: [Figure GRFP/1](#) and [Map Ga/14](#)

OBJECTIVE

- Objective 1:** A zone primarily accommodating detached dwellings on large allotments set in a semi-rural environment, with a range of agricultural activities, including small hobby farms and some non-agricultural activities, in suitable areas.

PRINCIPLES OF DEVELOPMENT CONTROL

- 1 Development undertaken in the Rural Living Zone should be, primarily, detached dwellings on large allotments set in a semi-rural environment and incorporating a range of agricultural activities including small hobby farms, but some non-agricultural activities that do no conflict with the objective of the zone may be suitable in certain parts of the zone.
- 2 The minimum allotment size should be 4 hectares and the frontage of an allotment to a public road should not be less than 33 $\frac{1}{3}$ percent of the average depth of that allotment.

PROCEDURAL MATTERS

- 3 The following kinds of development including expansion of an existing use are **non-complying** in the Rural Living Zone:

Abattoir

Advertising - Advertisements which are located within 500 metres of the centreline of any primary, arterial or secondary road, tourist road or scenic road, with the exception of advertisements within an 80 km/hr or less speed rated road

Amusement Hall

Amusement Park

Auction Room

Billiard Saloon

Boarding House

Bowling Alley

Builder's Yard

Bus Depot

Bus Station

Community Centre

Concert Hall

Dance Hall

Defence Establishment

Demolition:

(a) in total; or

(b) of the frontage or side wall returns visible from a street or other elements visible from a public place of a place listed in [Table Ga/3](#) or [Table Ga/6](#).

Dog Track

Drive-in Theatre

Educational Establishment

Electricity Generating Station

Exhibition Hall

Fire Station

Fun Fair

Gas Holder

General Industry

Golf Course

Golf Driving Range

Gymnasium

Health Centre

Hospital

Hotel

Landfill that constitutes solid waste disposal required to be licensed as a waste depot under the Environment Protection Act 1993

Library

Light Industry

Marshalling Yard

Major Public Service Depot

Meeting Hall

Motel

Motor Race Track

Motor Repair Station

Motor Showroom

Multiple Dwelling

Non-residential Club

Office

Office and Dwelling

Police Station

Post Office

Petrol Filling Station

Place of Worship

Primary School

Private Hotel

Racecourse

Radio or TV Studio

Residential Club

Residential Flat Building

Road Transport Terminal

Row Dwelling

Semi-detached Dwelling

Service Industry

Shop

Shop and Dwelling

Shop or group of shops with a gross leasable area greater than 450 square metres

Show Ground

Skating Rink

Squash Court

Stadium

Store

Theatre

Timber Yard

Used Car Lot

Warehouse

Welfare Institution

In addition, within the Gawler Rivers Flood Plain Policy Area, as shown on [Figure GRFP/1](#) and [Map Ga/14](#), the following kinds of development are non-complying:

Dwelling except where the dwelling is set-back a minimum distance of 100 metres from the banks of the Gawler Rivers and:

- (a) the dwelling is elevated to meet the requirements specified in the Gawler Rivers Flood Plain Policy Area; or
- (b) the finished floor level of is a minimum of 300mm above the Australian Height Datum (AHD) for the 1:100 year average recurrence interval (ARI) flood level as shown on [Figure GRFP/1](#) and [Map Ga/14](#)

OPEN SPACE ZONE

Introduction

The Objectives and Principles of Development Control that follow apply in the Open Space Zone shown on Gawler [Map Ga/5, 6, 9, 12 and 22](#). They are additional to those expressed for the whole of the Council area.

OBJECTIVES

Objective 1: A zone:

- (a) in which the open space character is preserved to provide a visual contrast to the surrounding urban area
- (b) comprising open space that accommodates a range of public and private activities in an open and natural setting, including:
 - (i) passive and active recreation land uses;
 - (ii) habitat conservation and restoration.

Objective 2: Private land within the Metropolitan Open Space System (MOSS) contributing to regional open space networks and providing an open, natural and rural character accommodating low-scale uses such as non-intensive agriculture.

Objective 3: Public land within the MOSS that provides for recreation areas and facilities, sporting facilities and conservation of the open, natural character.

Objective 4: A linear park that:

- (a) provides an open space corridor across Regional South Australia;
- (b) promotes the use, awareness and preservation of the riverine environment and enhancement of natural or semi natural habitats for the movement of wildlife and conservation of biodiversity.

Objective 5: A river system which provides for the maintenance of stormwater capacity and flood mitigation measures for adjoining areas.

Objective 6: Development that contributes to the desired character of the zone.

DESIRED CHARACTER

The Open Space Zone recognises the special qualities of the South Para River and environs, and it is intended that the zone will manage the river and its interface.

The zone already has natural character and function based on the existing South Para River, topographically steep contours, floodplains and remnant vegetation. This character and function will be maintained and enhanced through appropriate revegetation.

Areas within the zone contain significant flora and fauna, wetlands and permanent waterholes and river corridors and adjoin grassy woodland habitats.

The aesthetic and natural landscape, together with biodiversity value of the zone will be maintained and enhanced in a manner which encourages appropriate human enjoyment and interaction. Whilst the primary intent of the zone is to enhance the natural character of the area, carefully managed development which has a demonstrated benefit to the community is envisaged.

Facilities will include but are not limited to walking and cycling trails, interpretative and recreational activities, formalised open space and car parking. It is envisaged that roads will be developed in the zone to enable movement between areas – refer [Map Ga/1 \(Overlay 1\) Enlargement G](#).

A high pressure gas transmission pipeline traverses the zone as shown on [Map Ga/1 \(Overlay 1\) Enlargement G](#). It is required that development within the zone comply with *AS2885 (Pipeline Gas and Liquid Petroleum)* to ensure minimum pipeline safety requirements have been met.

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

1 The following forms of development are envisaged in the zone:

Conservation work
Farming
Outbuilding associated with open space maintenance
Lighting
Playground
Recreation area
Sporting club facility
Structure associated with a public facility such as car parking, picnic / barbeque area, shelter and toilet
Toilet block and barbeque facility.

2 Development listed as non-complying is generally inappropriate.

3 Publicly owned land within the MOSS should be used for any of the following:

- (a) to provide natural or landscaped open space using locally indigenous plant species;
- (b) to accommodate a range of public recreation, sporting and institutional facilities and uses;
- (c) to accommodate stormwater retention and management;
- (d) to conserve and restore areas of remnant native vegetation and wildlife habitats and corridors;
- (e) to conserve sites of scientific, cultural or heritage interest;
- (f) for revegetation purposes using locally indigenous plant species;
- (g) to provide a buffer to adjoining areas of conservation significance.

4 Privately owned land within the MOSS should be used for any of the following:

- (a) rural activities and agriculture (but not intensive animal keeping);
- (b) low-impact sporting facilities;
- (c) conservation purposes.

5 Development should allow for unstructured passive and active recreation.

Form and Character

6 Development should not be undertaken unless it is consistent with the desired character for the zone.

7 Development should only occur where it is integral to the aesthetic, drainage or recreation function of the zone.

8 Buildings should be:

- (a) restricted in size and number;

- (b) sited so as not to detract from the open natural character of the policy area;
- (c) constructed of materials which blend with the riverine landscape.

- 9** Development should ensure coordinated design with an emphasis on the creation of pedestrian areas.
- 10** Landscaped buffers should be provided around the perimeter of recreation or sporting facilities.
- 11** Landscaping should comprise locally indigenous species and incorporate existing remnant vegetation.
- 12** Development should ensure that public access to the Linear Park is retained and enhanced for cyclists and pedestrians.
- 13** Development, landscaping, and paths for pedestrians and cyclists should:
- (a) take into account the changing flow regime and width of waterways; and
 - (b) be constructed of permeable material where practical to reduce stormwater runoff.

Land Division

- 14** Land division should not be undertaken except where
- (a) it will facilitate the development of an envisaged use in the zone or policy area;
 - (b) it will facilitate the development of an envisaged road in the zone or policy area; or
 - (c) no additional allotments are created.

PROCEDURAL MATTERS

Complying Development

- 15** Complying developments are prescribed in Schedule 4 of the *Development Regulations 2008*.

Non-complying Development

- 16** Development (including building work, a change in the use of land, or division of an allotment) for the following is **non-complying**:

Advertisement and /or advertising hoarding
 Amusement Machine Centre
 Consulting Room
 Crematorium
 Dairy
 Dwelling
 Educational Establishment
 Fuel Depot
 Horticulture
 Hospital
 Hotel
 Industry
 Intensive Animal Keeping
 Motel
 Motor Repair Station
 Nursing Home
 Office except in association with recreation facilities
 Petrol Filling Station
 Place of Worship
 Pre-school

Prescribed Mining Operations
 Public Service Depot
 Residential Flat Building
 Restaurant
 Road Transport Terminal
 Service Trade Premises
 Shop of group of shops except where the gross leasable area is less than 80 square metres
 Stock Sales Yard
 Stock Slaughter Works
 Store
 Tourist Accommodation
 Warehouse
 Waste reception, storage, treatment or disposal
 Wrecking Yard

Public Notification

- 17** Categories of public notification are prescribed in Schedule 9 of the *Development Regulations 2008*.

Appendix 2 – EPBC Search Tool Results



Protected Matters Search Tool

You are here: [Environment Home](#) > [EPBC Act](#) > [Search](#)

26 November 2009 15:17

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the [caveat](#) at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at <http://www.environment.gov.au/atlas> may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

Search Type: Point
Buffer: 3 km
Coordinates: -34.6008,138.7381



- Report Contents:** [Summary](#)
[Details](#)
- [Matters of NES](#)
 - [Other matters protected by the EPBC Act](#)
 - [Extra Information](#)
- [Caveat](#)
[Acknowledgments](#)



This map may contain data which are
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Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance: (Ramsar Sites)	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	1

Threatened Species:	5
Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>.

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov.au/epbc/permits/index.html>.

Commonwealth Lands:	3
Commonwealth Heritage Places:	None
Places on the RNE:	63
Listed Marine Species:	7
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Other Commonwealth Reserves:	None
Regional Forest Agreements:	None

Details

Matters of National Environmental Significance

Threatened Ecological Communities [Dataset Information]	Status	Type of Presence
Peppermint Box (<i>Eucalyptus odorata</i>) Grassy Woodland of South Australia	Critically Endangered	Community likely to occur within area
Threatened Species [Dataset Information]	Status	Type of Presence
Birds		
Rostratula australis Australian Painted Snipe	Vulnerable	Species or species habitat may occur within area
Reptiles		
Aprasia pseudopulchella Flinders Ranges Worm-lizard	Vulnerable	Species or species habitat likely to occur within area

Plants

[Olearia pannosa subsp. pannosa](#)
Silver Daisy-bush

[Prasophyllum pallidum](#)
Pale Leek-orchid

[Thelymitra cyanapicata](#)
Blue Top Sun-orchid, Dark-tipped Sun-orchid

Migratory Species [[Dataset Information](#)]

Migratory Terrestrial Species

Birds

[Haliaeetus leucogaster](#)
White-bellied Sea-Eagle

[Hirundapus caudacutus](#)
White-throated Needletail

[Merops ornatus](#)
Rainbow Bee-eater

Migratory Wetland Species

Birds

[Ardea alba](#)
Great Egret, White Egret

[Ardea ibis](#)
Cattle Egret

[Rostratula benghalensis s. lat.](#)
Painted Snipe

Migratory Marine Birds

[Apus pacificus](#)
Fork-tailed Swift

[Ardea alba](#)
Great Egret, White Egret

[Ardea ibis](#)
Cattle Egret

Other Matters Protected by the EPBC Act

Listed Marine Species [[Dataset Information](#)]

Birds

[Apus pacificus](#)
Fork-tailed Swift

[Ardea alba](#)
Great Egret, White Egret

[Ardea ibis](#)
Cattle Egret

[Haliaeetus leucogaster](#)
White-bellied Sea-Eagle

[Hirundapus caudacutus](#)
White-throated Needletail

[Merops ornatus](#)
Rainbow Bee-eater

Vulnerable Species or species habitat likely to occur within area

Vulnerable Species or species habitat likely to occur within area

Critically Endangered Species or species habitat may occur within area

Status Type of Presence

Migratory Species or species habitat likely to occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat may occur within area

Status Type of Presence

Listed - overfly marine area Species or species habitat may occur within area

Listed - overfly marine area Species or species habitat may occur within area

Listed - overfly marine area Species or species habitat may occur within area

Listed Species or species habitat likely to occur within area

Listed - overfly marine area Species or species habitat may occur within area

Listed - overfly marine area Species or species habitat may occur within area

[Rostratula benghalensis s. lat.](#)
Painted Snipe

Commonwealth Lands [[Dataset Information](#)]

Defence

Defence - Defence Housing Authority

Transport and Regional Services - Australian National Railways Commission

Places on the RNE [[Dataset Information](#)]

Note that not all Indigenous sites may be listed.

Historic

[ANZ Bank SA](#)

[Bank of South Australia \(former\) SA](#)

[Baptist Church SA](#)

[Bunyip Printing Office SA](#)

[Catholic Presbytery SA](#)

[Catholic School SA](#)

[Church Hill State Heritage Area SA](#)

[Double Fronted Villa SA](#)

[Eagle Foundry \(former\) SA](#)

[Engineering and Water Supply Main Depot SA](#)

[Essex House SA](#)

[Exchange Hotel SA](#)

[Exhibition Building SA](#)

[Fire Station \(former\) SA](#)

[Gawler Arms Hotel SA](#)

[Gawler Conservation Area SA](#)

[Gawler Court House SA](#)

[Gawler Institute SA](#)

[Gawler Mill \(former\) SA](#)

[Gawler Post Office \(former\) SA](#)

[Gawler Primary School SA](#)

[Gawler Railway Station SA](#)

[Gawler Telegraph Station \(former\) SA](#)

[Harris and Sons Drapery Store \(former\) SA](#)

[Hemingby Residential Group SA](#)

[Hospital \(former\) SA](#)

[House SA](#)

[House SA](#)

[House SA](#)

[House SA](#)

[House SA](#)

[Kingsford Hotel SA](#)

[Lutheran Education Centre SA](#)

[Mars Hill SA](#)

[Martindale SA](#)

[McKinlay Memorial SA](#)

Listed - overfly marine area

Species or species habitat may occur within area

[National Bank SA](#)
[Oddfellows Hall \(former\) SA](#)
[Old Bushman Hotel SA](#)
[Old Spot Hotel SA](#)
[Para Para SA](#)
[Phoenix Foundry \(former\) SA](#)
[Piles Building SA](#)
[Prince Albert Hotel SA](#)
[Savings Bank of South Australia \(former\) SA](#)
[Southend Hotel SA](#)
[St Andrews Presbyterian Church \(former\) SA](#)
[St Georges Anglican Church Hall SA](#)
[St Georges Anglican Church SA](#)
[St Josephs Catholic Convent \(former\) and Rosary Cottage SA](#)
[St Peter and St Pauls Roman Catholic Church SA](#)
[Taylor and Forgie Workshop \(former\) SA](#)
[Town Hall SA](#)
[Tramway Bridge SA](#)
[Union Mill Offices SA](#)
[United Parish Church Hall \(former\) SA](#)
[Uniting Church Hall SA](#)
[Uniting Church Manse SA](#)
[Uniting Church SA](#)
[Victoria Flour Mill \(former\) SA](#)
[Wesleyan Methodist Manse \(former\) SA](#)
[Wilcox Buildings SA](#)
[Zion Lutheran Church SA](#)

Caveat

The information presented in this report has been provided by a range of data sources as [acknowledged](#) at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the *Environment Protection and Biodiversity Conservation Act 1999*. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under "type of presence". For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the [migratory](#) and [marine](#) provisions of the Act have been mapped.

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as [extinct or considered as vagrants](#)
- some species and ecological communities that have only recently been listed
- [some terrestrial species](#) that overfly the Commonwealth marine area
- migratory species that are very [widespread, vagrant, or only occur in small numbers](#).

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites;
- seals which have only been mapped for breeding sites near the Australian continent.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgments

This database has been compiled from a range of data sources. The Department acknowledges the following custodians who have contributed valuable data and advice:

- [New South Wales National Parks and Wildlife Service](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Water and Environment, Tasmania](#)
- [Department of Environment and Heritage, South Australia Planning SA](#)
- [Parks and Wildlife Commission of the Northern Territory](#)
- [Environmental Protection Agency, Queensland](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- Other groups and individuals

[ANUCLiM Version 1.8, Centre for Resource and Environmental Studies, Australian National University](#) was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

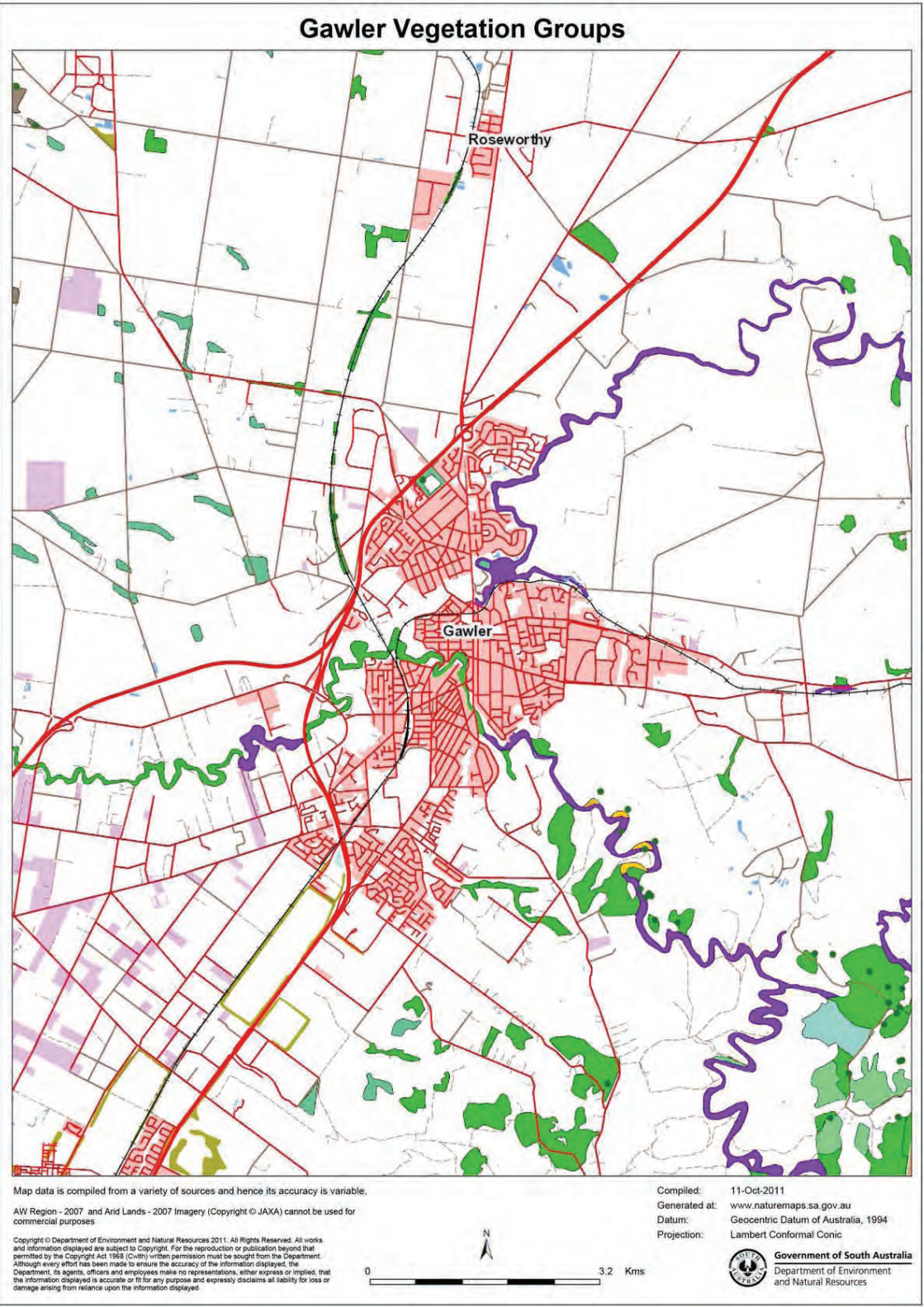
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Appendix 3 – Mapped NVIS Vegetation Groups





Legend

- Fauna - Biol Survey SA
- Flora - Biol Survey SA
- State Border
- State Border
- Coastline/River
- Roads
- Highway (divided)
- Sealed
- Sealed within Builtup Area
- Unsealed
- Unsealed within Builtup Area
- Vehicular Track
- Ramsar Sites
- Forest Reserves
- Conservation Areas
- Native Forest Reserves
- NPWSA Reserves
- National Parks
- Conservation Parks
- Conservation Reserves
- Game Reserves
- Recreation Parks
- Regional Reserves
- Wilderness Protection Areas
- Aquatic Reserves
- River Murray
- Veg Floristic (NVIS)
- Acacia woodland
- Allocasuarina forest and woodland
- Avicennia forest and woodland
- Callitris forest and woodland
- Casuarina woodland
- Eucalyptus forest and woodland
- Melaleuca forest and woodland
- Myoporum woodland
- Alectryon woodland and shrubland
- Woodland
- Eucalyptus mallee forest and mallee woodland
- Eucalyptus mallee shrubland
- Acacia shrubland
- Melaleuca shrubland
- (cont)
- Shrubland >1m
- Shrubland <1m
- Heath shrubland
- Coastal shrubland
- Chenopod shrubland
- Samphire shrubland
- Tussock grassland
- Hummock grassland
- Grassland
- Rushland/Sedgeland
- Fernland/Herbland
- Vegetation mapping (no floristic data)
- Native Veg Cover

Appendix 4 – Native Flora Species List



Appendix 4 Native flora species recorded in Study Area (data source Adrian Shackley April 2013, Seaman et.al 2000a, 2000b, Kellogg Brown Root 2010, Kellogg Brown Root 2012)

Conservation ratings						
Botanical name	Common Name				Record	Record
		Aust	SA	Southern Lofty	North Para, Whitelaw Creek	South Para, Gawler River
Acacia acinacea	Wreath Wattle				x	x
Acacia ligulata	Umbrella Bush			K	x	
Acacia notabilis	Notable Wattle			K	x	
Acacia pycnantha	Golden Wattle				x	x
Acaena echinata	Sheep's burr					
Alternanthera denticulata	Lesser Joyweed			U		x
Aristida behriana	Brush Wire-grass			U	x	x
Arthropodium fimbriatum	Nodding Vanilla-lily				x	x
Arthropodium strictum	Common Vanilla-lily				x	x
Atriplex semibaccata	Berry Saltbush				x	x
Atriplex suberecta	Lagoon Saltbush				x	x
Austrodanthonia auriculata	Lobed Wallaby-grass				x	
Austrodanthonia caespitosa	Common Wallaby-grass				x	x
Austrodanthonia fulva	Leafy Wallaby-grass			U	x	
Austrodanthonia geniculata	Kneed Wallaby-grass					
Austrodanthonia pilosa	Velvet Wallaby-grass					
Austrodanthonia racemosa var. racemosa	Slender Wallaby-grass				x	x
Austrodanthonia setacea var. setacea	Small-flower Wallaby-grass				x	x
Austrostipa acrocliata	Graceful Spear-grass			R	x	
Austrostipa blackii	Crested Spear-grass				x	x
Austrostipa curticomma	Short-crest Spear-grass			U		x
Austrostipa drummondii	Cottony Spear-grass				x	x
Austrostipa eremophila	Rusty Spear-grass			U	x	x
Austrostipa flavescens	Coast Spear-grass					x
Austrostipa nitida	Balcarra Spear-grass				x	
Austrostipa nodosa	Tall Spear-grass				x	x
Austrostipa pilata	Prickly Spear-grass		V	T		x
Austrostipa puberla	Spear-grass			K		x
Austrostipa scabra ssp. falcata	Slender Spear-grass				x	x
Baumea arthropophylla	Swamp Twig-rush		R	R		x
Baumea juncea	Bare Twig-rush					x
Boerhavia dominii	Tar-vine				x	x
Bolboschoenus caldwellii	Salt Club-rush				x	x
Bolboschoenus medianus	Marsh Club-rush			R		x
Bulbine bulbosa	Bulbine-lily				x	
Bursaria spinosa	Sweet Bursaria				x	
Callistemon sieberi	River Bottlebrush			U		x
Calostemma purpureum	Pink Garland-lily				x	x
Calystegia sepium	Greater Calystegia			U	x	x
Carex bichenoviana	Notched Sedge			U	x	x
Charmaesyce drummondii	Caustic Spurge				x	x
Cheilanthes distans	Bristly Cloak-fern			R		x
Cheilanthes lasiophylla	Woolly Cloak-fern			E		x
Chenopodium pumilio	Clammy Goosefoot				x	x
Chloris truncata	Windmill Grass				x	x
Convolvulus angustissimus var. angustissimus	Pink Convolvulus					x
Convolvulus angustissimus var. peninsularis	Linear-lobes Convolvulus					x
Convolvulus remotus	Grassland Convolvulus				x	x
Crassula colorata var. acuminata	Dense Crassula				x	x
Crassula decumbens var. decumbens	Spreading Crassula				x	
Crassula sieberiana ssp. tetramera	Australian Stonecrop				x	x
Cullen australasicum	Tall Scurf-pea					x
Cymbopogon ambiguus	Lemon-grass			V		x
Cyperus gymnocaulos	Spiny Flat-sedge				x	x
Cyperus vaginatus	Stiff Flat-sedge					x
Dianella longifolia var. grandis	Pale Flax-lily		R	V	x	x
Dianella revoluta var. revoluta	Black-anther Flax-lily				x	x
Dichanthium sericeum ssp. sericeum	Silky Blue-grass			V	x	x
Digitaria brownii	Cotton Panic-grass			K		x
Distichlis distichophylla	Emu-grass				x	x

Conservation ratings						
Botanical name	Common Name				Record	Record
		Aust	SA	Southern Lofty	North Para, Whitelaw Creek	South Para, Gawler River
Dodonaea viscosa ssp. spatulata	Sticky Hop-bush				x	x
Drosera auriculata	Tall Sundew					x
Drosera whittakeri ssp. whittakeri	Sundew				x	x
Einadia nutans ssp. nutans	Climbing Saltbush				x	
Eleocharis acuta	Spike-rush					x
Elymus scaber var. scaber	Native Wheat-grass				x	x
Enchylaena tomentosa var. tomentosa	Ruby Saltbush					x
Enchylaena tomentosa (prostrate form)	Ruby Saltbush				x	x
Enneapogon nigricans	Black-head Grass				x	x
Enteropogon acicularis	Umbrella Grass				x	x
Epilobium hirtigerum	Hairy Willow-herb				x	
Eremophila longifolia	Weeping Emubush			V		x
Eucalyptus camaldulensis var. camaldulensis	River Red Gum				x	x
Eucalyptus porosa	Mallee Box			U	x	x
Geranium retrorsum	Grassland Geranium				x	
Gonocarpus elatus	Hill Raspwort					
Goodenia pinnatifida	Cut-leaf Goodenia			U		x
Goodenia willisiana [affinis]	Silver Goodenia			R		x
Haloragis aspera	Rough Raspwort			R		
Leiocarpa tomentosa	Woolly Plover-daisy			E		x
Juncus kraussii	Sea Rush					x
Juncus pallidus	Pale Rush					
Juncus pauciflorus	Loose-flower Rush					x
Juncus sarophorus	Finger Rush					x
Juncus subsecundus	Finger Rush					x
Juncus usitatus	Common Rush					x
Leptospermum myrsinoides	Heath Tea-tree			R		x
Lobelia alata	Angled Lobelia			R		x
Lomandra densiflora	Scented Mat-rush					x
Lomandra effusa	Scented Mat-rush			R		x
Lomandra micrantha ssp. micrantha	Small-flower Mat-rush					
Lomandra multiflora ssp. dura	Hard Mat-rush					x
Lomandra nana	Small Mat-rush					x
Lycium australe	Australian Boxthorn			E		
Lythrum hyssopifolia	Lesser Loosestrife					x
Maireana brevifolia	Short-leaf Bluebush					x
Maireana enchylaenoides	Wingless Fissure-plant			U		x
Maireana rohrlachii	Rohrlach's Bluebush		R	V		x
Malva behriana [Lavatera plebeia]	Australian Hollyhock			U		x
Mimulus repens	Creeping Monkey-flower			R		x
Myoporum montanum	Native Myrtle			K		x
Myriophyllum amphibium	Broad Milfoil		R	R		
Myosotis australis	Austral forget-me-not			R		x
Nitella						x
Nitraria billardierei	Nitre-bush					
Oxalis perennans	Native Sorrel					x
Panicum effusum var. effusum	Hairy Panic			K		x
Phragmites australis	Common Reed					x
Pimelea micrantha	Silky Riceflower			R		x
Pittosporum phylliraeoides var. microcarpa	Native Apricot			R		x
Plantago varia	Variable Plantain					
Pleurosorus rutifolius	Blanket Fern			U		x
Poa crassicaudex	Thick-stem Tussock-grass					x
Poa labillardieri var. labillardieri	Common Tussock-grass					x
Portulaca oleracea	Munyeroo, Purslane					x
Ptilotus nobilis var. angustifolius	Yellow-tails					x
Ptilotus spathulatus forma spathulatus	Pussy-tails			R		x
Rhagodia parabolica	Mealy Saltbush			V		
Salsola tragus	Buckbush					x
Samolus repens	Creeping Brookweed			R		

Conservation ratings						
					Record	Record
Botanical name	Common Name	Aust	SA	Southern Lofty	North Para, Whitelaw Creek	South Para, Gawler River
Schoenoplectus litoralis	Shore Club-rush			U		x
Schoenoplectus pungens	Spiky Club-rush			U		x
Senecio odoratus	Scented Groundsel					x
Senna artemisioides nothosp. coriacea	Broad-leaf Desert Senna					
Setaria constrictum	Knotty-butt Paspalidium			R		x
Setaria jubiflorum	Warrego Summer-grass			K		x
Sida corrugata var. angustifolia	Grassland Sida			R		x
Sida corrugata var. corrugata	Corrugated Sida					
Solenogyne dominii	Smooth solenogyne			U		x
Stackhousia monogyna	Creamy Candles					x
Suaeda australis	Austral Seablite					
Teucrium racemosum	Grey Germander			T		
Themeda triandra	Kangaroo Grass					x
Triglochin procerum	Water-ribbons			R		x
Triglochin striatum	Streaked Arrowgrass			R		x
Typha domingensis	Narrow-leaf Bulrush					x
Velleia arguta	Toothed Velleia			R		x
Vittadinia blackii	Narrow-leaf New Holland Daisy			R		x
Vittadinia cervicularis var. cervicularis	Waisted New Holland Daisy					x
Vittadinia cuneata var. cuneata fo cuneata	Fuzzy New Holland Daisy					x
Vittadinia gracilis	Woolly New Holland Daisy					x
Vittadinia megacephala	Giant New Holland Daisy			R		x
Wahlenbergia luteola	Yellow-wash Bluebell					
Wahlenbergia stricta ssp. stricta	Tall Bluebell					x
Whalleya proluta	Rigid Panic			R		
Zygophyllum glaucum	Pale Twinleaf			T		x

Summary of native plant species in Study Area

Total 146 species identified currently. No species with Australian Conservation ratings. 59 with State of Regional Conservation ratings. 1 State Vulnerable Rating, 5 State Rare Rating, Additional Regional Ratings – 3 Endangered, 4 Vulnerable, 2 Threatened, 7 K Uncertain, 22 Rare and 16 Uncommon.

Summary of native plant species in North Para part of Study Area

Total 100 species identified currently. No species with Australian Conservation ratings. 35 with State of Regional Conservation ratings. 3 State Rare Rating, Additional Regional Ratings – 1 Endangered, 3 Vulnerable, 2 Threatened, 3 K Uncertain, 13 Rare and 10 Uncommon.

Summary of native plant species in South Para and Gawler River part of Study Area

Total 120 species identified currently. No species with Australian Conservation ratings. 48 with State of Regional Conservation ratings. 1 State Vulnerable Rating, 3 State Rare Rating, Additional Regional Ratings – 2 Endangered, 3 Vulnerable, 1 Threatened, 5 K Uncertain, 18 Rare and 15 Uncommon.

Conservation Ratings – Symbols used in Tables and Attachments

Australia - Environment Protection and Biodiversity Conservation Act Status

CE	Critically endangered: species is facing an extremely high risk of extinction in the wild
E	Endangered: species is facing a very high risk of extinction in the wild in the near future
V	Vulnerable: species is facing a high risk of extinction in the wild in the near future

South Australia - National Parks and Wildlife Act Status

E	Endangered: rare and in danger of becoming extinct
V	Vulnerable: rare and at risk from potential threats in the long term
	Rare: having a low overall frequency, confined to a restricted range or scattered sparsely over a wider area
R	

Southern Lofty Area - SA Regional Conservation Status

X	Presumed extinct: not recorded for more than 50 years
E	Endangered: rare and in danger of becoming extinct
V	Vulnerable: rare and at risk from potential threats in the long term
T	Threatened: rare and likely to become either endangered or vulnerable
	Rare: having a low overall frequency, confined to a restricted range or scattered sparsely over a wider area
R	
K	Uncertain: either threatened or rare but insufficient data for a more precise assessment
U	Uncommon: less common species but not rare

Additional EPBC information. Critically Endangered Iron-grass Natural Temperate Grassland in Study Area. Subsequent to the compilation of Section 6.4 of this Plan, an Environment Protection and Biodiversity Conservation Act (EPBC) referral for Delfin Lend Lease for proposed residential development at Gawler East occurred. Part of the Study Area (an area of about 1.5 hectares alongside the un-named creek - sometimes called Yaringa Creek or Spring Gully) was identified as Iron-grass Natural Temperate Grassland of South Australia - a Critically Endangered native plant association under the EPBC Act. At that stage this Irongrass association was not shown as possibly occurring in the immediate Gawler area (since corrected). The Referral Report also related to recording of Aprasia pseudopulchella (Flinders Ranges Worm-lizard) - a Vulnerable species under the EPBC Act) in the Study Area and a number of other species of conservation interest. The details of the 2011 Referral and Referral decision are accessible at http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=referral_detail&proposal_id=5826 on the EPBC website.

Appendix 5 – Weed Species List

The background of the page is a solid light grey. On the left side, there are several thin, white, curved lines that sweep across the page from the bottom left towards the top right, creating a sense of movement and design.

Appendix 5. Weed species commonly recorded throughout the study area (data source: Seaman et al. 2000a, 2000b).

Scientific name	Common name
* <i>Acacia saligna</i>	Golden wreath wattle
* <i>Aira caryophyllea/cupaniana</i>	Hair-grass
* <i>Allium triquetrum</i>	Onion Grass
* <i>Apium graveolens</i>	Garden celery
* <i>Arctotheca calendula</i>	Cape weed
* <i>Artemisia arborescens</i>	Silver worm wood
* <i>Arundo donax</i>	Giant reed
* <i>Asclepias rotundifolia</i>	Cottonbush
* <i>Asparagus asparagoides</i>	Bridal Creeper
* <i>Asphodelus fistulosus</i>	Onion weed
* <i>Aster subulatus</i>	Wild aster
* <i>Atriplex prostrata</i>	Mat saltbush
* <i>Avena fatua</i>	Wild oat
* <i>Avena sativa</i>	Bearded Oat
* <i>Brachypodium distachyon</i>	False Brome
* <i>Brassica tournefortii</i>	Wild turnip
* <i>Briza major</i>	Large Quaking-grass
* <i>Bromus catharticus</i>	Prairie Grass
* <i>Bromus diandrus</i>	Great Brome
* <i>Calystegia sepium</i>	Greater bindweed
* <i>Ceratonia siliqua</i>	Carob
* <i>Chenopodium album</i>	Fat hen
* <i>Chrysanthemoides monilifera</i>	Boneseed
* <i>Crassula</i>	Crassula
* <i>Cynara cardunculus</i>	Artichoke thistle
* <i>Cynodon sp.</i>	Couch
* <i>Cynosurus echinatus</i>	Rough Dog's-tail Grass
* <i>Dactylis glomerata</i>	Cocksfoot
* <i>Echium plantagineum</i>	Salvation Jane
* <i>Ehrharta longiflora</i>	Annual Veldt Grass
* <i>Eragrostis cilianensis</i>	Stink Grass
* <i>Erodium cicutarium</i>	Cut-leaf Heron's-bill
* <i>Erodium moschatum</i>	Musky Heron's-bill
* <i>Foeniculum vulgare</i>	Fennel
* <i>Fraxinus sp.</i>	Ash
* <i>Fumaria capreolata</i>	White-flower Fumitory
* <i>Hedera helix</i>	Ivy
* <i>Heliotropium europaeum</i>	Potato weed
* <i>Hordeum murinum</i>	Barley grass
* <i>Hypericum perforatum</i>	St Johns wort
* <i>Hypochaeris glabra</i>	Smooth Cat's Ear

Scientific name	Common name
* <i>Hypochaeris radicata</i>	Rough Cat's Ear
* <i>Lactuca serriola</i>	Prickly Lettuce
* <i>Lepidium africanum</i>	Common peppergrass
* <i>Lolium spp.</i>	Ryegrass
* <i>Lycium ferocissimum</i>	African boxthorn
* <i>Malva parviflora</i>	Marshmallow
* <i>Marrubium vulgare</i>	Horehound
* <i>Morea setifolia</i>	Thread Iris
* <i>Nicotiana glauca</i>	Tree tobacco
* <i>Olea europaea</i>	Olive
* <i>Opuntia stricta</i>	Prickly pear
* <i>Oxalis pes-caprae</i>	Sour sob
* <i>Panicum sp.</i>	Panic grass
* <i>Pennisetum clandestinum</i>	Kikuyu
* <i>Phalaris aquatica</i>	Canary grass
* <i>Piptatherum miliaceum</i>	Rice Millet
* <i>Plantago coronopus</i>	Bucks-horn Plantain
* <i>Plantago lanceolata</i>	Ribwort
* <i>Plantago sp.</i>	Hairy Plantain
* <i>Poa annua</i>	Winter Grass
* <i>Polygonum aviculare</i>	Wire weed
* <i>Ricinus communis</i>	Caster oil plant
* <i>Romulea minutiflora</i>	Guildford grass
* <i>Romulea rosea</i>	Common Onion-grass
* <i>Rorippa nasturtium-aquaticum</i>	Watercress
* <i>Rosa canina</i>	Dog rose
* <i>Rubus spp.</i>	Blackberry
* <i>Rumex crispus</i>	Curled dock
* <i>Rumex obtusifolius</i>	Broad-leaf Dock
* <i>Salvia verbanaca</i>	Wild sage
* <i>Scabiosa sp.</i>	Scabious
* <i>Schinus molle</i>	Pepper tree
* <i>Solanum nigrum</i>	Black Nightshade
* <i>Sonchus oleraceus</i>	Common Sow-thistle
* <i>Tamarix aphylla</i>	Tamarix
* <i>Tribulus terrestris</i>	Caltrop
* <i>Trifolium angustifolium</i>	Narrow-leaf Clover
* <i>Trifolium campestre</i>	Hop Clover
* <i>Trifolium dubium</i>	Suckling Clover
* <i>Trifolium sp.</i>	Clovers
* <i>Trifolium strictum</i>	Trifolium sp.
* <i>Tropaeolum majus</i>	Nasturtium
* <i>Vicia sativa</i>	Common Vetch
* <i>Vulpia bromoides</i>	Squirrel-tail Fescue
* <i>Vulpia myuros</i>	Fescue

Appendix 6 – Bird Species List



Appendix 6. Bird species commonly recorded throughout the study area (data source: Jamieson and White 2009)

Species	Local Status	Regional Status	Seasons	Location and date of observation
Adelaide Roseella	C	C	All	River and parks, including Clonlea and Dead Man's Pass Reserve 2008
Australasian Grebe	U	C	All	River
Australian Hobby	U	M	All	North Para in Hewett
Australian Magpie	C	C	All	River and parks, including Clonlea and Dead Man's Pass Reserve 2008
Australian Wood Duck	C	C	W*	River
Barn Owl	U	U	All	Gawler South 2004
Black Shouldered Kite	R	M	All	
Blackbird	C	C	All	River and parks, including Clonlea and Dead Man's Pass Reserve 2008
Black-faced Cuckoo-shrike	C	C	S*	Deadmans Pass, South Para
Black-tailed Native Hen	U	M	All	
Blue-winged Parrot	R	U	O	Doubtful sighting
Brown Falcon	U	U	All	Para Woodlands Oct 2008
Brown Thornbill	R	M	All	
Brown Treecreeper	R	U	All	Para Woodlands May 2003, Somerton Rd Dec 2009
Budgerigar	R	C	O	Gawler bypass 2005
Clamorous Reed-warbler	C	M	S	Clonlea & above Deadmans Pass
Cockathiel	R	C	All	Willaston
Collared Sparrowhawk	U	MC	All	Deadmans Pass, May 2009
Common Bronzewing	R	M	All	Parks
Crested Pigeon	A	A	All	Town and parks, including Clonlea and Dead Man's Pass Reserve 2008
Crested Shrike-tit	R	R	O	Deadman's Pass Mar 2008
Diamond Firetail	U	U	All	Grasslands, Gawler East
Dusky Moorhen	C	C	All	Clonlea
Dusky Woodswallow	U	C	S*	Deadmans Pass
Elegant Parrot	U	C	All	
European Goldfinch	C	M	All	Gawler South
Fairy Martin	U	C	S*	Bred Clonlea summer 2008-9
Feral Pigeon	A	A	All	Town and parks
Galah	C	A	All	River and parks, including Clonlea and Dead Man's Pass Reserve 2008
Golden	R	C	All	Gawler East Jun 2008

Species	Local Status	Regional Status	Seasons	Location and date of observation
Whistler				
Great Egret	U	C	W*	River nr Senior Cits Club 2002
Greenfinch	M	U	All	Gawler East, Gawler South
Grey Shrike-thrush	C	C	All	Deadmans Pass
House Sparrow	A	C	All	Gardens, boxthorn, Gawler East
Jacky Winter	R	U	All	
Laughing Kookaburra	C	C	All	River and parks
Little Corella	A	C	All	River, town centre to junction and Clonlea Reserve
Little Grassbird	U	MC	?	Deadman's Pass Sept 2008
Little Pied Cormorant	C	C	All	Clonlea
Little Raven	C	C	All	Gawler East and Clonlea and Dead Man's Pass Reserve 2008
Little Wattlebird	C	M	All	Parks and gardens, Clonlea Reserve 2008
Magpie-lark	C	C	All	Parks and gardens, including Clonlea and Dead Man's Pass Reserve 2008
Masked Plover	C	C	All	Para Woodlands, Clonlea
Mistletoe Bird	U	U	All	
Musk Lorikeet	C	C	All	Flowering eucalypts, Clonlea Reserve 2008
Nankeen Kestrel	M	M	All	Grasslands, Gawler East
Nankeen Night Heron	R	U	All	River Junction 2004
New Holland Honeyeater	C	C	All	Parks and gardens, including Clonlea and Dead Man's Pass Reserve 2008
Noisy Miner	C	M	All	Gardens, Deadman's Pass and Clonlea Reserve
Pacific Black Duck	C	C	W*	River
Peregrin Falcon	U	U	All	Allendale Rd quarry Jan 2009 (breeding)
Purple Swamphen	U	M	All	Clonlea Reserve 2008
Purple-crowned Lorikeet	C	C	All	Flowering eucalypts
Rainbow Bee-eater	C	M	S	Clonlea
Rainbow Lorikeet	C	C	All	Flowering eucalypts
Red Wattlebird	C	C	All	Parks and gardens, including Clonlea and Dead Man's Pass Reserve 2008
Red-browed Finch	U	M	All	
Red-rumped Parrot	C	C	All	River and reserves, especially Clonlea Reserve
Reed warbler				Dead Man's Pass Reserve 2008
Restless Flycatcher	R	U	All	
Richards Pipit	U	M	All	Grasslands, Gawler East
Rock dove				Clonlea Park and Dead Man's Pass Reserve 2008
Royal Spoonbill	R	U	O	Parkers Road, Gawler Belt 2005
Rufous	U	U	S	Para Woodland 2004, Junction, Sept 2009

Species	Local Status	Regional Status	Seasons	Location and date of observation
Songlark				
Sacred Kingfisher	U	M	S*	River junction Jan. 2008
Scarlet Robin	R	U	All	
Silver Gull	C	A	All	Town and parks
Silvereye	MC	C	All	Numerous sighting Sep 2009
Skylark	C	M	All	Grasslands, Gawler East
Southern Boobrook	U	M	All	Gawler South 2003
Spotted Turtle-Dove	A	C	All	Town, and Clonlea Park and Dead Man's Pass Reserve 2008
Square-tailed Kite	R	R	O	Near Post Office Dec 2007
Starling	A	A	All	Parks and gardens, including Clonlea and Dead Man's Pass Reserve 2008
Straw-necked Ibis	U	U	W	Parkers Road, Gawler Belt 2005
Striated Pardalote	C	C	S*	Para Woodlands May 2003, Occasionally along South Para
Striated Thornbill	R	M	All	
Stubble Quail	U	C	All	Para Woodland
Sulphur-crested Cockatoo	C	C	All	River and parks
Superb Blue Wren	U	C	All	Clonlea Reserve, above Deadman's Pass
Tawny Frogmouth	U	M	All	Clonlea 2004
Tree Martin	U	C	S*	
Wedge-tailed Eagle	R	M	All	
Weabill	R	M	All	
Welcome Swallow	C	C	All	Para Woodlands
White faced Heron	M	C	All	Clonlea Park and Dead Man's Pass Reserve 2008
White Winged Triller	U	MC		Common birth of Gawler spring 2008
White-browed Babbler	R	C	O	Rail corridor, Gawler Belt
White-plumed Honeyeater	C	C	All	River and town, including Clonlea Park and Dead Man's Pass Reserve 2008
Willie Wagtail	C	C	All	Parks and gardens, including Clonlea and Dead Man's Pass Reserve 2008
Yellow-rumped Thornbill	R	M	All	
Yellow-billed Spoonbill	R	U	O	Parkers Road, Gawler Belt 2005
Zebra Finch	R	M	All	Hillier

Legend

Seasons

S	Spring/Summer
S*	Mainly Spring - Summer
W	Winter
W*	Mainly Winter
O	Variable

Status

A	Abundant
C	Common
M	Modestly common
U	Uncommon
R	Rare

Additional bird species recorded by Kellogg Brown Root 2010, 2012 in or adjacent Study Area.

Scientific name	Common name
<i>Aphelocephala leucopsis</i>	Southern whiteface
<i>Circus assimilis</i>	Spotted harrier
<i>Haliastur sphenurus</i>	Whistling kite
<i>Aegotheles cristatus</i>	Australian owlet-nightjar
<i>Anas gracilis</i>	Grey teal
<i>Corcorax melanorhamphos</i>	White-winged chough
<i>Cacomantis pallidus</i>	Pallid cuckoo
<i>Cheramoeca leucosterna</i>	White-backed swallow
<i>Cincloramphus cruralis</i>	Brown songlark
<i>Epthianura albifrons</i>	White-fronted chat
<i>Pardalotus punctatus</i>	Spotted pardalote
<i>Petroica goodenovii</i>	Red-capped robin
<i>Northiella haematogaster</i>	Blue bonnet
<i>Fulica atra</i>	Eurasian coot
<i>Gallirallus philippensis melli</i>	Buff-banded rail
<i>Porzana fluminea</i>	Australian spotted crane
<i>Gallinago hardwickii</i>	Latham's snipe
<i>Threskiornis spinicollis</i>	Straw-necked ibis
<i>Threskiornis molucca</i>	Australian White ibis
<i>Porphyrion porphyrio</i>	Eastern Swamp hen
<i>Melithreptus gularis gularis</i>	Black-chinned honeyeater
<i>Glossopsitta pusilla</i>	Little lorikeet
<i>Daphoenositta chrysoptera</i>	Varied sittella
<i>Chalcites lucidus</i>	Shining bronze-cuckoo
<i>Chalcites basalis</i>	Horsefield's bronze-cuckoo

Additional note for Appendix 6:

In 2011 and 2012 Gawler East bird watcher David Hartland recorded a pair of Black-chinned Honeyeaters successfully breeding in a tree immediately adjacent Dead Man’s Pass and Coombe St. Gawler East.

These records are located in eremaea.com - a birdwatchers website. Kellogg Brown Root 2012 also recorded an adult and juvenile Black-chinned Honeyeater just east of Dead Man’s Pass – probably the same birds.

These records are very significant for the area given that Black-chinned Honeyeaters are now very rare in the Mount Lofty Ranges.

The establishment of Para Woodland reserve (about 2 kms upstream of Dead Man’s Pass) was in part to provide habitat for Black-chinned Honeyeater s and some other species which are in danger of extinction in the Mount Lofty Ranges.

Appendix 7 – Frog Species List

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Frog species recorded within and surrounding the Gawler Township area from 1994 to 2005, and during 2008
(compiled data, source: Alan Jamieson, Gawler Frog Watch).

Site Name	Species recorded					
	Banjo Frog	Bibron’s Toadlet	Brown Tree Frog	Common Froglet	Eastern Banjo Frog	Painted Frog
Brown St, Willaston				1	1	
Burrows St, Willaston				4		
Clifford Rd, Hillier, gazebo pond				1		
Clonlea Park	2	1	1	15	5	
Cockshell Rd						
Coultard Park, Nuriootpa			1	1	1	
Dead Man’s Pass	9		16	33	6	1
Drury St, Willaston			2	3	1	
Eckerman Ave, Gawler South			1	6	6	
Eighth St, Gawler West			2	2	1	
Essex Park, Gawler	2		2	7	4	
Finniss Ave, Gawler				1		
Food Forest Learning Ctr, Clifford Rd, Hillier, pond			1	1		
Food Forest, Clifford Road, Hillier, tank			1	1		
Food Forest, Gawler R landing, Clifford Rd, Hillier			1	1	1	
Fourteenth St, Gawler, South Para River			4	14	6	
Gawler Caravan Park, Gawler				1		
Gawler River, North Para R & South Para River junction, Gawler	1		5	8	6	
Gawler River	1					
Gawler Tce, Gawler				5	1	
Hallam St, Gawler				1	1	
Harris Road, Concordia	1			2	1	
Hillier Rd, Hillier				1	1	
Julian Tce, Gawler			1	1		
Kelly Rd, Willaston				1	1	
Lawrence Ave, Gawler			1	1	1	
Linear Park, Nuriootpa			1	1	1	
Main North Rd, Willaston				1	1	
Millers Rd, Gawler				1		
Murray Rd. Ford, Gawler				2	2	
North Para R, Gawler North		1		5	3	
North Para River				2	1	
O’Dea Ct, Gawler East				1		
Salt Creek				1	1	
South Para River			1	2	1	
Twelfth St & Bridge St, Gawler			1	4	2	
Veale St, Gawler West			2			
Winkel Bridge, Gawler River				4	1	
Grand Total	16	2	44	136	57	1

Appendix 8 – Additional Fauna Species



Appendix 8 Additional Fauna Species recorded in Study Area in recent years.

Native reptiles recorded 2008-2013 Clonlea, Dead Mans' Pass and nearby	
Adrian Shackley April 2013 (Based on Kellogg Brown and Root 2010, Waterwatch data, GEHA grasslands survey 2013, observation)	
Lizards, Skinks, Geckos	
Scientific name	Common name
<i>Aprasia pseudopulchella</i>	Flinders Ranges Worm-lizard
<i>Christinus marmoratus</i>	Marbled Gecko
<i>Cryptoblepharus pannosus</i>	Speckled Wall Skink
<i>Cryptoblepharus plagiocephalus</i>	Wall Skink
<i>Ctenotus robustus</i>	Eastern Striped Skink
<i>Delma malleri</i>	Southern Scalyfoot
<i>Hemiergis peronii</i>	Four-toed Earless Skink
<i>Lampropholis guichenoti</i>	Grass Skink, Garden Skink
<i>Lerista bougainvillii</i>	Bougainville's Skink
<i>Menetia greyii</i>	Common Dwarf Skink
<i>Morethia obscura</i>	Shrubland Morethia Skink
<i>Pogona barbata</i>	Eastern Bearded Dragon
<i>Tiliqua rugosa</i>	Sleepy Lizard
<i>Tiliqua scincoides scincoides</i>	Eastern Bluetongue
Snakes	
Scientific name	Common name
<i>Parasuta flagellum</i>	Little Whip Snake
<i>Pseudechis porphyriacus</i>	Red-bellied Black Snake
<i>Pseudonaja textilis</i>	Eastern Brown Snake
Tortoise	
Scientific name	Common name
<i>Chelodina longicollis</i>	Long-necked Tortoise
Native fish recorded in North or South Para 2000-2013	
Scientific name	Common name
<i>Pseudaphritis urvillii</i>	Congolli
<i>Galaxias olidus</i>	Mountain Galaxias
<i>Galaxias maculatus</i>	Common Galaxias
<i>Pseudogobius olorum</i>	Bluespot Goby
<i>Anguilla australis</i>	Short-finned Eel
<i>Philypnodon grandiceps</i>	Flat-headed Gudgeon
Native mammals recorded 2008-2013 Clonlea Dead Mans' Pass and nearby	
Scientific name	Common name
<i>Hydromys chrysogaster</i>	Water Rat
<i>Macropus giganteus</i>	Eastern Grey Kangaroo
<i>Phascolarctos cinereus</i>	Koala (single transient sighting)
<i>Pseudocheirus peregrinus</i>	Ringtail Possum
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna
<i>Trichosurus vulpecula</i>	Brushtail Possum
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat
<i>Mormopterus petersi</i>	Lesser Long-Eared Bat
<i>Nyctophilus geoffroyi</i>	Southern Freetail Bat
<i>Tadarida australis</i>	White-striped Freetail Bat
<i>Vespadelus darlingtoni</i>	Large Forest Bat