



Jan Juc Creek Linear Reserve

Master Management Plan Report

Adopted 27 June 2012

Revision J

Jan Juc Creek Linear Reserve Master Management Plan Report

Prepared by: GHD Pty Ltd for Surf Coast Shire

Purpose:

This Master Plan Report builds on the previous issues and opportunities paper through development of a Master Management Plan Report, responding to public consultation and Surf Coast Shire directives for the above public asset.

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Executive Summary

The Jan Juc Creek Linear Reserve Master Management Plan Report forms part of a suite of documents comprising the following:

- Jan Juc Linear Reserve Master Plan
- Spring Creek Linear Reserve Master Plan
- Bob Pettitt Reserve Master Plan Review, and
- Spring Creek Recreation Reserve Master Plan Review.

The Draft Master Management Plan for the Jan Juc Creek Linear Reserve provides a strategic direction for long term development, environmental health, protection, maintenance works, and identification of opportunities for the enhancement of this valuable public open space.

The key components of this document are the Landscape Master Plan, being a vision for the linear open space, and the Management Plan, which specifically considers asset management, river health and waterway management. The recommendations have been summarised, budgeted and prioritised for implementation over a ten-year period.

Some key findings of this report are:

- There are a variety of opinions as to the future of the creek itself as well as the reserve. Through community consultation many of these opinions were recorded and are included in the appendices.
- Community interest in this open space is strong and a sense of ownership already exists.
- The input of the Project Reference Group and Project Steering Group provided a comprehensive understanding of the issues relating to this project including; land use, vegetation quality and community expectations regarding day-lighting of the creek.
- The existing site characteristics are some of the key defining elements of this creek and reserve, and inform the landscape character. These defining elements were analysed and assessed by GHD as part of the development of this Master Plan.

Community consultation conducted through a listening post on 9 July 2011, through direct contact with nominated user groups and via public display and feedback for an 8 week period (March - April 2012) identified a range of views and issues that were important to the community including:

- Paths and connectivity.
- Waterway health, indigenous vegetation and ecology.
- Balance between passive and active recreation.
- Signage and wayfinding.
- Car parking and seasonal demands on the reserve.
- Sightlines, views and vistas.
- Fire safety and safety in general.

Key Master Plan recommendations include:

- Site-wide weed management and revegetation to ensure the landscape character incorporates the indigenous plant species of the area **in line with recommendations of the 2009 Beacon Ecological report**).
- Complete the circulation network through the linear reserve, including the provision of paths, ramps, steps, bridges, boardwalks, road crossings and designated on-road routes.
- Development of a suite of elements (furniture, pavements and signage) that connect the disparate open space zones through a uniform materials palette, while maintaining a respect for their unique characteristics.
- Communicate to the community the importance of the creek's health, catchment, and the ecological and cultural values of the reserve through the installation of interpretive signage and artwork.
- Contribute to the ecological value of the creek and linear reserve through installation of water sensitive urban design (WSUD interventions, a new wetland and overall stormwater management).
- Enhancement of play space and formal recreation areas, along with formalised parking for both year-round use and seasonal or event base fluctuations in demand for off street parking.

- Development of WSUD elements including a billabong seasonally inundated area for enhanced ecological value and stormwater management.
- Reconstructing as much of Jan Juc Creek as possible subject to detailed investigation, which is to be undertaken as the highest priority. Once investigation completed the issue should be taken back to the local community.
- Support signage/interpretation along Jan Juc Creek Linear Reserve.
- Speed humps at Carnarvon Ave to slow traffic. (Surf Coast Shire traffic engineers investigate traffic calming options.)
- Installation of shade structures in strategic locations in addition to the planting of shade-giving trees.
- Install a retaining wall beside the path that runs along the northern edge of the oval to prevent soil washing on to the path

Key Management Plan recommendations include and should as a priority focus on:

- Protection and enhancement of remnant vegetation.
- Raising community awareness of the ecological, indigenous heritage and landscape management issues relating to the creek and linear reserve.
- Fire safety and public safety.
- Accessibility and delineation of boundaries, including controlled access by vehicles and in some areas pedestrians.
- Strategic replacement and maintenance of infrastructure and recreation elements.
- Weed plant and pest control.
- Enhancing water quality and river health, incorporating WSUD measures and aquatic and riparian vegetation.

Achievement of these recommendations is anticipated to be carried out over a ten-year timeframe, with implementation structured according to Council budget and community aspirations for the site. Some recommendations have been rated with higher priority in order to assist in coordinating the implementation of the recommendations.

Acknowledgements

Project Reference Group members:

Rowan Mackenzie, Chris Lewis, Kevin Walsh, Rachel Brown, Leanne Lucas, Jackie Scally, Trent Wallis, Bonnie Fagan, Sean Fagan, Mike Bodsworth, Tammy Smith, Brendan Walsh, Paul Gangell, Vaughn Notting, Janice Lane, Simon Breer and Gayle Seddon.

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Further information:

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Glossary

Glossary

BPEMG - Best Practice Environmental Management Guidelines

CCMA - Corangamite Catchment Management Authority

CFA - Country Fire Authority

CPTED - Crime Prevention Through Environmental Design

DSE - Department of Sustainability & Environment

DPCD - Department of Planning & Community Development

EPA - Environment Protection Authority

ES01 - Environmental Significance Overlay

EVC - Ecological Vegetation Class

FO - Floodplain Overlay

JJCLR - Jan Juc Creek Linear Reserve

LSIO - Land Subject to Inundation Overlay

MAV - Municipal Association of Victoria

MMP - Master Management Plan

POS - Public Open Space

PRG - Project Reference Group

PSG - Project Steering Group

SEPP - State Environment Protection Policy

SCS - Surf Coast Shire

WSUD - Water Sensitive Urban Design

1.0 Project Background

1.1 Introduction

The Jan Juc Creek Linear Reserve (JJCLR) is an important place for its highly valued contribution to the open space and connectivity of Jan Juc. The population growth in both Torquay and Jan Juc will continue to place increasing pressure on the limited available open space of the Jan Juc corridor. The value of the environmental and social aspects of this open space is also of great importance to the community. In order to retain such value it is important for future planning to identify ways to enhance the existing environmental values while meeting community expectations for access and recreation.

The JJCLR Master Management Plan (MMP) aims to deliver key outcomes for the community, including quality recreation spaces, improved health opportunities and connectivity, as well as the enhancement and maintenance of conservation opportunities incorporating the natural values of the reserve.

The success of the Master Planning process is to understand the important social and environmental values, the processes that threaten these values and identify activities to reduce the threat into the future. The process should also consider critical economic influences, and how these can best contribute to the long-term success of the MMP.

1.2 Brief

The Surf Coast Shire Council (SCS) engaged GHD in May 2011 to work with Council and the community to develop a Master Plan for the Jan Juc Creek (upstream of Bob Pettitt Reserve to and including Apex Park).

The brief for the MMP for JJCLR followed identification by the Surf Coast Shire (SCS) of the need to develop strategic directions for long term development environmental health and protection prioritised maintenance works; identification of opportunities that are currently not being realised, and the importance of 'green spines' like JJCLR for not only the local residents, but also visitors to the area and future generations.

The brief required preparation of a Master Management Plan developed in conjunction with community, key stakeholder and SCS feedback. The MMP is to comprise: a landscape Master Plan; a management plan addressing key landscape, river health and stormwater management issues; and an implementation plan prioritised and costed over a 10-year framework.

The MMP was developed through a lengthy process that included:

- Invitation to community members to form a Project Steering Group (PSG) to provide community representatives and key stakeholders with the opportunity to have input into the direction and development of the project.
- Invitation to Project Reference Group (PRG) members to provide technical advice on the project and ensure all relevant issues are considered.
- Site visits by GHD.
- Public consultation through a variety of media including: ongoing engagement with the PSG & PRG; 'listening post' on site at Bob Pettitt Reserve on Jan Juc Creek (July); posting of information on the Council website; advertising in local papers; and invitations to the community to contribute to the early planning phase.
- Consultation with user groups via phone, email and on-site meetings.
- Consultation with relevant statutory bodies.
- Documentation of an issues and opportunities discussion paper capturing information on the present status of the reserve, identifying a number of establishing principles (including known issues for each of the study areas) and the opportunities that arise to address the core objectives of the brief to improve the landscape amenity, connectivity and the health of the creek system.
- Development of a Draft Master Management Plan.
- Community engagement of 8 weeks on the draft Master management Plan, including; 'Listening Posts', public display at the council offices, mail out to local residents, posters placed on site, information on the council website and information in the local media
- Feedback from community engagement was collated and discussed with the Project Steering Group, Project Reference Group, SCS executive and councillors and direction given for final changes to be made to the document.



The following detailed objectives, considered as key elements of the site, include:

Landscape Amenity

- a place that is attractive;
- a place that has a landscape character in harmony with the natural environment;
- a place that has a continuous language or elements, materials and spaces;
- a community artery and green spine leading to/from other key community and natural facilities; and
- improved vegetation strategies using relevant ecological vegetation classes (EVCs).

Connectivity

- a place that integrates with existing and proposed surrounding areas;
- a place that is accessible to everyone;
- links with other potential green spines to promote corridors through urban development;
- a place which has a continuous connection from the coastline to the upper reaches of JJCLR; and
- a place which is easily navigated and understood through appropriately designed signs.

Creek System

- improve the health of the creek system;
- improve condition of remnant vegetation; and
- a place which provides habitat for local fauna;

This MMP has been prepared with the above objectives in mind, and is required to provide a strategic direction to the works within the JJCLR for both the SCS and active community groups keen to assist in its rehabilitation and preservation. It presents an opportunity to be an example in the way it nurtures attitudes and protects the significant natural qualities of the area, how people interact and move within the area, and the overall experience and messages delivered.

Remnant vegetation

1.3 Structure of the Report

This report specifically addresses the JJCLR. As is consistent with the aims of the Consultant Brief, each of the following specialist areas have been considered:

- landscape (Landscape and open space use and amenity)
- river health (water quality and ecology), and
- stormwater and waterway management.

Although the themes have (in part) been presented separately, it must be noted that outcomes from studies within each specialist area have been considered and are presented within an integrated master and management planning approach.

This document is structured to present introductory information, including an outline of the project brief, definition of the study area, provision of background information, outline of the planning framework and brief overview of the consultation strategy. The full versions of any supporting documents have been referenced and are readily available from the SCS.

Following the introductory information, the MMP is presented in three key sections:

1. Landscape Master Plan: presentation of landscape, river health and stormwater design and management solutions, and recommendations.
2. Management Plan: identifies management objectives.
3. Implementation Plan: priorities for implementation.

Achievement of the recommendations is anticipated to be implemented over a 10-year time frame, structured in accordance with Council budget and community aspirations for the site.

1.4 Study Area

The study area (Figure 1) includes a section of Jan Juc Creek within the Jan Juc and Torquay area. The site lies approximately 20 kilometres south of Geelong and 85 kilometres south-west of Melbourne.

The study area is located within the Otway Plain Bioregion and the management boundaries of the SCS and the Corangamite Catchment Management Authority (CCMA).

The Jan Juc Creek Linear Reserve is Council freehold land and is bordered by the Jan Juc Foreshore, residential housing and the Bob Pettitt Reserve. The area supports a mix of vegetation including remnant terrestrial and aquatic vegetation, indigenous vegetation and open grass areas. The linear reserve intersects Hoylake Avenue, Duffields Road, Torquay Boulevard and Domain Road.



Figure 1 - Study area boundary

1.5 Existing Information

Prior to the commencement of this project, Council has undertaken a number of studies that serve to inform the MMP.

- Mapping based on the type, extent and conservation significance of ecological vegetation classes (EVCs) for the reserve
- Interpretation Study
- Environmental Management Strategy 2006
- Surf Coast Pathways Strategy Parts A and B July 2006
- Surf Coast Shire Jan Juc Precinct Pathways Project
- Surf Coast Shire Draft Playground Strategy 2009
- Surf Coast Shire Parks and Reserves Asset Management Plan
- Surf Coast Shire Community Engagement Guidelines
- Surf Coast Shire Open Space Strategy 2004
- Surf Coast Shire Urban Stormwater Management Plan, November 2004
- Vegetation Assessment of Jan Juc and Spring Creek, Jan Juc Victoria: EVC Mapping Assessment of Potential Net Gain and Landscape Planning Recommendations, 2009
- Bob Pettitt Reserve Master Plan 2004
- Great Ocean Road Coast Committee Interpretation Action Plan 2009
- Surf Coast Shire Planning Scheme
- The Surf Coast Shire Domestic Animal Management Plan 2008-2011
- All relevant Acts and Regulations
- Any other relevant documents

1.6 Planning Framework Outline

There is a number of existing policy positions in relation to activities that may be conducted within the JJCLR, as outlined below.

The Jan Juc Creek is zoned Public Park and Recreation Zone (PPRZ) from the Jan Juc Surf Life Saving Club to Torquay Boulevard and west of Domain Road to the southern tributary. The area from the Torquay Boulevard and then to the western end of the upper tributary is zoned as Public Conservation and Resource Zone (PCRZ) (Surf Coast Shire Planning Schemes Online 2006). This Zone is suitable for managing and protecting ecological assets within the study area.



1.7 Community Consultation

Community consultation followed the development of the 4 draft master plans and was undertaken in accordance with Council's Community Engagement Strategy.

Initial stakeholder engagement was undertaken, including with members of the Project Steering Group and Project Reference Group, as well as members of key interest groups, including the Friends of Jan Juc Creek, Torquay Landcare and the Surf Coast Action Group. Also, key stakeholders were contacted and listening posts were established to capture stakeholder and community feedback.

- The draft plans were put out for public comment for an eight week period. This began on 4 March and closed on 31 April. The following is a summary of the techniques used.
- Display placed in the council building. This went up in time for the public open day of Saturday 4 February. It included large posters of the four plans. Copies of the documents were also available for perusal. An A3 brochure on each site was also available for people to take away with them. These had information on how to provide feedback or make contact with council. The middle of the folded A3 sheet included the landscape plans and the executive summary was featured on the back.
- The draft master plans of all four sites were placed on the council's website. This included the full documents, the brochures and the posters.
- Public notices were placed in the local newspapers.
- The draft plans and request for feedback was mentioned in the Mayor's newspaper column
- Posters were placed on site. These were put up in prominent positions, with three each for the creeks and one each for the recreation reserves. The posters included the plans, plus key points. They gave details on how to give feedback and also advertised the Listening Posts.
- A major mail out was done. This included sending an A3 brochure to around 1800 Jan Juc and Torquay householders living within about 500 metres of the creeks. Brochures were also sent out to key stakeholders. The mail out was timed to maximise interest in the Listening Posts.

Path between Domain Road and Torquay Boulevard

1.8 Status of the Report

The MMP will form the basis for briefs for future detailed design, documentation and construction projects. It will also guide community interest groups with a strategic and informed process for their volunteer projects (e.g. revegetation projects).

The MMP also makes recommendations for public art and/or interpretation projects, and will act as a background document for project briefs that may be undertaken.

Other MMP components, such as the materials palette (planting lists, landscape materials, etc.) and management imperatives will be useful tools for development of an overall 'language' and distinct character for the site, and ensure a legible and coordinated design philosophy. Such recommendations may be considered within future Design Guidelines in adjacent developments and made available in other ways to developers in future if required.

- Listening Posts were held on Sat 3 March at the pavilion at Bob Pettitt reserve in the morning and Spring Creek reserve in the afternoon. People attended at both of these sessions to give feedback and also to ask questions.
- Reminders to submit feedback went via email or phone message to key stakeholders two weeks before close date.
- It should be noted that all forms of providing feedback were received. The majority came as emails, however, phone submissions, written and in person submissions were also received.

A summary of the community feedback was provided to the Project Steering Group who provided further input and made recommendations on changes to be made to the documents. The Project Reference Group also discussed the feedback and the response of the Project Steering Group and made their own recommendations. These recommendations were then presented to the SCS council who approved the changes to be made.

Landscape Master Plan

2.0 Landscape Master Plan

2.1 Overview of Existing Landscape Site Characteristics (Desktop and Site Assessment)

2.1.1 Land Use

The linear corridor supports largely passive recreation activities including walking, picnicking, children's play and nature appreciation. The intermittent path network also allows for cycling in some areas and the whole length of the linear reserve is an all year off leash dog zone as per SCS dog regulations.

The reserve is constrained by residential development on both sides of the creek, and an active recreation reserve. A number of houses abut the reserve whereby the delineation of land ownership is at times unclear. In addition, the interfaces of private residential/public space varies between properties, with some positive transparent barriers, but the majority of residences are obscured. Some residents have added their own modifications to the reserve such as access gates, seats, planting, bridges and crossings.



Path near private space



Transparent interface between public and private space



Play equipment in Three Bridges Park



Resident modifications to the reserve

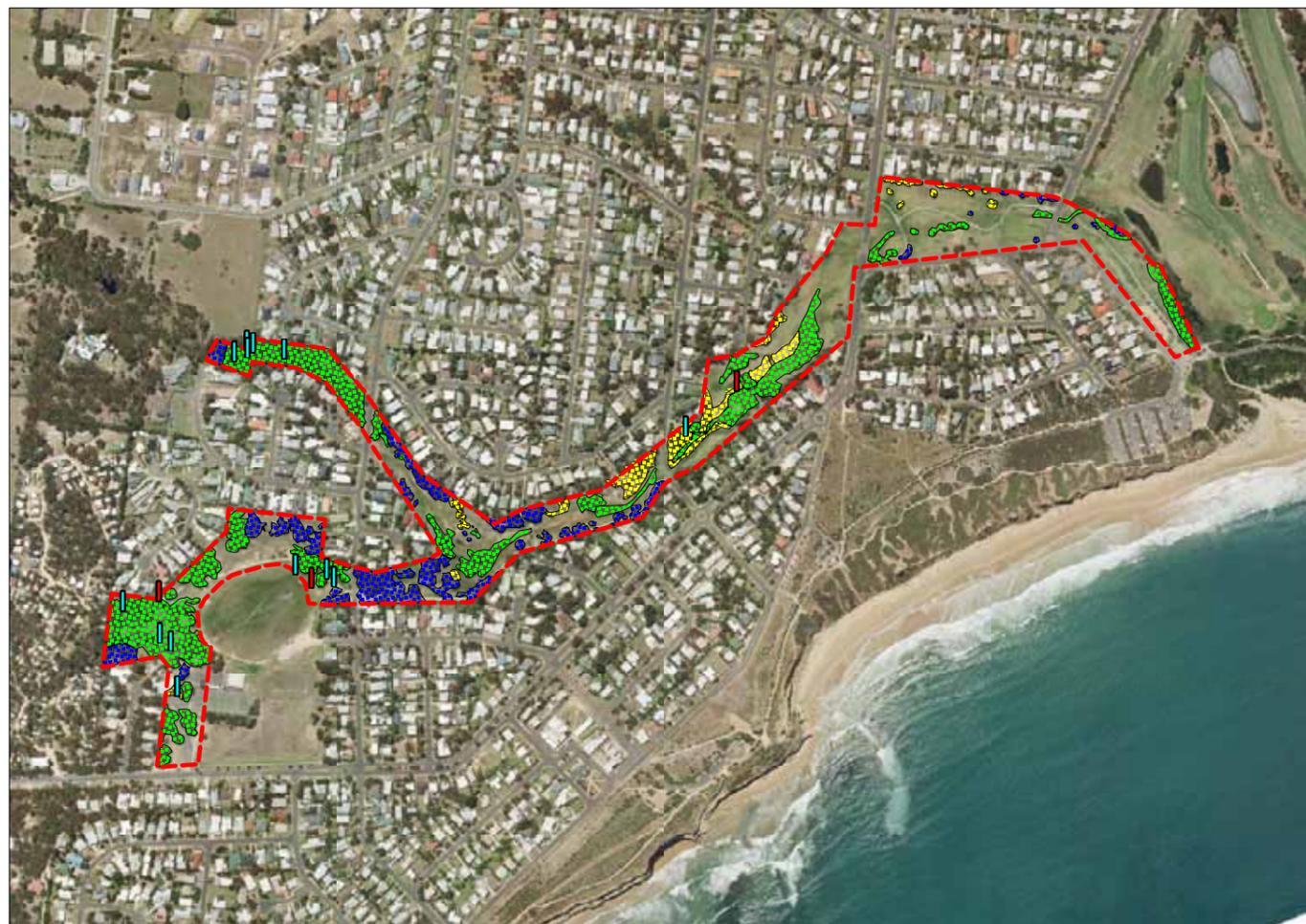


Figure 2a
Vegetation Mapping Overview
Jan Juc Creek
Beacon Ecological
Scale 1: 1,000

Extract from the "Vegetation Assessment of Jan Juc and Spring Creek, Jan Juc Victoria: EVC Mapping Assessment of Potential Net Gain and Landscape Planning Recommendations, Beacon Ecological 2009"

Legend

- Very Large Old Trees
- Large Old Trees
- Medium Old Trees
- Study Area
- Revegetation
- Remnant Vegetation
- Planted Non Native Vegetation

2.1.2 Vegetation Communities in and surrounding Jan Juc Creek

The vegetation communities along Jan Juc Creek have been heavily modified. DSE mapping indicates the complete absence of EVCs along the creek in the study area. A more detailed investigation by Beacon Ecological (2009), as shown in figure 2, identified a number of small patches of remnant vegetation in moderate to poor condition upstream of Torquay Boulevard. Vegetation includes isolated patches of Estuarine Wetland, Swampy Riparian Woodland, Plains Brackish Sedge Wetland, Plains Freshwater Sedge Wetland, Tall Marsh and Coastal Alkaline Scrub (Beacon Ecological 2009).

Much of the length of the creek lacks any aquatic and riparian vegetation, as much of the creek is now piped, while those areas that are more natural in structure are located in highly modified urban parkland.

The open waterway at the downstream end of the study site is dominated by Cumbungi (*Typha orientalis*), covering the width of the creek, offering no access to the creek and limiting fauna habitat and use of the creek. Fish surveys undertaken in this location determined the only native fish species present as eels and common jollytails (*Galaxias maculatus*).

Assessment of Potential Net Gain

Victoria's planning legislation governing management of native vegetation allows clearance of vegetation providing the loss in one area can be offset by the protection of vegetation in another. This process is part of the concept of net gain. This approach focuses on reversing the long-term decline in the extent and quality of native vegetation leading to an overall net gain. (For more information see *Victoria's Native Vegetation Management: A Framework for Action NRE 2002*)

Beacon Ecological (2009) assessment identified the potential additional net gain that could be achieved by protecting vegetation in Jan Juc Creek Reserve into the future. This means it could be used as an offset site if future works undertaken by Surf Coast Shire required the clearance of vegetation. In addition, Beacon Ecological (2009) identified that, through best practice management of vegetation in the reserve, the overall gain in the vegetation could be increased.

The study area provides some habitat for birds, amphibians and aquatic life. A number of species are threatened (and therefore protected by legislation under State or Federal Government acts) including Bibron's Toadlet (*Pseudophryne bibronii*), and various species of birds such as Lewin's Rail (*Lewinia pectoralis*), The Australasian Shoveler (*Anas rhynchotis*), The Eastern Great Egret (*Ardea modesta*), Musk Duck (*Biziura lobata*), Royal Spoonbill (*Platalea regia*), Nankeen Night-Heron (*Nycticorax caledonicus hillii*). Common Species such as the Short-Finned Eel (*Anguilla australis*) exemplify the study area's habitat value.



Phragmites australis in the Jan Juc Creek



Cumbungi (*Typha sp.*) in the lower reaches of the creek near the coast line



Scattered woodland in the north western end of the reserve

Native vegetation management

Protection, enhancement and reestablishment of native vegetation is a key focus of the management activities to be undertaken across Jan Juc Creek Reserve. Currently the remnant vegetation is limited to the reserve above Domain Road and the lower estuarine section below Hoylake Road. There are also some pockets of aquatic vegetation in the lower parts of the reserve.

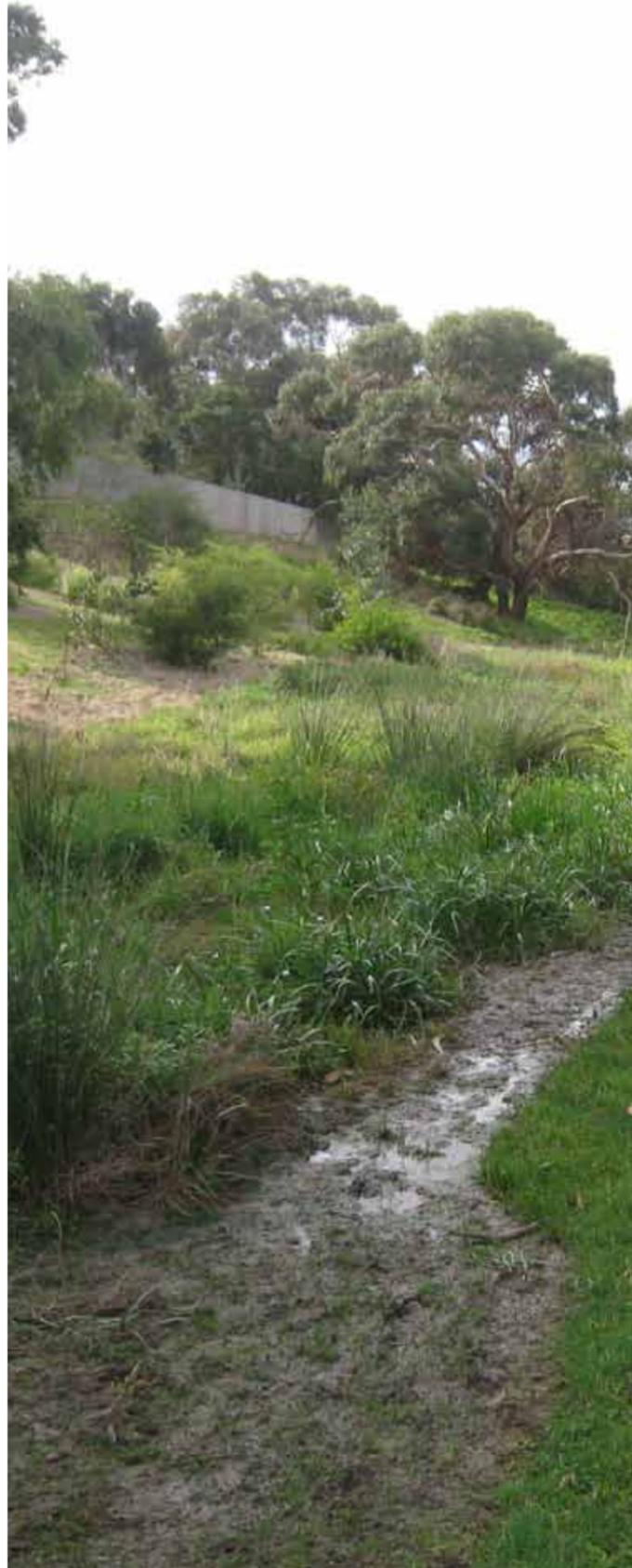
As a priority, future vegetation management activities undertaken by Council should focus on the protection and enhancement of the existing remnant vegetation in Jan Juc Creek to maintain and improve the overall condition of the Ecological Vegetation Classes present. This can be achieved through a reduction in weed growth and use of supplementary planting of understorey species to maintain and improve the overall condition. Future revegetation should be compliant with the relevant benchmarks identified for each vegetation class. Restoration efforts of native vegetation in other parts of the reserve should continue to increase the quality and extent of vegetation in accordance with appropriate EVC benchmarks.



Open water near Domain Road



Re-vegetation



Muddy edges to creek alignment

2.1.3 Soils

The SCS's Soil Type Zones mapping data (Maher and Martin Survey 1987) states that the soil type based upon landform is "low hills". The Department of Primary Industries (DPI) online resource defines this as soil/landform unit 158, within the Corangamite Soil Group, of the Corangamite Region. In brief, soils within the valley of Jan Juc Creek comprise of the following:

- Upper slope - Brown texture contrast soils, coarse structure. Dispersible subsoils receiving seepage water are prone to gully erosion, slumping and rilling. Surface texture of fine sandy loam with low permeability.
- Middle slope - Calcareous clay and deeply weathered limestone. Yellow-brown calcareous sodic texture contrast soils, coarse structure. Surface texture of fine sandy loam with moderate permeability.
- Steeper slope - Red calcareous gradational soils. Steeper slopes are prone to sheet erosion. Surface texture of fine sandy clay loam with high permeability.
- Lower slope and drainage line - Brown, grey or yellow sodic texture contrast soils. High dispersible subsoils are prone to gully erosion and tunnel erosion. Surface texture of loamy sand with moderate permeability.

(Source:25/09/2011 http://www.dpi.vic.gov.au/dpi/vro/coranregn.nsf/pages/soil_landform_units158)



Open space with grouped plantings of trees and shrubs



Degraded and eroded soils adjacent paths at Bob Pettitt Reserve (adjacent the JJCLR study area)



Tracks form through repeated use adjacent barriers



2.1.4 Water Environment

The drainage of the Jan Juc Creek catchment is currently managed by a relatively small underground drainage infrastructure that runs through the length of the reserve with a range of pipes draining the urban areas to the north and south of the reserve. Under high flow conditions, the system overflows into the overland flow path of the creek reserve.

Community consultation undertaken during the project identified a desire by some members of the community to reinstate sections of the creek to a more natural state by removal of underground drainage infrastructure and recreating the creek channel (day lighting), particularly between Domain Road and Torquay Boulevard.

Directions for the future management of the creek are guided by the desire to have a landscape that balances the social needs of the local community with protection and enhancement of environmental values.

The future form of the waterway, in addition to the guiding principles, includes consideration of site drainage, anticipated use of the reserve, protection and enhancement of remnant native vegetation, and the environmental benefits of reinstating the creek.

The focus for the water environment will be to enhance the biodiversity value of the creek by defining the overland flow path through planting native vegetation and the creation of seasonal billabongs in areas of periodic inundation.

Daylighting Jan Juc Creek

Reinstating the creek channel between Domain Road and Torquay Boulevard (and beyond) is considered a possibility subject to further detailed study, some determining factors include;

- The current stormwater main running from Bob Pettitt Reserve is only 375 mm and is in need of replacement as the drainage into it is exceeding its capacity. The pipe drain joining it from the northern arm has a general diameter of 450 mm. In the section between Domain Road and Torquay Boulevard, there are six stormwater branches that discharge to the stormwater main with pipe sizes as high as 750 mm.
- Day lighting the existing pipe drain along the linear reserve would expose a number of connecting pipe drains in a range of sizes from the surrounding urban

Phragmites sp. in the creek alignment

area. Current practice is to avoid installing grates at the end of pipes as they are a health and safety hazard. This may create a significant additional hazard into the reserve.

- The environmental benefits are relatively limited. The area for fish passage is relatively minor. Pipe work under the Bob Pettitt Reserve provides a permanent barrier to upstream fish movement.
- The northern arm is relatively steep and therefore there would be additional issues, with erosion requiring significant engineering structures if the stormwater was instead conveyed in an open channel.
- In terms of current best practice it would be recommended to open as many sections of the creek as possible.
- A study should be undertaken to determine the viability of this scenario and subject to the outcome of this study, further community engagement would be required.

The riparian zone of the creek has been highly modified containing limited areas of remnant native vegetation, manicured grassed areas and urban parkland. Some sections at the upstream end of the study area provide opportunity for enhancement of natural values, while the most downstream section could be enhanced through improvement of the natural diversity of the area.

Future management should focus on the following areas:

- Improving the condition of vegetation communities in and surrounding the creek;
- Management of pest plants and animals;
- Definition of areas and patterns of use;
- Managing upstream catchment influences on the creek;
- Minimising degradation of the open channel in the upper areas of the study area; and
- Reducing nutrient inputs.

Environmental Flows in Jan Juc Creek

Jan Juc Creek is an unregulated waterway in that it does not have a large dam located in the upper reaches of the creek that regulates the flow in the creek. The upper catchment of the creek above the study area has a range of catchment and on-stream dams. There is a single commercially-licensed dam in the upper reaches of the catchment as part of the water allocation for the RACV Resort Golf Club.

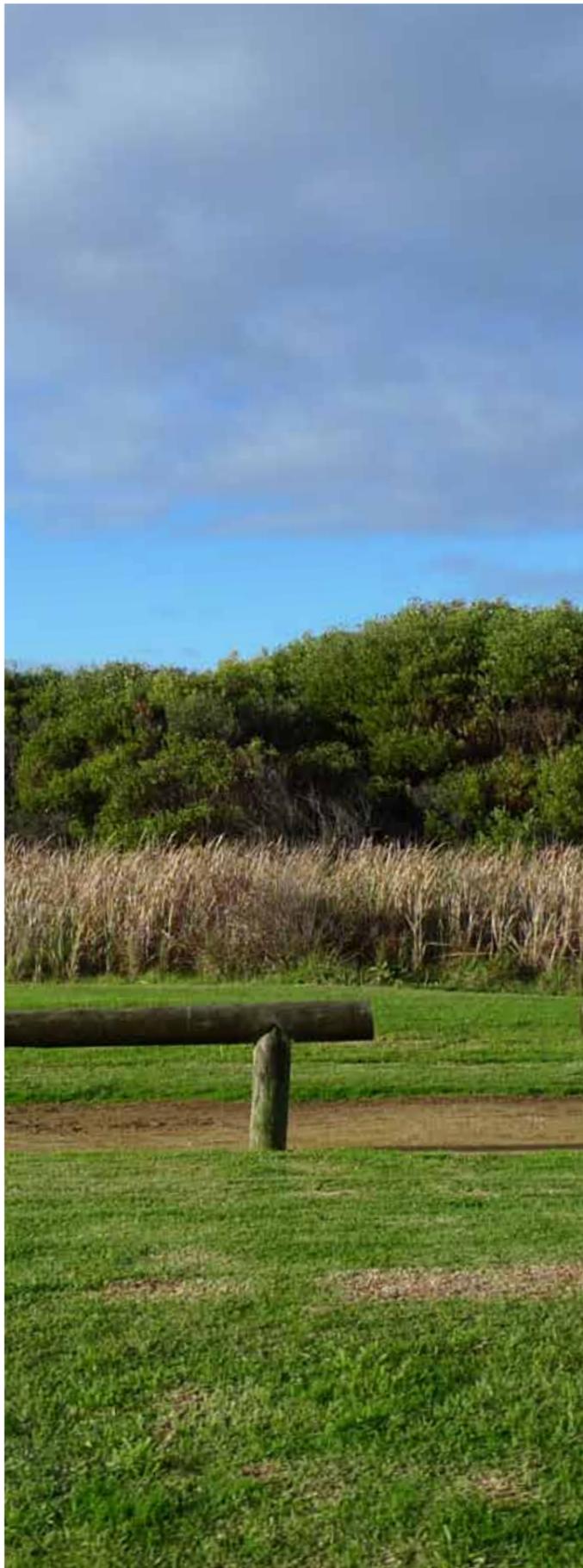
Water modelling undertaken on behalf of Surf Coast Shire has identified catchment dams in the upper catchment of Jan Juc Creek, combined with the allocation from the RACV Resort Golf Club, are impacting flows in the lower reaches of the creek during the summer period.

Options for management of catchment dams in the upper catchment are limited. Revision of legislation relating to catchment dams requires registration of household dams in Rural Residential Zones or rural zones on properties less than 8 Ha in size. Creation of new dams or alteration of existing dams in these areas also requires registration with Southern Rural Water. This allows the water authority to assess the proposed size of the dam to assess if the size is consistent with reasonable use of the water.

For dams on waterways, a water licence is required and one of the usual licence conditions is for the dams to provide a passing flow during the summer period. This requires flows that may enter the dam from the upstream catchment to be passed through the dam and continue down the waterway. In ephemeral systems such as Jan Juc Creek there are often limited flows during the summer period.



Storm water pipe outlet in the northern end of the reserve



Apex Park, massed groupings of plant species

2.1.5 Landform and Landscape Character

Landscape character of the JJCLR transitions from scattered woodland in the western end, to the dominant open modified parkland with clusters of vegetation, to brackish in the lower reaches. Scattered woodland exists in the northern arm from Domain Road and exhibits dense vegetation, primarily *Eucalyptus sp.* with scattered understorey. The seasonally inundated creek bed runs to the southern edge and there are abutting residential houses, with many houses having open interfaces to the reserve.

The dominant landscape character of the reserve exhibits modified park land with clusters of vegetation from Domain Road to Hoylake Avenue. The eastern end of this region exhibits denser vegetation (near Domain Road) within narrower sections of the reserve. Long vistas are common as well as more enclosed and framed views in close proximity to residential houses with varying interfaces. Boggy areas are also present with a wide expanse of vegetated creek (*Phragmites sp.*), in itself contributing to the natural beauty of the local area and telling a story about the landscape. Further east the landscape character becomes more modified, with large grassy open spaces and less vegetation. This area, particularly between Duffields Road and Hoylake Avenue, reflects a picturesque character with long undulating vistas, meandering paths and timber bridges. Residential houses in this area are also separated by streets, giving a sense of openness.

The eastern region of the reserve is largely associated with the creek, exhibiting brackish character and open space. The eastern end is on flatter open plains, while the topography in the western region reveals undulating hills.

The key landscape character zones have been outlined below. Landscape treatments within these zones are addressed in section 2.2.

1. Bob Pettitt Recreation Reserve - the western boundary of the study area along Jan Juc Creek from Sunset Strip to Wattle Court, and Wattle Court to Domain Road – managed woodland and parkland edge, with character dominated by mature woodland varying from open to dense along the riparian zone.
2. Delview Court to Domain Road – open woodland dissected by (in parts) steep embankments of the drainage line.
3. Domain Road to Torquay Boulevard – managed parkland (linear reserve) and open parkland (northern

arm) dominated by a vegetated ‘swale / drainage’ line.

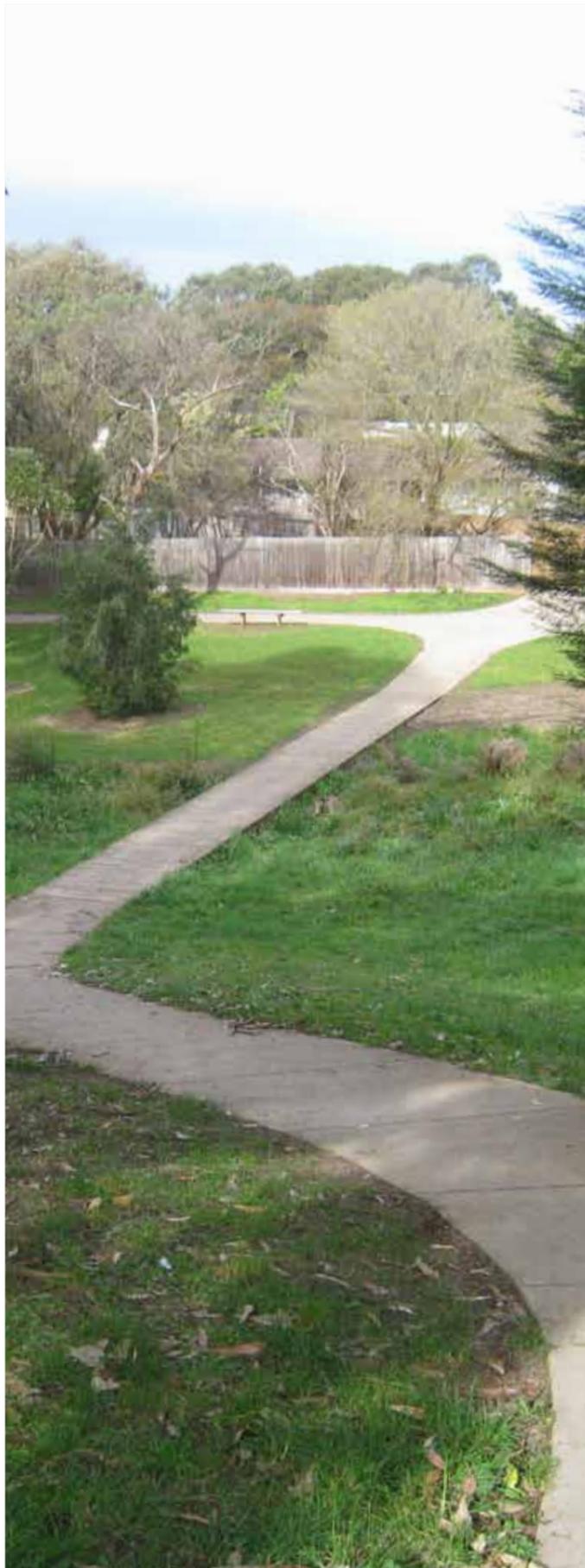
4. Torquay Boulevard to Duffields Road – parkland to the southern side of the creek, open parkland to the north. The character of this area is dominated by the densely vegetated drainage line to the west and the open grassed and reedy drainage line area to the east.
5. Duffields Road to Hoylake Avenue (Three Bridges Park) – grassed parkland with occasional small groupings of medium trees. This area is dominated by the central, winding, sealed path and three timber bridges. The drainage line is read as a depression and is secondary to the path/bridge system. It also provides an activity ‘hub’ incorporating a playground, sheltered BBQ, seating



Picturesque character of Three Bridges Park



Open modified parkland with clusters of vegetation



Existing bridge, crossing Jan Juc Creek.

and an ad-hoc off street car parking area with difficult access (this area is not a designated car park).

The open character of this area offers an opportunity to strengthen its ability to facilitate diverse activities through interpretation of spaces, providing a strong sense of place and unifying the site through selective built elements and soft landscaping. It offers excellent visibility (and therefore community safety) throughout the site due to the topography and open nature of the zone, proximity of path and road networks, and some well needed shaded areas.

6. Hoylake Avenue to the access road to the Surf Life Saving Club (Apex Park) – grassed with a gravel path to the eastern boundary, few scattered trees. This area is dominated by long views over the RACV Resort Golf Course to the east, the reed vegetated creek line and gravel car park to the south. Views to the coast are restricted by coastal scrub to the south. In summer this area is dominated by overflow car parking.



Varying interfaces of residential houses with the reserve



Limited parking along Carnarvon Avenue

2.1.6 Open Space and Recreation

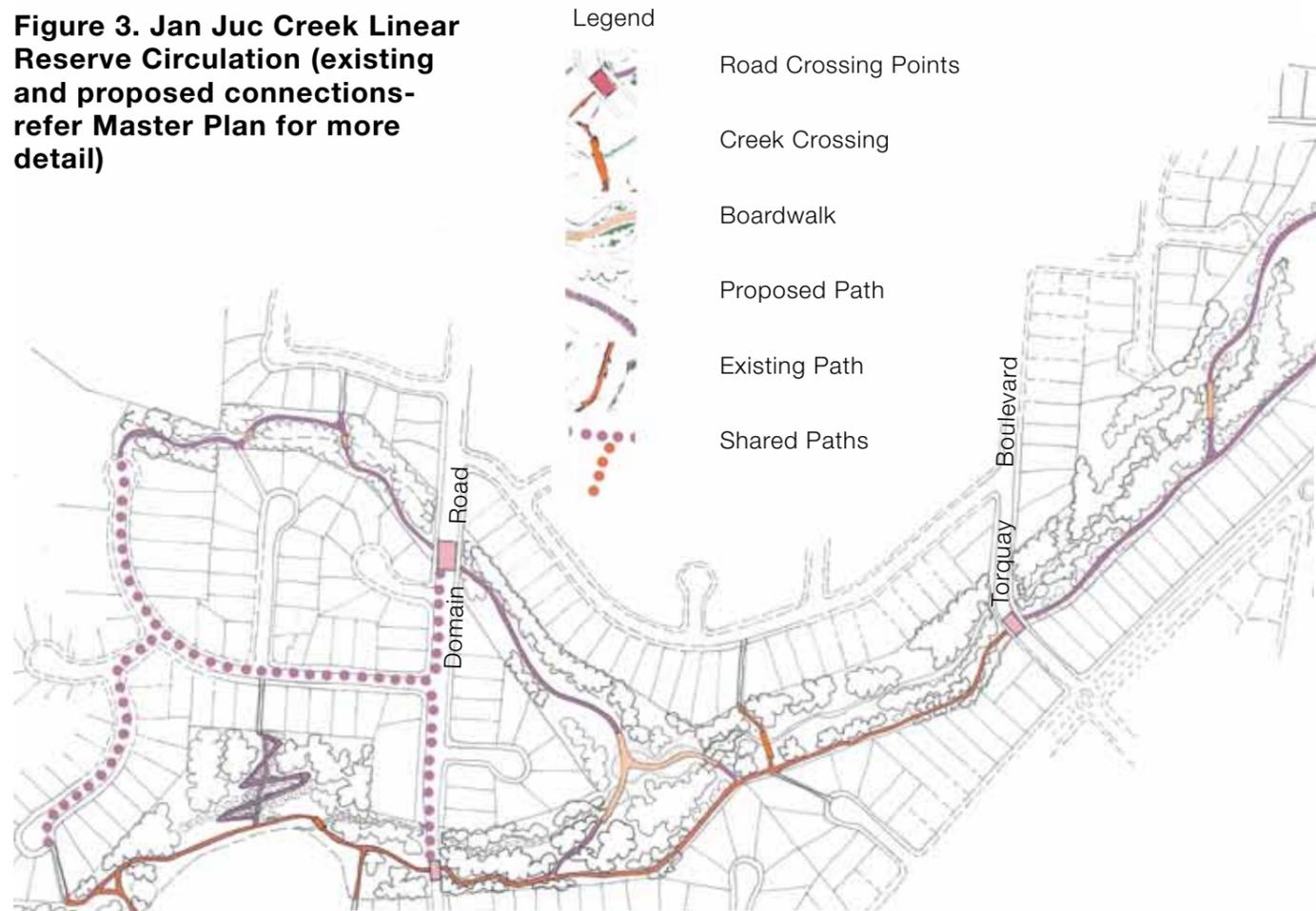
The site's boundary is blurred at its interface with Bob Pettitt Reserve at the southern side of the western end of the JJCLR where the two spaces meet. This allows the more structured elements of Bob Pettitt Reserve- including a sporting oval, soccer pitch, playground, basketball area, tennis courts, cricket nets, club rooms and skate boarding area- to borrow from the open and informal aspects of the creek reserve. There is also an intermittent path network that runs through various sections of the reserve, which allows passive recreation such as walking and nature appreciation. Within the reserve there are many large areas of open space/ modified parkland, which offer space for picnics and more active recreation including cricket or ball games.

The JJCLR also benefits in having a variety of open views as well as filtered and protected vistas. The eastern section of reserve from Duffields Road also has children's play equipment, and various landscape furniture, such as shelters, seating and a barbeque. This interface is in contrast with the eastern end of the JJCLR and Apex Park, where the linear reserve borrows vistas from its neighbouring open spaces, including the RACV Resort Golf Course, to offer expansive views of the landscape beyond and views to the dunal vegetation and estuarine environments.



Varying interfaces of residential houses with the reserve

Figure 3. Jan Juc Creek Linear Reserve Circulation (existing and proposed connections-refer Master Plan for more detail)



2.1.7 Access and Connectivity

Currently, site access and connectivity are challenged by a variety of factors including: fencing; site topography; path surfacing; informal creek crossings; encroachment into public open space; areas of inundation; and dense vegetation. The study area affords accessibility and connectivity via:

- Road – the Surf Coast Highway (to Geelong regional centre 20km) and the Great Ocean Road accessing the Surf Coast to the south. From the highway, the Jan Juc Creek Reserve can be accessed via Duffields Road and four more intersecting roads, which include Hoylake Avenue, Torquay Boulevard and Domain Road. However, there is limited parking, particularly along Carnarvon Ave where access to the playground is required.
- Public transport – it is possible to visit the site via the public bus (route 74) on the Great Ocean Road, which stops along Duffields Road, Sunset Strip and Domain Road, and connects with train services from Geelong to all major Victorian destinations and regional centres. Other bus services provide buses to all coastal towns including connections with the Queenscliff-Sorrento ferry service. However, access to such resources from the north west of the site is difficult. Refer to Figure 4.
- Non-motorised transport modes (cycling, walking, dog walking, etc) to a range of local natural and recreational sites, including the coast, are possible via an intermittent trail network. Some paths connect to the JJCLR between properties and, once within the reserve, the paths vary from 'goats trails' and gravel paths to formed hard surfaces such as concrete footpaths. The SCS produced a pathways strategy in 2006



Bridge crossing in Three Bridge Park



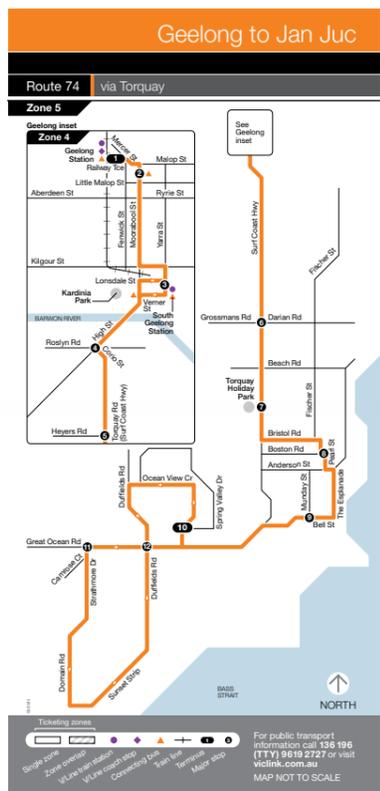
Resident-made bridge



Resident-made bridge

Figure 4. Bus route through the study area, source:

<http://www.metlinkmelbourne.com.au/route/view/5005>



Access to the reserve between houses



Intermittent network of paths in the reserve

and aims to achieve greater local connectivity across the shire (The Jan Juc Creek Circulation Plan, which is based on this overall pathways strategy). This is currently under review and out for public consultation. Creek crossing points exist in a number of locations within the reserve, particularly near Duffields Road, and also resident-made crossing points in the western region where it divides into the northern and southern arms of the reserve.



Scattered woodland provides immediate views

2.1.8 Views

Views vary according to the local topography, nature and maturity of the vegetation in terms of intimate or long vistas. Scattered woodland vegetation in the north west region tends to restrict views, whilst the open woodland areas downstream afford long open views of parkland. A point that offers elevated observation and longer views is from the playground area on Carnarvon Avenue looking in either direction along the open space.

Views of running or open water of the Jan Juc Creek are largely constrained by aquatic vegetation or by virtue of the creek being contained within the underground pipe network.

Views into the site are occasionally limited by a combination of topography and 1.8m height paling fences to private property boundaries adjoining the site. Longitudinal views are filtered and varied within the diverse woodland and parkland characters of the site.

2.1.9 Cultural Heritage

The western end of the JJCLR on the Bass Strait coastline is the only section of the reserve with a cultural sensitivity overlay, included in the Department of Planning and Community Development's (DPCD) **Aboriginal Heritage Act 2006 Areas of Cultural Heritage Sensitivity in Victoria** (Geelong) (Department of Primary Industries, 2011).

There are no heritage places listed on the Victorian Heritage Data Base located within or in close proximity to the reserve. Any future works that disturb the surface levels should be preceded with site-specific cultural heritage studies.

2.1.10 Climate

JJCLR is in a mild temperate zone. Winters are generally mild to cool with low humidity, often with coastal winds and driven rain. Summers are hot with moderate humidity and high bushfire risk. Rainfall is approximately 650mm per year. While there are micro-climatic nuances along the length of the reserve, any proposed vegetation will need to be able to tolerate these conditions, in addition to some coastal exposure.

2.1.11 Fire

The Jan Juc and Bellbrae Community Preparedness Guide and Response Plan details the risks and strategies for fire prevention, risk reduction and how to respond in case of a bushfire. This plan broadly relates to the Jan Juc and Bellbrae region while SCS has yet to undertake a Fire Management Plan for Jan Juc Creek Linear Reserve. It acknowledges that a fire management plan and strategy may need to be prepared for JJCLR over time and in accordance with AS3959-2009 Construction of buildings in bushfire-prone areas.

The **State of Preparation Report** (2009) by the Victorian Government identifies Jan Juc as one of 52 towns near bushland considered at the highest risk of ember attack. A Township Protection Plan has been developed by the Country Fire Authority (CFA). As part of the plan, the CFA's **Community Preparedness Guide (2010-2011)** for Jan Juc and Bellbrae identifies the Jan Juc Creek area as having a 'very high' bushfire risk. The area has/is:

- a significant number of both permanent and seasonal residential dwellings in the path of the north easterly and north westerly wind, which in a fire situation could pose a risk of ember attack to buildings;
- a major tourist location;
- fuel loads and types vary from areas of urban conditions through to heathlands, grasslands and areas of stringy and iron barks; and
- varying topography and aspect.

Bob Pettitt Reserve in Jan Juc is identified as the local 'neighbourhood safer place/place of last resort'.



Friends of Jan Juc Creek Information Signage

2.1.12 Landscape Elements

Landscape elements, including site furniture, signage, bins, play equipment, BBQs etc, are currently limited and lack uniformity or consistent language or materials or design. These elements include:

- Benches and seats.
- Two shelters.
- Signage at entry points.
- Car parking: non-designated near play area on west end Carnarvon Avenue; gravel car park at the eastern end of Carnarvon Avenue.
- Removable bollards, safety bollards/fence.
- Bridges and creek crossings.
- Road crossings between reserve areas, including bicycle holding rails.
- Fencing: a wide variety of boundary fencing styles by private residences.
- Infrastructure access points and elements such as pit lids, grates and safety rails.



Existing seating in the reserve, near Domain Road



Existing shelter in Apex Park



Bicycle holding rails and tactiles



Sewerage infrastructure in the north western end of park



Existing shelter, bbq, play equipment and informal parking



2.2 Master Plan Proposals

Where relevant, the following Master Plan recommendations are depicted on the Jan Juc Creek Linear Reserve Master Plan on page 24.

The SCS style guide has been incorporated within the following sections of the report (interpretation, public art, pathways, hard landscape materials, protection and enhancement of native vegetation).

2.2.1 Vision

The vision for JJCLR has been derived through an understanding and analysis of the site, background reports, studies, SCS strategies, feedback from community consultation, PRG and PSG guidance.

The vision is to enhance the linear open space that is accessible to all and to strengthen ecological values, maintain a healthy waterway and achieve a balance between the environmental and social values of the community.

2.2.2 Guiding Principles

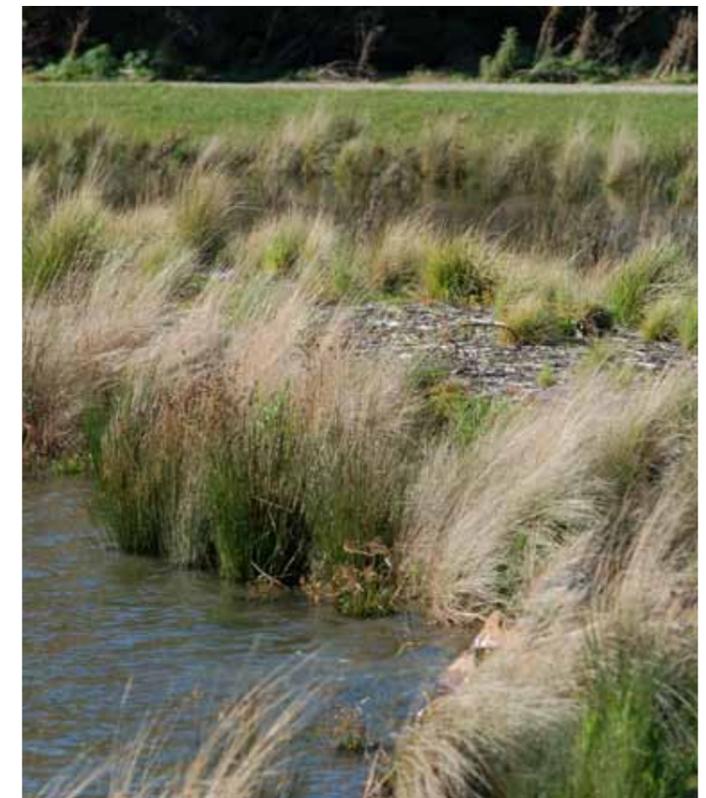
In accordance with the project brief, SCS guidance, responses from community consultation and input from the PSG and PRG groups, the following landscape design principles have been applied in preparing the Landscape Master Plan.

Key principles include:

- Establishment of a landscape that balances social needs of the local community with protection and enhancement of environmental values.
- Articulation of the Jan Juc Creek through landscape responses, thereby reinforcing a sense of place.
- Enhance the existing variety of recreational opportunities/spaces with consideration for appropriate facilities within public open space.

Healthy waterway (precedent image)

- Provide an accessible public realm for all, with linkages between key destinations and across the creek at accessible gradients, tactile indicators and ramps where required. Pathways are to conform to the existing SCS pathways strategy guidance.
- Consolidate car parking efficiency within peak summer periods, and at key urban parks and community facilities, while incorporating landscape elements for 'all year round' user amenity.
- Signage 'language' - directional, informational and educational within the parameters of the SCS Signage Style Guide to strengthen site legibility and maintain a sense of continuity throughout SCS open spaces.
- Appropriate landscaping of the study area in response to the site's location within a high risk fire zone.
- Enhance the strong local identity and existing landscape character while recognising the need for practical considerations (maintenance, community aspirations, connectivity, social/recreational needs, fire prevention, crime prevention through environmental design, material selection).
- Water Sensitive Urban Design (WSUD) and stormwater management initiatives conforming with Melbourne Water guidelines and best practice.
- Enhance and protect sensitive vegetation areas and the biodiversity of the linear corridor.
- Investigation of flood and waterway management strategies as well as community safety, river health, ecological values and water quality.



Riparian planting and grassed open space example



2.2.3 Landscape Character and Visual Quality- a strong local identity

The existing landscape character is varied and diverse, from areas with remnant vegetation through to highly modified landscape and aquatic systems. The visual quality of the site is highly valued by the local community and the Landscape Master Plan aims to respect these qualities whilst identifying opportunities to enhance the quality of the spaces and characteristics already present.

The Landscape Master Plan recommends:

- Enhancing the sense of local landscape identity by using indigenous plants, local materials and sympathetic finishes that are considerate of the local environment – upper creek reaches (woodland) and lower creek reaches (coastal margins).
- Vegetation will be managed through weed removal and enhancement of stands of indigenous and remnant vegetation to enrich the existing linear reserve characters, ecological and environmental values in accordance with the recommendations of the Beacon Ecological Report “Vegetation Assessment of Jan Juc and Spring Creek, Jan Juc Victoria: EVC Mapping Assessment of Potential Net Gain and Landscape Planning Recommendations”.
- Involve the local Wathaurung representatives, community and friends groups in revegetation, habitat care and ongoing landscape maintenance through the development of a sense of ownership, collaboration, inclusion and in accordance with the Master Plan.
- New facilities will be sensitively located and reinforce a sense of place through a coherent and unified ‘language’ of design style, materials and finishes.
- Drainage issues will be addressed through additional civil drainage and local drainage works along with planting and stabilisation in order to improve the quality of areas affected by erosion.
- Iconic landscape features will be preserved and enhanced through framing views to significant features (e.g. parts of the creek itself, mature trees, key views, sense of place).

3 bridges park along Carnarvon Avenue

- The scale, mass and layout of vegetation will reflect the character of the site, which varies from woodland, wooded parkland, open parkland and activity nodes.
- Planting and landscape treatments are to be balanced with provision of a legible and safe open space.
- The suggested landscape materials palette has the ability to accurately reflect local character, enhance its quality and amenity over time, unify spaces and the reserve itself, and create a sense of place. Aspects of this palette will be identified and detailed in future detailed design phases.
- Highlight views throughout that provide visual links, between, into and out of the linear reserve. Avoid obstruction of views into key recreation areas and ‘activity hubs’ by restricting car parking and screen planting along roadways surrounding the reserve.

Landowners should be encouraged to consider planting along boundaries to soften the appearance of any fencing or as an alternative to fencing to define the property boundary. Minimise fencing to encourage a broader ‘feeling’ of space and to improve safety through ‘eyes on the park’ passive surveillance.



Open space provides places for picnics and active recreation



Long vistas in areas in between Domain Road and Torquay Boulevard



View along Carnarvon Road look looking across Three Bridges Park



Existing bollard in access track
Existing timber seat adjacent path

2.2.4 Public Open Space (POS) and Recreation

The majority of POS within the site will provide for passive activities including walking, nature appreciation, picnicking, etc with specific smaller areas or 'activity nodes' (BBQ, play grounds, shelters) that respond to particular community needs.

Bob Pettitt Recreation Reserve offers more active interaction with the open space and delivers a number of active recreational opportunities. The combination of recreation activities enhances the experience for users of both Bob Pettitt Reserve and the JJCLR.

Passive Recreation (Site-Wide Generally)

The Master Plan aims to respond to community and SCS directives to articulate a healthy balance between passive recreational uses and the environmental value of the creek and JJCLR. Existing facilities and uses will be augmented, with some new strategically placed facilities proposed to play an important role in supporting community interaction, providing passive surveillance and facilitating community education about the natural and cultural environment.

Throughout the study area, passive recreation landscape elements will comprise a variety of proposals including:

- An improved shared pathway network (as outlined in the Master Plan) and access for all, site-wide with particular consideration for road crossings.
- An interpretation and signage strategy site-wide.
- Managed access to the creek line via an integrated boardwalk crossing at the convergence of the linear corridor and the northern arm of the study area, and additional informal play features via rockwork and planting within the creek line at Three Bridges Park.
- Provision of strategic framed views through vegetation.
- Additional resting elements (seats/benches) as shown.
- An interesting journey through the reserve that tells the story of the transition from upstream woodland through to the coastal margins along a riparian linear corridor.

- Biodiversity would be considered through plant selection and placements and balanced with fire risk considerations.
- Management of existing significant mature vegetation and implementation of an indigenous tree replacement strategy is recommended site-wide.
- Weed management is recommended site-wide to enhance biodiversity values and to reinforce the indigenous landscape character.



Existing pedestrian road crossing



Existing residential fencing