



Spring Creek Linear Reserve

Master Management Plan Report

Adopted 27 June 2012

Revision I

Spring Creek Linear Reserve Master Management Plan Report

Prepared by: GHD for the 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 Spring Creek Linear Reserve Master Management Plan Report forms part of a suite of documents comprising the following:

- Spring Creek Linear Reserve Master Plan
- Jan Juc 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 Spring Creek Linear Reserve provides a strategic direction for long term development, environmental health, protection, and maintenance works of the reserve and of the Spring Creek.

The reserve contains high significance remnant aquatic and terrestrial vegetation of moderate condition. The presence of these communities has created a template for recreational activities conducted in and around the reserve, such as passive and active recreation, links between Torquay, Jan Juc and the coast, and specific use active recreation spaces.

The Landscape Master Plan is a vision for the linear open space, while the Management Plan specifically considers asset management, river health and waterway management. The recommendations have been summarised, budgeted and prioritised.

Some key findings of this report are:

- The desire to retain and enhance the existing natural values, whilst providing an accessible reserve for the local community implementing specific recreation opportunities, without impact on the natural values.
- The input of the Project Reference Group and Project Steering Group provided a comprehensive understanding of the issues relating to this project, including future aspirations and consideration for development to the north of the upstream section of the creek.
- The existing site characteristics are unique and the juxtaposition of the two distinctly different ecologies helps define the landscape character. These 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:

- Site-wide accessibility
- Bridge creek crossing points, and
- Retention and enhancement of the 'natural' and local character.

Key Master Plan recommendations include:

- Enhancement of existing recreation areas and inclusion of complementary elements as well as infrastructure, such as formal parking and toilets at the bike park, additional fishing platforms, exercise fitness track and proposed playground.
- Provision of a 30m riparian buffer to the creek.
- Increasing accessibility in the public realm including new paths, boardwalks and bridge connections throughout the reserve, and between existing and future developments.
- Implementation of directional, informative, interpretive and educational signage along the linear reserve, and at key locations, communicating the importance of the creek's health, catchment, and the ecological and cultural values of the reserve, including artwork.
- A suite of elements (furniture, pavements and signage) that connects the disparate open space zones, through a uniform materials palette, while maintaining a respect for their unique characteristics.
- Contribute to the ecological value of the creek and linear reserve through revegetation, water sensitive urban design interventions, a new wetland and overall stormwater management.
- Provide a picnic area, upgrade parking and provide path linkages to Torquay, the Spring Creek Recreation Reserve and the Linear Reserve at Aurora Crescent.
- Investigate the use of alternative materials for paths more suited to the 'natural' environment of Spring Creek.
- The Aurora Crescent car park surface to be maintained as gravel and not asphalt.

- Final location of the Aurora Crescent bridge to consider the existing vegetation and Barwon Water infrastructure.

Key Management Plan recommendations include:

- Protection and enhancement of native vegetation is the priority focus for vegetation management activities undertaken across the reserve.
- High and very high conservation value vegetation will be permanently protected in the reserve.
- Future weed and rabbit management programs will be integrated with adjacent landholders and developers.
- Raising community awareness of the ecological, indigenous heritage and landscape management issues relating to the creek and linear reserve through the installation of signage and interpretive elements.
- Fire safety, public safety, accessibility and delineation of boundaries, including controlled access by vehicles and, in some areas, pedestrians.

Achievement of these recommendations is anticipated to be carried out over a ten-year time frame, 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, Rachel Brown, Leanne Lucas, Kevin Walsh, 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.

Project Steering Group members:

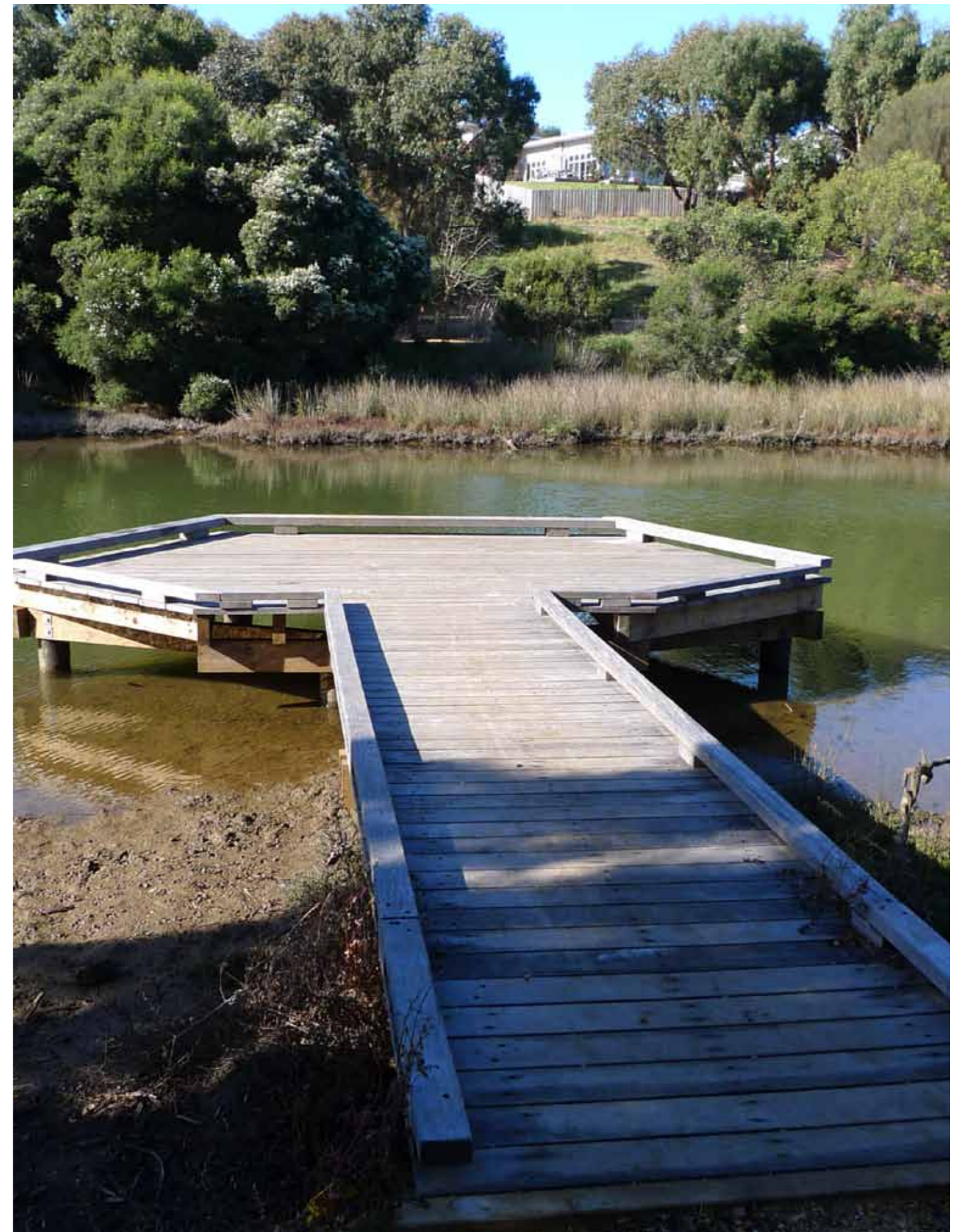
Cr Rose Hodge (Chair), Dr Bruce Van Every, Mr Greg Sharpley, Mr Sid Pope, Mr. Luke Hynes, Mr Tony Smales, Ms Margot Galletly and Ms Alison Watson.

Further information:

For more information on this site and its master plan contact Surf Coast Shire and speak to Coordinator Environment and Open Space.

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Fishing jetty

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 Classes
- FO - Floodplain Overlay
- 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
- SCLR - Spring Creek Linear Reserve
- SEPP - State Environment Protection Policy
- SCS - Surf Coast Shire
- WSUD - Water Sensitive Urban Design

1.0 Project Background

1.1 Introduction

The Spring Creek Linear Reserve (SCLR) is an important place of natural quality, beauty and human activities.

The SCLR Draft Master Management Plan (MMP) will deliver key outcomes for the community, including quality recreation and improved health opportunities, as well as meeting the environmental needs for conservation of natural assets in the reserve.

The draft planning process strives to achieve a balance between the uses and pressure on the reserve to ensure continued improvement in recreational opportunities and the protection and enhancement of the natural environment.

1.2 Brief

The Surf Coast Shire Council (SCS) engaged GHD in May 2011, to work with Council and the community to develop the Draft MMP.

The purpose of the plan is to develop strategic directions for long-term development, environmental health and protection, maintenance works and identification of opportunities.

The Draft MMP has been developed in consultation with the community, key stakeholder and SCS feedback. The MMP comprises:

- A Landscape Master Plan
- A Management Plan addressing key landscape, creek health and stormwater management issues, and
- Management recommendations including costing over a 10-year period.

It is envisaged that works may occur over a medium to long-term period.

The MMP is a phased planning process. At the time of writing this report, a number of components to support the design and documentation had been completed during June to November 2011 including:

- Invitation to community members to form a Project Steering Group (PSG).
- Invitation to Project Reference Group (PRG) members.

- Initial meetings with the PSG and PRG to outline the project parameters, agree on a consultation strategy, determine key project opportunities and constraints, and agree on a vision for the site.
- Site visits by GHD.
- Public consultation through a variety of media including: set up and monitoring of a 'Facebook Page'; ongoing engagement with the PSG; 'listening post' on site at Spring Creek Recreation Reserve during July 2011; 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 (e.g. Torquay Cricket Club, Torquay Football Club, Torquay Junior Football Section, Torquay Netball Club, Torquay Tennis Club, Torquay Scouts, Danawa Community Garden, Southern Rural Water).
- Documentation of an issues and opportunities discussion paper identifying a number of establishing principles, including known issues for each of the study areas and the opportunities that arise in addressing them.

A core objective of the brief is environmental protection and enhancement of the linear reserve in tandem with consideration of community values. In response, the following objectives have been considered as key elements of all design aspects for a sustainable, achievable and inclusive MMP:

Environmental

- Protect and enhance high conservation value.
- Protect and enhance significant terrestrial and aquatic habitat.
- Consider areas of upstream influence.
- Link with other potential green spines to promote corridors through urban development.
- Promote Environmentally Sustainable Design (ESD) for reserve facilities.

Social

- A place that integrates with existing and proposed surrounding areas.
- A place that is accessible to everyone.
- A community spine leading to/from other key community and natural facilities.
- A place with a natural amenity.
- A place that serves a community made up of a diverse range of people with differing needs and uses.

Economic

- Support and not detract from existing facilities.
- Revenue to assist with funding of key community aspirations for reserve facilities within the planning and management framework.
- Affordability – realistic options for implementation with consideration of SCS funding and community expectations.
- Consideration of parks and asset management facility and management life cycle costs.



Mature vegetation

1.3 Structure of the Plan

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

- Landscape (parks and open space use and amenity)
- River health (water quality and vegetation), and
- Stormwater and waterway management.

However, 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, existing 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, this MMP is presented in two key sections:

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

1.4 Study Area

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

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 Spring Creek study area comprises a mixture of Council freehold land and land in the process of being transferred from private to Council freehold land. There is a linear strip of Crown land along the creek length (bed and banks) for which the SCS is not the appointed Committee of Management.

The Spring Creek study area currently supports a mix of vegetation including remnant terrestrial and aquatic vegetation, planted indigenous vegetation, planted exotic vegetation and wetland areas.

1.5 Existing Information

Previous to the commencement of this project, Council has undertaken a number of studies that will serve to inform the MMP. These papers and information have been used as a basis to inform this report. In brief, these studies and data include:

- Mapping based on the type, extent and conservation significance of ecological vegetation classes (EVCs) for each reserve (Beacon Ecological, 2009)
- Cultural Heritage assessments
- Environmental Management Strategy 2006
- Surf Coast Pathways Strategy Parts A and B July 2006
- Surf Coast Shire Jan Juc Precinct Pathways Project
- Spring Creek Catchment Plan 2003
- Surf Coast Shire Draft Playground Strategy 2009
- Surf Coast Shire Parks and Reserves Asset Management Plan
- Surf Coast Shire Community Engagement Guidelines 2009.

- 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 (Beacon Ecological, 2009)
- Spring Creek Recreation Reserve Master Plan 2001
- Great Ocean Road Coast Committee Interpretation Action Plan 2009
- Surf Coast Shire Draft Torquay Bike Park, Spring Valley Drive, Torquay May 2009
- Surf Coast Shire Planning Scheme
- Surf Coast Shire Domestic Animal Management Plan 2008-2011
- All relevant Acts and Regulations
- Any other relevant documents, including planning documentation from the Surfviews Estate to the north of the study area.

Spring Creek

STUDY AREA

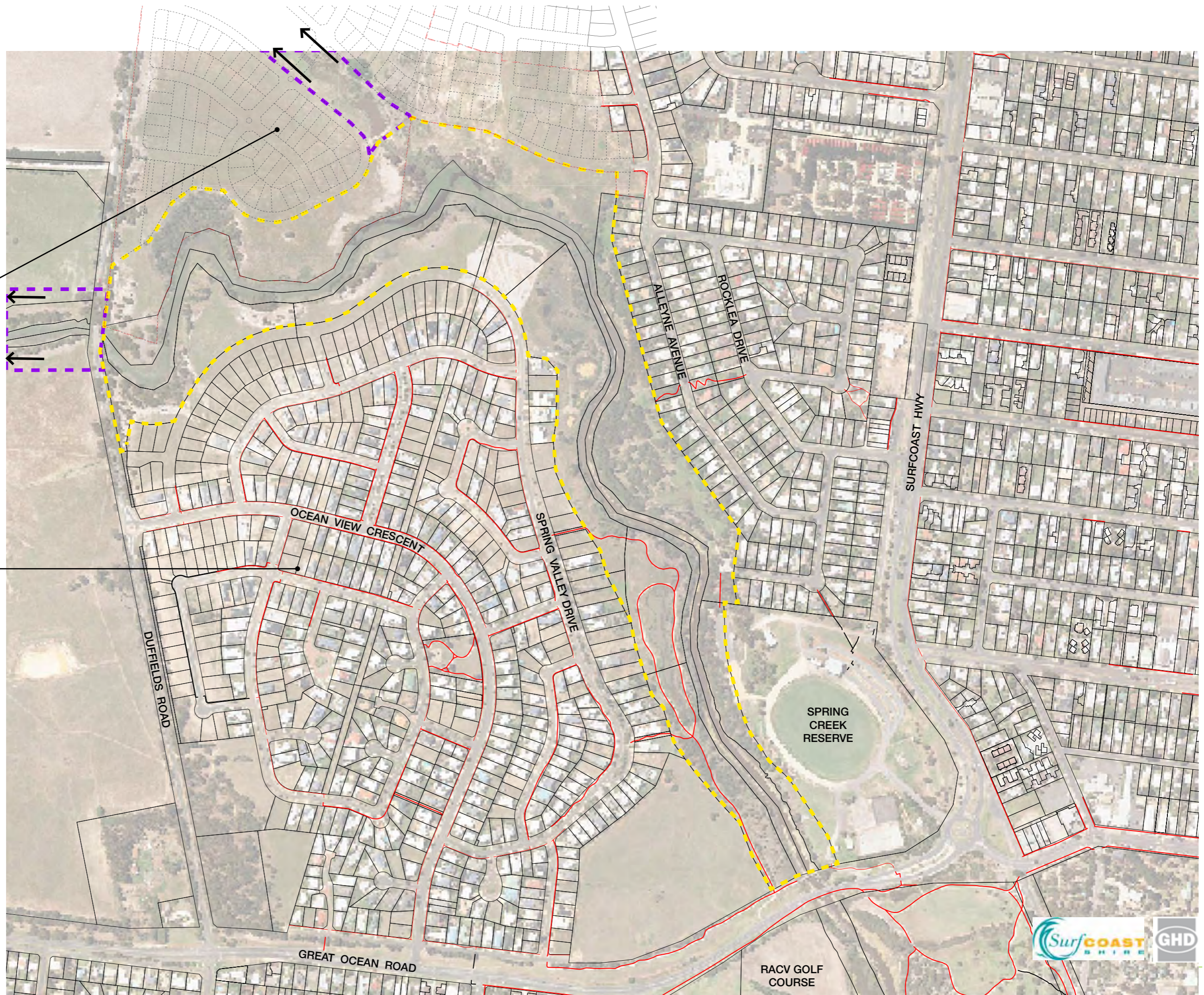
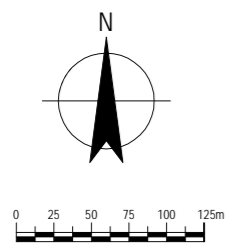
Study area boundary

Area of upstream influence

Surfviews Estate (proposed)

Ocean View Estate

Figure 1 Study Area Site Boundary










-  Study Area Boundary
-  Sensitive Cultural Heritage Area
-  Land Subject to Inundation (LSIO)
-  Environmental Significance Overlay (ESO1)
-  Flood Overlay (FO)

Figure 2. Location of Key Relevant Overlays and Areas

1.6 Planning Framework Outline

There is a number of existing planning frameworks that govern management of the reserve (Figure 2) in relation to activities that may be conducted within the SCLR, as outlined below.

Part of the study area is currently zoned Public Conservation and Resource Zone (PCRZ) while the remainder is Residential Zone (RZ1). However any RZ1 areas within the study area are currently being transferred to the SCS for rezoning why? The area is currently under a Design and Development Overlay (DD01) and a Development Plan overlay to the north of Spring Creek (DP05).

An Environmental Significance Overlay (ES01 - Wetland and Associated Dry Land Habitat Protection) currently covers the Spring Creek study area under the current Surf Coast Shire Planning Scheme. Much of Spring Creek is also covered by a Floodplain Overlay (FO) and the surrounds are covered by a Land Subject to Inundation Overlay (LSIO). Additionally, there are areas of Salinity Management Overlay (SMO) surrounding water treatment facilities (Surf Coast Shire Planning Scheme Online 2006a).



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.

Fishing jetty on Spring Creek

- 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.

1.8 Status of the Report

The MMP forms 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 and community (e.g. revegetation) 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 of adjacent precincts.

Within the study area to the north of Spring Creek, land ownership is currently with Surfviews Estate. At the time of writing this report, a planning permit had been issued, which directly impacts the outcomes of the project. Of particular relevance is the location, footprint of retarding basins/wetlands and integrated water management solutions for the development and the Spring Creek Tributary. The Master Plan makes broad recommendations for the land not under SCS ownership, but cannot directly enforce these solutions. This area will be designed by the developer, who will seek detailed design approvals from Council.

2.0 Landscape Master Plan

2.1 Overview of Existing Landscape Site Characteristics

2.1.1 Land Use

The current land use is for passive recreation and nature appreciation comprising walking trails (both formed and informal surfaces), fishing platforms, informal access to water and areas of public open space.

A bike park exists on Spring Valley Drive to the south side of the creek.

The linear corridor is constrained by existing residential developments. Ocean Views Estate to the south south west is comprised of 500/1000m² allotments with single dwellings. An established residential area exists to the east, with the active recreation reserve (Spring Creek Recreation Reserve) to the east/south-east reaches of the creek on the Surf Coast Highway.

Grazing land exists in the north of the study area. This area is currently zoned for residential development with site works having recently commenced.

The privately-owned vacant block of land to the west of the study area boundary on the Surf Coast Highway, is part of Ocean Views Estate, with a Plan of Subdivision lodged with Council.

The RACV Resort Golf Course is due south of the study area on the Surf Coast Highway.



Existing bike park with rural land use (background), zoned residential



Spring Creek Recreation Reserve (middle ground) and Ocean Views Estate (background)



Ocean Views Estate



Vacant land west of the study area boundary on the Surf Coast Highway

2.1.2 Vegetation Communities in and surrounding Spring Creek

The Spring Creek landscape has seen moderate levels of modification since European settlement. While there are residential areas and modified grassy patches close to some sections of the creek, there is still a significant area of relatively unmodified native vegetation, particularly in the northern stretches.

Broad scale DSE mapping (2009) indicates that patches of Coastal Alkaline Scrub exist around the south of the creek, with some Swampy Riparian Woodland and Grassy Woodland remaining further north.



Significant mature vegetation

A more detailed study by Beacon Ecological (Figure 2b, 2009) identified the presence of open mowed grassy areas, revegetation of both indigenous and introduced species, and areas of remnant vegetation of four high and very high conservation value Ecological Vegetation Classes (EVCs); Estuarine Wetland (EVC 10, Endangered), Coastal Alkaline Scrub (EVC 858, Endangered), Grassy Woodland (EVC 175, Endangered) and Plains Brackish Sedge Wetland (EVC 891, Vulnerable).

Vegetation within the Spring Creek corridor is of varying condition. However, the majority is considered to be in moderate condition due to a reasonable level of native species diversity and a moderate cover of weed species. Some areas, including some of those covered by Coastal Alkaline Scrub, Plains Brackish Sedge Wetland and Grassy Woodland, are considered to be in good condition. Other areas have been cleared of native vegetation and currently support a highly modified mix of native and weed species. These sections are considered to be in poor condition.

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 Spring Creek Reserve into the future, so 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 significantly increased.



Transition zone, estuarine (lower reaches) to riverine (upper reaches)



Lower reaches estuarine environment Moonah woodland



Upper reaches riverine woodland environment with *Phragmites* sp. dominant in the creekline



Rabbit warrens



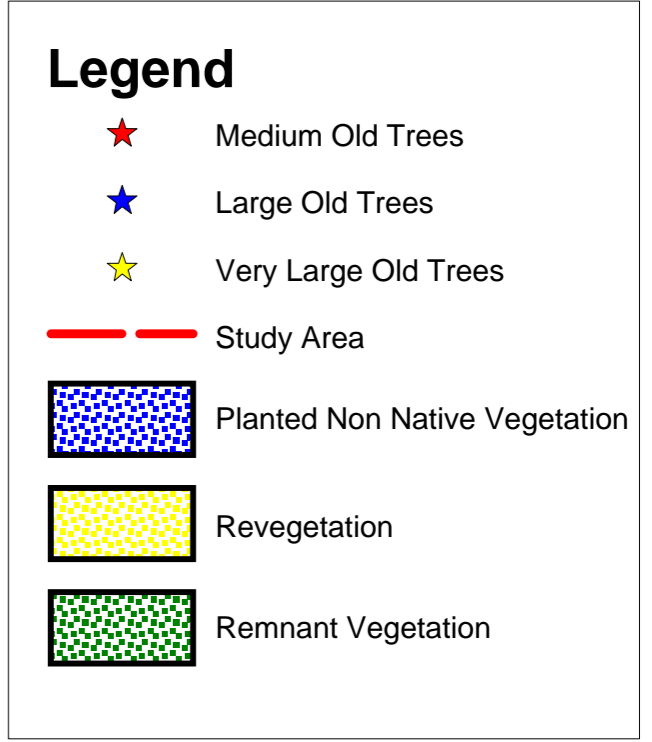
Revegetation on Bowman Track



Water treatment facility/wetland to the west of Bowman Track



Figure 2b
 Vegetation Mapping Spring Creek
 Beacon Ecological
 Scale 1:1000



Beacon Ecological (2009) extract of vegetation mapping

2.1.3 Water Environment

The water environment comprises natural and man-made elements in varying condition. This includes Spring Creek itself, Spring Creek Tributary to the north (outside the scope of this study) and water treatment facilities (wetlands) adjacent to the creek, one of which is fenced. Maintenance of the wetlands is by Barwon Water.

The water environment and associated vegetation contribute to a unique landscape 'story' created by the transition between riverine (upper reaches) and estuarine (lower reaches including wetlands) environments, and the site's proximity to the coast.

The proximity and access to water provides the local community with varied recreational opportunities (fishing, swimming, kayaking, views to water, nature appreciation, bird watching).



Spring Creek Tributary view south east toward Ocean Views Estate



Fenced out water treatment facility, adjacent to the Frog Ponds



Informal access to the creek

2.1.4 Landform and Landscape Character

The study area is dissected by Spring Creek, which drains in an easterly direction, approximately 2km northwest of the Bass Strait coastline.

A fresh water tributary drains easterly into Spring Creek from the north (outside the study area).

Landscape character within the study area is directly associated with land use and the water in the creek – either brackish and partly tidal in the lower reaches, or fresh water in the upper reaches. Vegetation associated with estuarine lower reaches is distinctive, mature and contributes significantly to the natural beauty, enclosure and quality of the creek. Landscape character to the upper (fresh water) reaches is more open with scattered woodland and 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.

Generally, the creek is immediately surrounded by low-lying land subject to inundation, with the exception of an area to the east of Ocean Views Estate and south of the bike park, which rises steeply from the creek margins and is largely inaccessible.

Outside the study area the landscape is either:

- north west - currently undeveloped rural land rising sharply from creek floodplain, heavily grazed by stock, weed infested with erosion and pest problems;
- south/south west- topography rises steeply within the new residential Ocean Views Estate, and
- south/south east - the study area narrows, is surrounded by steep topography populated by residential properties.



Localised high point, south of the Frog Ponds



Key views to the creek from localised high topographic point

2.1.5 Access and Connectivity

Currently, site access and connectivity is challenged by fencing, site topography, roads, path surfacing, a lack of creek crossings, areas of seasonal inundation, and dense vegetation. The study area affords accessibility and connectivity via:

- Road – the Surf Coast Highway on the southern boundary to Geelong (20km) and the Great Ocean Road accessing the Surf Coast to the south. The major road acts as a physical barrier between the SCLR and the coast to the south. Local roads access the site from surrounding residential areas.
- Public transport – public bus network on the Great Ocean Road to the south-east of the site to all coastal towns in the local Surf Coast and Bellarine Peninsula area.
- Non-motorised transport modes (cycling, walking, dog walking, etc.) to a range of local natural and recreational resources, including the coast, is possible via an intermittent trail network. Paths vary in formation from 'goats tracks', gravel, and concrete (access from Ocean Views Estate outside the study area) surfaces. Access to established shopping precincts, local strip shopping centres, schools, community and government facilities is currently challenging with a lack of bridge crossings.

The SCS produced a pathways strategy in 2006 (Table 1 below for a summary), which aims to achieve greater local connectivity.

There is one formalised river crossing point via a timber boardwalk bridge on the Surf Coast Highway.

Pedestrian access across the creek is also possible via an informal 'timber pallet home-made' bridge.



Goat trail on steep descent



'Home made' creek crossing



Access from Ocean Views Estate



Granitic gravel (surface types vary) Bowman Track and entry to Spring Creek Linear Reserve



Non-uniform transitions between paths from Ocean Views Estate to the Linear Reserve



Sealed concrete path and bridge crossing on the Surf Coast Highway

Table 1 Pathways Strategy Proposal for SCLR (As per review 2012)

Pathway Type	Network Category	Location Attributes	Details	Intended User
Shared Path	Shared Path	Township, wide, smooth, continuous and sealed	At least 1.8 to 2.0m wide, sealed, material and finish to be determined	Walkers, cyclists, wheelchairs.
Town Path	Footpath within towns for local access	Smooth, continuous and sealed	Minimum 1.5m wide material and finish to be determined	Skaters, walkers, wheelchairs, cyclists (under 12).

Note: the Surf Coast Shire is to investigate the use of alternative materials more suited to the natural environment for the shared path surfacing



Informal path through Moonah woodland



Stepped concrete path access from Ocean Views Estate

2.1.6 Open Space and Recreation

The site is immediately adjacent to the Spring Creek Recreation Reserve located to the east of Spring Creek. There is also an existing bike park (Spring Valley Park) to the south of the creek, in the northern section, on Spring Valley Drive.

Areas of maintained passive public open space exist to the east of Spring Creek, west of Alleyne Avenue, and are also currently used by private adjacent properties (kick-about area, etc).

2.1.7 Views

Due to the generally low elevation within a gully, clear views into the site are afforded from surrounding areas. The meandering nature of the creek does restrict some long views.

Views to Spring Creek from the Spring Creek Recreation Reserve are currently constrained by dense vegetation and advertising billboards.

Within the study area itself, views vary according to the local topography and nature/maturity of the vegetation affording either intimate or long vistas. Dense Moonah woodland within the riparian zone tend to contain views, whilst the open woodland areas upstream afford more open views.

A local topographic high point at the end of Springbank Circuit affords distant, clear views north, east and west to the coastline, rural hinterland and of the creek itself.

Visual permeability into the site is occasionally limited by 1.8m height paling fences to private property boundaries adjoining the site.



Informal open space, used by adjacent residences and the broader community



Intimate creek views framed by dense vegetation



Views from Spring Creek Recreation Reserve restricted by vegetation and signage



Local topographic high point with long views of the study area & beyond



Open views within the upper reaches

2.1.8 Cultural Heritage

Indigenous Heritage

The SCLR reserve is included in the Department of Planning and Community Development's (DPCDs) Aboriginal Heritage Act 2006-Areas of Cultural Heritage Sensitivity in Victoria (Geelong) mapping (2007), which are intended to assist in the identification of areas of cultural heritage sensitivity and provide indicative information about the location and extent of areas of cultural heritage sensitivity.

Additionally, a number of detailed cultural heritage reports have been compiled both along and adjacent to the SCLR corridor in relation to proposed works. Of direct relevance is the Spring Creek Pathway, Draft Torquay Cultural Heritage Management Plan Number: 11404 (Surf Coast Shire and Ochre Imprints, October 2010), which as a brief summary found:

“two registered Aboriginal places”.....comprising surface stone artefact scatter within the centre and northern section on the western side of Spring Creek, in the vicinity of Springbank Circuit. The desktop study also established that additional Aboriginal cultural heritage was likely to occur along floodplain and hill slope landforms within 100m of Spring Creek.

Additionally, the Duffields and Grossmans Roads – Residential Sub-division, Torquay, Victoria – Cultural Heritage Management Plan (AAV#10381) (7th May 2010) outlines a proposed Aboriginal Conservation Area within the Spring Creek Tributary.

Non-indigenous Heritage

The Victorian Heritage Register lists the State's most significant heritage places and objects. There are no heritage places listed on the Register located within or in close proximity to the reserve.



Spring Creek riparian zone

2.1.9 Climate

SCLR 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.

Any proposed vegetation and site furniture will need to tolerate these conditions, including salt spray.

2.1.10 Fire

The Spring Creek Reserve Fire Management Plan (2010) details the risks, past fire management and strategies for fire prevention. This plan only relates to the area directly west of Spring Creek from the Great Ocean Road to a point approximately 500 metres upstream. It acknowledges that fire management and strategies may need to be prepared for additional sections of the reserve over time.

The State of Preparation Report (2009) by the Victorian State Government identifies the Jan Juc area (which includes the study area) as one of 52 towns near bushland considered at the highest risk of ember attack. As part of a broad local plan, the CFA's Community Preparedness Guide (2010-2011) for Jan Juc and Bellbrae identifies the Spring 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 winds, 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
- varying topography and aspect
- proposed dwellings on the north easterly aspect, and
- Bob Pettitt Reserve in Jan Juc is identified as the local 'neighbourhood safer place / place of last resort'.



Entry fencing and timber seat at the bike park



Carpark fencing and restricted access, Aurora Crescent



Timber seat and signage at the entry to Bowman Track



Removable bollard, Bowman Track

2.1.11 Landscape Elements

Landscape elements are currently limited, with a lack of uniformity or consistent language, including:

- occasional informal seats at creek margins
- limited signage currently only at entry points (Bowman Track and bike park)
- car parking - non-designated on-street along Spring Valley Drive gravel car park adjacent to the Bike Park and gravel car park to the western end of Aurora Crescent
- removable bollard at the entrance to Bowman Track
- formal timber fishing platforms, and
- fencing: chainmesh surrounding water treatment facilities; post and wire and post and rail to the bike park and along creek upper reaches and eastern boundary (in parts) of creek; post and rail surrounding car parking at Aurora Avenue; a wide variety of boundary fencing styles by private residences.

2.1.12 Soils

The SCS's Soil Type Zones mapping data (Maher and Martin Survey 198, http://www.SurfCoast.vic.gov.au/environment/Documents/DG_SoilZones_A3_300dpi.pdf) 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 Spring Creek are comprised of the following (http://www.dpi.vic.gov.au/dpi/vro/coranregn.nsf/pages/soil_landform_units158):

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.



Chainmesh surrounding water treatment facility



Eastern boundary fence



Timber fishing platform



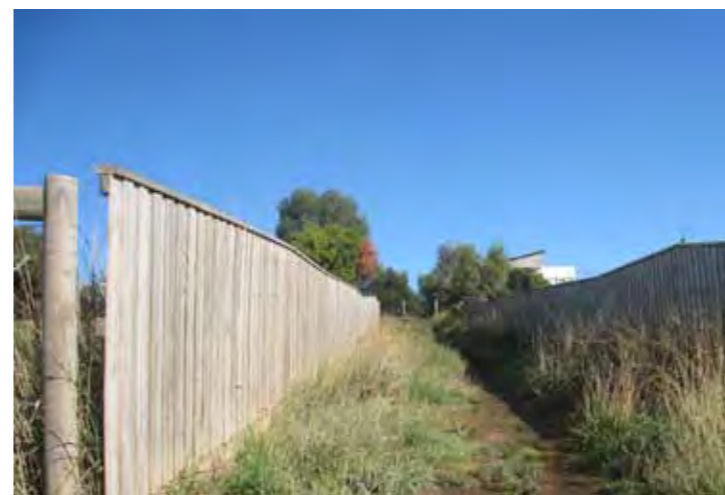
Post and wire fence and silt control at the bike park



Retaining wall and fence on Spring Valley Drive



Bike park site fencing



Fencing to private properties and access points



Spring Creek, *Phragmites* & open space

2.2 Master Plan Proposals

The following Master Plan recommendations are depicted on the Spring Creek Linear Reserve Master Plan on page 22.

The 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 the Spring Creek Linear Reserve has been derived through feedback from community consultation, Project Steering Group (PSG) and Project Reference Group (PRG) guidance.

The vision of the Master Plan is to protect and enhance the undeveloped character of the linear corridor whilst supporting the needs of current and future generations through provision of a variety of recreational opportunities.

2.2.2 Guiding Principles

In accordance with responses from community consultation, PSG and PRG groups, and through Council guidance, the following principles have been applied in preparing the Master Management Plan:

- Balance social needs with protection and enhancement of the natural environment.
- Protection and enhancement of native vegetation.
- Provide a 30m protection buffer to the creek.
- Provide an outline plan for a variety of recreational opportunities. Designs will be refined through future detailed design phases.
- Provide an accessible public realm – path and bridge connections throughout the study area, and between existing and future developments.
- Provide a landscape with a strong local identity with respect for existing site attributes.
- Design for community connectivity to open space and the environment.
- Implement a signage ‘language’ - directional, informational and educational – to strengthen legibility.
- Design for the study area’s location within a high risk fire zone.
- Practical considerations - maintenance, fire prevention, crime prevention through environmental design (CPTED), sensitive material selection and cost.
- Protect and enhance creek water quality - Water Sensitive Urban Design (WSUD) initiatives to conform with Melbourne Water guidelines.
- Articulation of cultural heritage.
- Justification (scientific or other) for design solutions for the community.



A strong local identity reinforced through vegetation types

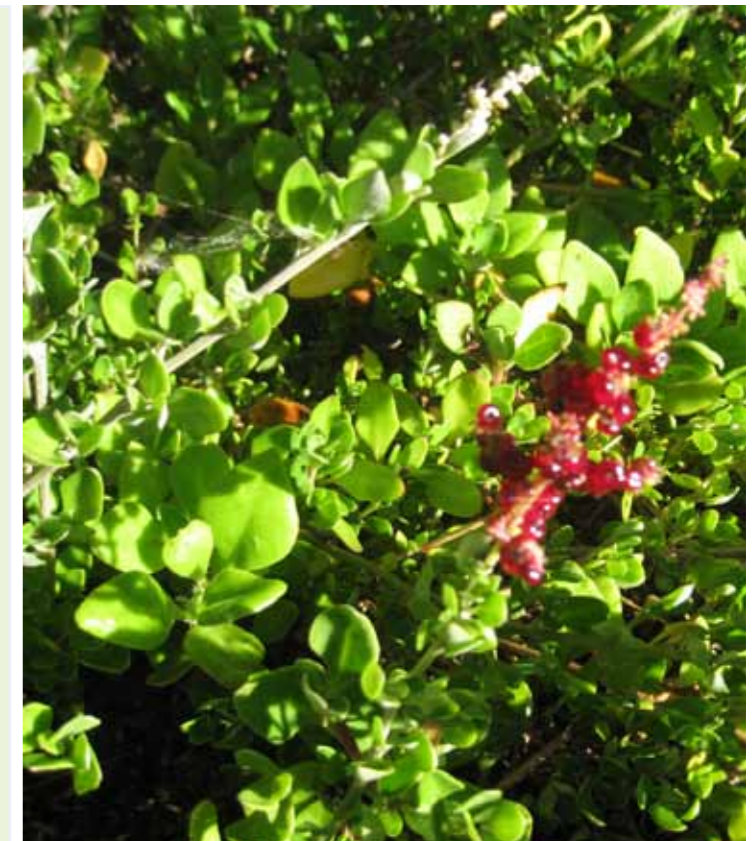
2.2.3 A Strong Local Identity

A strong local identity can be embedded into a community resource through cultural and environmental narratives. The existing landscape site character is already valued by the local community, providing an opportunity to reinforce and unify key elements, whilst new (appropriate) recreational opportunities are planned to allow for social interaction. As development surrounding the study area evolves, the importance of this reserve to the community will increase.

Recommendation

To reinforce local identity the Landscape Master Plan recommends:

- Enhance site character by using plants, materials and finishes that reflect the local environment – upper creek reaches (woodland) and lower creek reaches (estuarine).
- Iconic landscape features to be preserved and legibility enhanced.
- Involve local indigenous (Wathaurung) communities in regeneration and interpretation projects.
- Implement revegetation and/or public art projects that involve the community, and foster pride and 'ownership'.
- Provide a varied experience with access for all where possible and opportunities for user groups to interact.
- Crime Prevention through Environmental Design (CPTED) principles to be implemented - overlooking into public places, retain site views and permeability.



Estuarine habitat

2.2.4 Passive and Active Recreation

Passive Recreation

The majority of public open space (POS) is to provide for passive activities (walking, nature appreciation, picnicking). Community feedback supports a focus on this use.

Beacon Ecological (2009) recommended three landscape planning zones, with a focus on passive recreation. This Master Plan set out has been determined according to suggested Conservation Zone A (Remnant Vegetation and Existing Revegetation), Conservation Zone B (Rehabilitation and Restoration) and Recreation Zone.

Recommendations and final design outcomes (including those outlined below) that fall within the Surfviews Estate ownership boundary will be subject to further negotiations with the property owners and conditions of the planning permit, and/or will be subject to their review.

Recommendations

The Landscape Master Plan recommends (site wide) (refer to Master Plan on page 22 for location of items):

- Implement a linked pathway network throughout the site and to existing and proposed communities.
- Provide a family of interpretation (signage) elements.
- Provide viewing platforms on boardwalks, bridges and at locally high points. Design is to be low-key, with railings, signage and seating.
- Install resting benches at regular intervals (locations indicated on page 22 Master Plan).
- Provide one additional fishing platform to the south-western creek side.
- Install picnic tables at activity nodes (Aurora Crescent picnic area, bike park play ground and Nature Play).
- Manage access to the water from viewing and fishing platforms, and resting benches. Two additional (stand alone) viewing platforms to be installed at Duffields Road and west of Sarabande Crescent.
- Provide a varied experience moving through the reserve via path placement, highlight key views, public art and focal points; enhance vegetation in accordance with EVCs, a variety of spaces and activities.

Active Recreation

Active recreation will occur on shared paths (cycling) and at key nodes throughout the site (bike park, exercise circuit, kayaking on the creek southern reaches and informal kick-about spaces)

Recommendations

The Landscape Master Plan recommends (site wide) (refer to Master Plan on page 22 for location of items):

- A kayak launch to be constructed on the southern most existing jetty (east side of creek) with existing access from the netball court car park.
- Provide an exercise circuit (Figure 5) with five stations around the creek upper reaches, outside ES01.
- The shared pathway (refer 2.2.12 and Figure 4) is to be appropriate for recreational cycling through the site, and is to link to existing and proposed cycle ways where possible.
- Provide two informal mown grass 'kick-about' areas (refer 2.2.8).

2.2.5 Local Parks

Local parks are to achieve a balance between supporting community interaction, a variety of recreational experiences and environmental values. Activity nodes, formal parks and associated elements that respond to particular community needs will be located outside environmentally sensitive, flood and culturally sensitive designated zones wherever possible. Local parks recommended within this Master Plan include: Nature Play (2.2.6), Bush Tucker (2.2.7), Torquay Bike Park (2.2.8) and Aurora Crescent Picnic and Recreation Area (2.2.9).

2.2.6 Nature Play

A Nature Play and Bush Tucker Local Park is to be located largely outside the ESO, 30m buffer and FO on the northern side of Spring Creek. It is to link integrally to the proposed wetlands and bush revegetation. It will comprise a children's play area and picnic (table and shelter) facility. It will be unique to the local area and will act as a community meeting place.

The nature play area is to allow children to explore, discover, imagine, create, share, enjoy and connect with the natural Australian environment. It aims to help build a stronger, healthier community through benefits to health and well-being.

The aim is to nurture environmental awareness and encourage the community to respect, value, protect and conserve the natural environment for future generations.

Recommendations and final design outcomes (including those outlined below) that fall within the Surfviews Estate ownership boundary will be subject to further negotiations with the property owners and conditions of the planning permit, and/or will be subject to their review.



Location of Nature Play

Recommendations

The Landscape Master Plan recommends:

- Australian bush (incorporating creeks and wetlands) theme highlighting a connection with the natural environment.
 - Provide opportunities for active involvement and unstructured education through play. Interpretation elements are to reflect the local cultural and natural heritage. Opportunities are to include interaction with wetlands and water, imaginative play (discover leaves and sticks, build cubbies, hide and seek, etc.), and exploration zones (climbing over rocks earthworks, in trees, through water).
 - Provide a sense of arrival, orientation to the site and outline the experiences it offers.
 - Provide a picnic area within a natural setting, which will act as a base from which visitors can explore. Park furniture including a covered shelter, a picnic table and seat combination, and a bench seat.
 - Provide educational interpretive material that celebrates local indigenous cultural heritage, biodiversity, flora and fauna, ecological processes, water cycle and management, and seasons.
 - Signage to highlight activities (e.g. nature walks).
 - Implement a sustainable play space for the long-term with consideration for minimal maintenance.
- Provide a design that will evolve within the existing and proposed vegetation, integrate carefully into the site's topography and character.
 - Include functional community artwork (e.g. earthworks/land art, planting, custom-built play equipment).
 - Provide a 30m buffer to the creek.
 - Provide access for all parking on the street adjacent to the park.
 - Provide access for maintenance vehicles.
 - Provide access from the shared pathway network and adjacent residential area.
 - CPTED principles to be embedded in design (e.g. visual permeability).
 - Include the nature play area in any update of the SCS Playground Strategy.



Use of existing topography



Native fauna discovery

Example (indicative) images of nature play



Tree climbing



Timber play working with existing topography



Sculptural play elements



Community art projects that enhance the character of the space, tell a story (e.g. nest eggs above) and act as an additional play element



Access to wetland environment



Safe interaction in water



Imaginative play using site elements



Interpretation of the natural environment



Stick teepee



Traditional cultural elements to give structure to the play area - weaving as screening, a play element (e.g. a maze), educational interpretation and potential cross-cultural community project



Local flora discovery



Timber balance boards

Examples of features that could complement the Nature Play area.

2.2.7 Bush Tucker

Bush tucker plant species are to form a seamless addition to the nature play space planting design. They are to add an additional educational, cultural interpretation and play dimension.

Recommendations and final design outcomes (including those outlined below) that fall within the Surfviews Estate ownership boundary will be subject to further negotiations with the property owners and conditions of the planning permit, and/or will be subject to their review.

Recommendations

The Landscape Master Plan recommends:

- Australian bush theme is to include a planting palette with the diversity of bush plants integral to indigenous Australians diet and culture.
- Determine an appropriate plant species palette in consultation with Wathaurung group.
- Planting is to be translated via interpretation signage including medicinal/therapeutic, cultural (e.g. ceremonial) and food uses.
- All proposed species are to be indigenous.
- Articulate traditional stories associated with species through signage and planting layout.



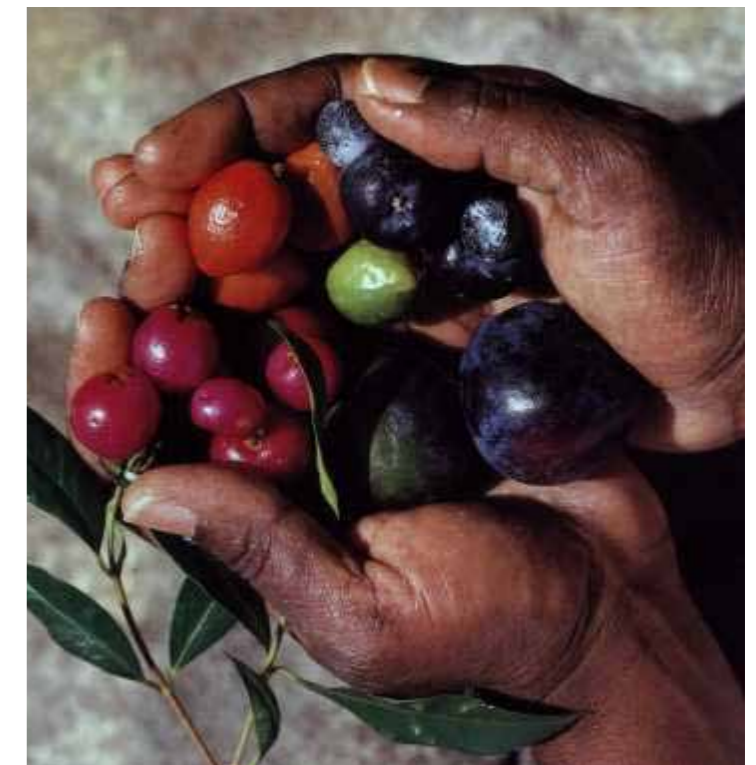
Location of Bush Tucker



Bush food discovery



Bush medicine



Bush food plantings

2.2.8 Torquay Bike Park

A local park is proposed adjacent to the Torquay Bike Park (designed by Mexted Rimmer 19th May 2009), and endorsed by Council. Recommendations incorporating both the Mexted Rimmer plan, and additional elements have been outlined below.

Recommendations

The landscape Master Plan recommends:

- A kick-about area collocated adjacent to the play ground. The space is to utilise the existing open, flat nature of this site, and accommodate fire prevention principles.
- Access for all, off street car park with minimum eight spaces.
- A children's playground designed not to be a dominant feature.
- A covered BBQ facility, table and seat combination, drinking fountain, bin and dog bowl.
- Planting, ensuring visibility into the site.
- Information signage.
- Design to integrate seamlessly with the adjacent bike park.
- Playground and car parking are to remain clear of environmentally sensitive and flood zones.
- Provide strong physical and visual links to open space areas, existing and proposed residential areas and wider community facilities.



Existing Bike Park landscape plan to act as the basis to future detailed design, in partnership with the SCLR Master Plan recommendations.

Location of Bike Park play ground and kick-about

2.2.9 Aurora Crescent Picnic and Recreation Area

A picnic area is to be located to the south of Aurora Crescent.

Recommendations

The Landscape Master Plan recommends:

- Ensure car park to allow connectivity and access for all to the shared pathway, picnic area and adjacent open recreation space and to the future bridge.
- Consider means to deter anti-social “hooning” at the court head and car park through surface treatments and traffic control devices.
- Reform gravel surface to car park.
- The car park will facilitate access for all walking circuit: from the Aurora Cres, across the bridge, around the Bowman Track and back, or through the Moonah heading north and return.
- Site furniture is to include a table and seat combination.
- Informational and directional signage (with distances, walking circuits and difficulty) is to be installed at the car park.
- Install a uniform surfacing to paths.
- Any new planting is to complement EVCs.
- Maintain key viewlines/visual legibility to Spring Creek and between existing spaces (Spring Creek Recreation Reserve, car parking, shared path and informal open parkland).



Location of Aurora Crescent Picnic and Recreation Area



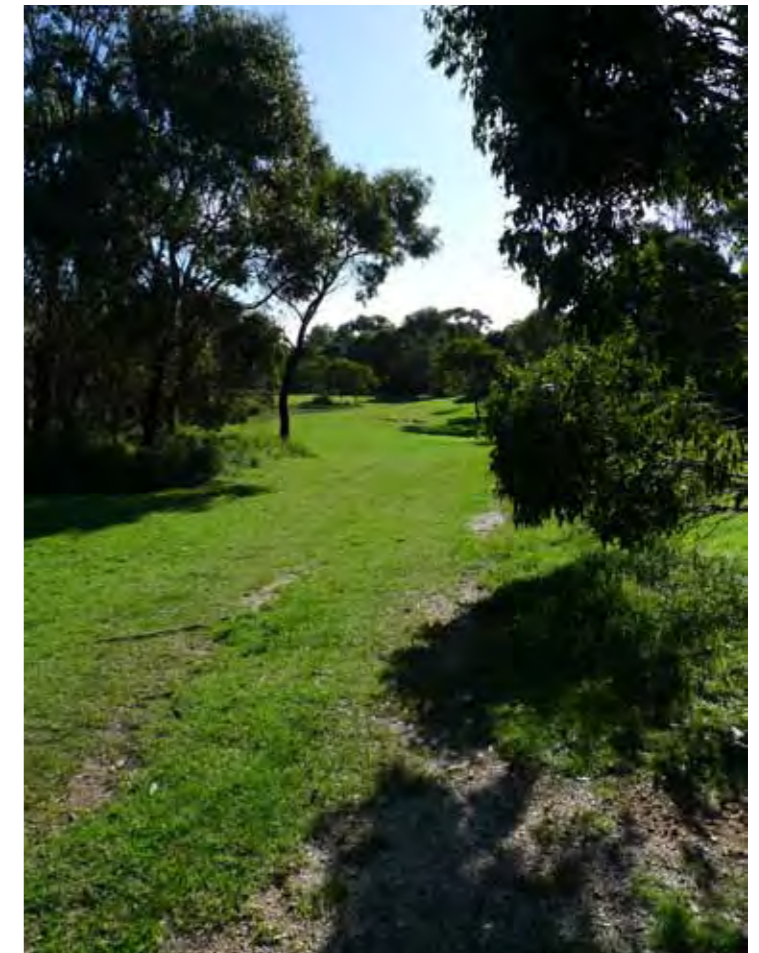
Upgrade car parking, allow access for all to bridge and walking circuit



Upgrade signage



Implement consistent surfacing and link into proposed shared pathways



Maintain informal active recreation and picnicking area. Planting to reinforce existing habitat

2.2.10 Areas of Upstream Influence (outside the study area)

Areas upstream of the study area will provide benefits for the SCLR by enhancing habitat significance, biodiversity, water quality, local connectivity and access. This includes Spring Creek riparian zone to the west of Duffields Road, and the Spring Creek Tributary, running through the proposed Surfviews Estate to the north of the site.

Council should also consider future urban development and potential and the impacts of run-off and flows in the creek. Future planning should link areas of upstream and catchment biodiversity with remnant and high value vegetation.

Recommendations

The Landscape Master Plan Recommends:

- Landscape designs within the Spring Creek Tributary will enhance/complement the SCLR Master Plan, and adhere to ecological and landscape planning guidelines outlined by Beacon Ecological (2009).
- The tributary should be utilised as an effective WSUD feature.
- Landscape design should incorporate the tributary as a recreational resource.
- Weeds and pest management plan should be developed.



Spring Creek Tributary to be revegetated and managed



A technically functional (WSUD) community recreational resource.



Effective WSUD, whilst allowing community access to water

Areas of upstream influence

2.2.11 Integration of the Public and Private Realms

The SCS has the ability to influence future residences that have an adjoining boundary onto the reserve.

Recommendations

The Landscape Master Plan recommends:

- Crime Prevention through Environmental Design principles for housing overlooking public places and paths, including permeable fences, adequate night lighting and community 'ownership' of public reserves.
- Fencing (and/or height) on the reserve boundary should be minimised permeable to maintain an open semi-natural character for the reserve and encourage 'eyes' on the reserve for safety.
- Landowners are to be encouraged to consider indigenous planting (consistent with the Master Plan) within gardens to soften the appearance of fencing or as an alternative to fencing.



Suitable interface - permeable or low fencing, or gardens that complement the reserve, with consideration of fire
Existing photo from Jan Juc Linear Reserve Corridor.



Embracing the local wildlife
Existing photo from Jan Juc Linear Reserve Corridor.

2.2.12 Pathway Network

The aim of the pathway network is to provide an environment that is attractive to walk through a variety of settings and includes circuits, direct routes to facilities, access for all, and resting places at suitable intervals.

It will comprise a two path hierarchy of sealed surface shared paths and informal gravel surface paths to specific interest sites.

Paths will prevent creation of informal 'desire lines' into sensitive habitat areas.

The path network role aims to double as a buffer to habitat areas from turfed or weed areas, and to provide a path construction suitable for vehicle use (emergency, maintenance and fire access only).

communities and facilities. The location of the Aurora Crescent bridge to consider existing vegetation and Barwon Water infrastructure.

- Provide an experiential path between Aurora Crescent and the Surf Coast Highway. The main shared path will pass through the Spring Creek Recreation Reserve. The existing chain mesh fence to the boundary is to be removed or relocated. Dense revegetation will provide a barrier to access between the creek and the reserve.
- Provide a sealed shared path circuit, suitable for wheelchairs, from Aurora Crescent, across Spring Creek via a new bridge, around Bowman Track and the existing wetlands and return. Currently the Pathways Strategy indicates the west side of the wetland path only to be sealed. This recommendation is for a sealed path entirely around the wetland.

Recommendations

The landscape Master Plan recommends (refer Figure 4 and Figure 5):

- Where not constrained by topography or sensitive environmental habitat provide access for all site wide.
- Paths will avoid ES01, FO and LSIO zones wherever possible.
- Construct paths so as not to unduly affect cultural heritage areas.
- Large areas of paved surfaces will be avoided or broken up with discrete patterning in the surface and/or landscaping.
- Paths are to follow the natural contours and be screened by planting.
- Path will be built without over clearing at their margins.
- A varied experience will be created for the user moving through the site.
- Paths will be consistent with the aims of the SCS pathways strategy (2006). However the Surf Coast Shire is to investigate the use of alternative materials more suited to the natural environment for the shared path surfacing.
- Paths will conform to Australian and access for all standards / best practice.
- Provide three (3) new bridge crossings: Aurora Crescent, Spring Valley and Duffields Road. This will allow access site wide, a variety of routes/circuits around the site and direct access between



Boardwalk with handrails through wetland.



Granitic sand experiential path, in a colour to match the sealed asphalt path



Path as a buffer between invasive grass species and revegetation areas



Meandering boardwalks through wetlands



Sealed asphalt path and raised boardwalk over culturally sensitive zone



Boardwalk section & drainage solution in a known seasonal inundation area.



Figure 4. Proposed Pathway Network



Figure 5. Circulation Plan

2.2.13 Interpretation (Site-Wide)

The current lack of interpretation signage throughout the reserve has been raised by both Council and the community. Site-wide signage is required to guide the use of spaces, wayfinding and understanding of the environment.

Additional information may be provided in an indirect manner through public artworks and detailed landscape design details.

Recommendations

The Landscape Master Plan recommends:

- Interpretation elements are to be strategically located throughout the site and will serve a variety of uses including:
 - Extending the community’s understanding of place through information about the natural and cultural environments and their heritage and significance
 - Contributing to a sense of place and unifying site character through an interpretation ‘language’ (or style, design, etc.)
 - Providing, recording and/or conserving local knowledge, and
 - Considering modification of behaviour to help create spaces that are valued by the community.
- Development of an interpretation strategy is to be undertaken during detailed design. The signage hierarchy is to be unified and highlight the character of individual spaces and associated use (e.g. landscaped areas would have a higher order signage strategy than the trail network, which would be discrete).

- The signage strategy would comprise:
 - Trail markers at key intersections and entrances to the reserve with directional information and distances.
 - Educational signage to key cultural (cultural heritage area to the north) or natural heritage significant sites (e.g. native vegetation, wetlands, creek crossings) throughout. Work with local indigenous groups to draw out a narrative cultural interpretation.
 - Information at key nodes (Nature Play, Aurora Crescent picnic area, Bowman Track, bike park play area) outlining site use.
 - The Nature Play area is to provide specific interpretation about traditional indigenous culture and the natural environment.
 - Provide interpretive elements at all viewing platforms and look out points.
 - Signage at all key entry points (refer to Master Plan on page 22 for locations).
 - Materials will be naturalistic and contemporary in colour and form, with the use of timber, coloured concrete and steel (e.g. corten).

Example (indicative) images of signage



Shared path - directional, distance and access



Place names



Special interest



Natural and cultural environment information



Entry features and cultural interpretation as part of the detailed design



Markers in boardwalks and on paths



Discrete interpretive signage, such as in the Nature Play area



Viewing platform signage

2.2.14 Public Art

Public art has the potential to reinforce the character of a place.

Within this natural environment the role of public art must be carefully understood within the context of the site so as not to detract from the intent of the landscape Master Plan, social or environmental values.

Recommendations

The landscape Master Plan recommends:

Public art is to be considered within detailed landscape design. An artist/s will form part of a team to provide a perspective to the design and build (e.g. special finishes, design details, an additional layer of interpretation that becomes embedded in the park). Artworks will be proposed:

- at key activity nodes as part of play equipment or furniture (e.g. Nature Play area and Bike Park);
- to highlight key park entrances (Bowman Track entry from the Great Ocean Road, Spring Valley Drive at the bike park; and one entry from the proposed Surfviews Estate leading to Spring Valley bridge.
- as part of the detailed design (boardwalks, feature fence, etc);
- as key natural or cultural interpretation elements;
- as special commissions;
- within paving surfaces on major thoroughfares, and;
- ongoing maintenance and management of the artwork for Council will be considered within the design process.



Landscape design details



Interpretation and seating and play sculpture



Interpretation and sculpture



Special commissions (Andy Goldsworthy)



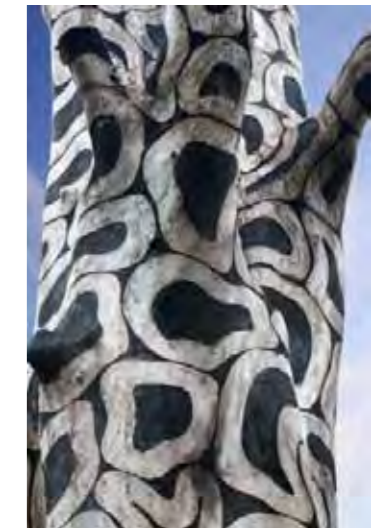
Temporary works, field art - special commissions



Focal points



Landscape design details



Special commissions

Example (indicative) images of public art



2.2.15 Wetlands and Water Sensitive Urban Design

Designs are to consider an organic and responsive form and function. Solutions may comprise a combination of drainage swales, permeable pavements, buffer strips, infiltration systems, rain gardens, wetlands and other treatment systems. They are also to consider treatment of drainage off any landscape proposals (e.g. paths) so as not to cause detriment to the surrounding environment.

Currently, there are two retarding basin facilities proposed as part of the Surfviews Estate development, within the SCLR on the northern side of the creek. Due to the planning status of the Surfviews Estate, there are limitations to the revision of WSUD solutions currently proposed (size, location, layout, type of system). A response sympathetic to the surrounding environment and social needs, and one that fits in with the guiding principles of this Master Plan is to be achieved as much as possible within these constraints.

Recommendations and final design outcomes (including those outlined below) that fall within the Surfviews Estate ownership boundary will be subject to further negotiations with the property owners and conditions of the planning permit, and/or will be subject to their review.



Planted swales to car parks and road edges to treat water prior to run off into creeks and tributaries

Recommendation

The Landscape Master Plan recommends:

- Rainwater harvesting and storing storm water for re-use in landscape irrigation has not been considered necessary. Landscape designs will not propose any treatments where irrigation will be required.
- To conserve water within the landscape:
 - Planting designs and use of local provenance plants, and/or ‘water-wise’ plants
 - Schedule planting for mid to late Autumn to take advantage of natural rainfall and soil conditions
 - In key planting areas (e.g. Nature Play), condition the topsoil with organic matter to increase water retention, and
 - Surface mulching to retain moisture if complementary to ecological considerations.
- For Wetland areas:
 - Boardwalks to be designed and incorporated as part of the overall pathways strategy. They are to be designed to Australian Standards and include a viewing platform with seat and signage
 - Provide for views of the water environment
 - Design is to take inspiration from existing boardwalks and fishing platforms in the local area (e.g. Torquay Common)
 - Existing treatment system weed management and planting options to comply with the principles of the SCLR Master Plan
 - WSUD to Melbourne Water Best Practice Guidelines, and
 - Wherever possible, consider alternatives to end of line water treatment solutions (e.g. soft engineering, planted swales permeable surfacing, etc)



Wetlands contribute positively to landscape character, use and environmental function



Habitat



Planted swales as a parkland feature

2.2.16 Hard Landscape Materials, Site Furniture and Amenities

A cohesive and locally responsive material palette is to be implemented. Site furniture recommended for this Master Plan includes: bench seats, table and seat combination, BBQ, shelter and bollards. Signage is covered in section 2.2.13 above. Path materials are covered in section 2.2.12 above.

Recommendations

The Master Plan recommends:

- Coastal exposure – robust and durable materials, reducing life cycle costs to the Council – this would include timber, local stone, concrete in various forms and corten steel.
- Structures and materials that integrate with the environment and respect the local topography, the natural environment.
- Special features / materials where required are to reflect and reference the natural environment and must not visually dominate the site.
- Consider appropriate functionality.
- Colour (e.g. built form, play equipment, bins, signage) is to reflect and integrate with the natural environment.
- Contemporary, yet fitting to the natural environment and complementary to existing palette, if appropriate (e.g. Torquay Common furniture)



Bench / log seat



Shelter, table and seat combination



Boardwalk fencing



Bins



Bollards



BBQ

2.2.17 Protection and Enhancement of Native Vegetation

The aim is for planting to reinforce existing remnant EVC themes and promote the existing character and biodiversity of the reserve. From a management perspective it will also ensure that species are well adapted to local soil and climatic conditions.

As a priority, future vegetation management activities undertaken by Council should focus on the protection and enhancement of the existing remnant vegetation in Spring Creek to maintain and improve the overall condition of the EVCs present. This can be achieved through a reduction in the weed growth and use of supplementary planting of understory species to maintain and improve the overall condition. Future revegetation should be compliant with the relevant benchmarks identified for the 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.



Moonah flower



Moonah woodland



Bellarine Yellow Gum

Recommendation

The Landscape Master Plan recommends that the primary landscape design criteria for the selection of plant materials:

- Comply with the recommendations and plant schedules within Beacon Ecological's report (2009).
- Guided by SCS's "Indigenous Vegetation for Landscaping and Revegetation" *guidelines and Indigenous Planting Guide for Coastal Areas within the Surf Coast Shire* (July 2003), Precinct 1 Torquay/Jan Juc.
- Dictated by plant schedules provided in the SCLR Master Plan and Council guidelines. Plant schedules and EVC areas specific to the site are to form the basis of the landscape planting palette and set out.
- Provide/reinforce an attractive landscape and character throughout the reserve.
- Provide a planted 30m buffer zone to both sides of Spring Creek.
- Enhance the micro-climate and habitat of the site.
- Provide shade, visual interest, spatial structure and general amenity.
- Support flora and fauna habitat.
- Assist in reduction of bushfire risk – to be balanced with conservation imperatives – particularly in areas to the south-west and within close proximity to housing.
- Grass planting to informal areas will need to be an introduced species to ensure robustness for anticipated use and minimal maintenance for Council. A buffer from this turf planting is to be established adjacent to EVCs. Kikuyu is not to be used.
- Use and manage vegetation to subtly define different use areas while retaining visual permeability into the reserve.
- Consider limb drop risks when placing new trees, particularly near play areas.
- Enrich biodiversity.
- As part of detailed design, develop site specific environmental management plans (for each recreation zone / type), including a weed management plan.
- Any removal of native vegetation must be in accordance with Victoria's Native Vegetation Management Framework (Department of Natural Resources and Environment, 2002).
- Dense (indigenous) screen planting to Barwon Water Pump Station and Spring Creek Recreation Reserve.

2.2.18 Fire Risk

The SCLR is within a high risk fire zone.

Recommendations and final design outcomes (including those outlined below) that fall within the Surfviews Estate ownership boundary will be subject to further negotiations with the property owners and conditions of the planning permit, and/or will be subject to their review.

Recommendations

The Master Plan recommends:

- Detailed design is to be in accordance with Australian Standard AS 3959-2009, Construction of buildings in bushfire prone areas (Standards Australia) CFA guidelines for Jan Juc and Bellbrae, and SCS's Spring Creek Reserve Fire Management Plan, which outlines current emergency management, fire ecology and biodiversity management policies and approaches.
- Planning for fire must be balanced with other considerations to be achieved by the Master Plan including: use of indigenous species, aesthetically pleasing, enhancing the EVCs and local site character (in parts woodland), suitability for water treatment facilities, water-wise and non-invasive.
- A 2-3 metre wide buffer zone is to be maintained/implemented to adjoining properties. This could be an area of the locally indigenous fire retardant species Bower Spinach (*Tetragonia implexicoma*) or a strip of non combustible material such as gravel.
- Areas to the south / south-west of the site are to have detailed design landscape strategies to prevent increased fire risk.

3.0 Management Plan

The directions and recommendations contained within this section of the report have been delineated into three defined management categories:

- River Health
- Waterway and Stormwater Management' and
- Landscape and Open Space.

The Landscape Management Plan (3.3) has been informed by background information, site descriptions, guiding principles provided earlier within this document and specific issues raised by community consultation and the SCS in order to ensure the intent is achieved.

3.1 River Health

3.1.1 Vegetation Protection and Management

The following sections provide guidance on the future protection and management of remnant native vegetation in the Spring Creek Reserve. The information presented in the following sections has drawn on relevant site specific information from Beacon Ecological (2009), the Department of Sustainability and Environment Revegetation Planting Standards (DSE 2006) and the Corangamite Native Vegetation Plan (CCMA 2005).

Successful protection and management of vegetation requires managers to understand and consider a range of factors that can impact the success of their project. Riverness (2011) has identified, when planning vegetation management projects, it is important the project manager considers the following factors:

- Project goal
- Condition and extent of remnant vegetation at the project site, which in turn determines whether the project will focus on:
 - Protection of remnant vegetation
 - Establishment of overstorey and/or understorey plants within a remnant patch(i.e. supplementary planting)
 - Establishment of native vegetation in formerly cleared areas outside of a remnant patch(i.e. replanting).
- Specific site conditions (e.g. soil type, slope), and

- The type and severity of threats present.

The following sections provide an overview of the critical factors that affect the success of vegetation management projects. This information can be used in conjunction with other resources to help manage, successfully plan and implement a diverse range of vegetation management projects.

3.1.2 Project Goals

The management recommendations in this report provide guidance on the proposed directions for management of the Spring Creek Reserve. However, managers are encouraged to develop goals for their projects to define the purpose of their activities and helps focus on the desired outcomes.

A key element of the project goal in the Spring Creek Reserve will be to determine if the project is to focus on protection of remnant vegetation or establish vegetation in other more disturbed areas.

Priorities for vegetation management along Spring Creek corridor that have been adopted by Beacon Ecological (2009) based on recommendations from *Biodiversity Action Planning – Landscape Plan for Gherang Zone, Otway Plain Bioregion* (Grant et al. 2003) are:

- Protection - reservation, covenants, management agreements, statutory planning and fencing of native vegetation.
- Enhancement - management of existing ecological values by controlling threats such as weeds, introduced predators, inappropriate/uncontrolled grazing by stock and native animals, salinity, and encouraging natural regeneration and revegetation of the understorey.
- Restoration - revegetation to create corridors, buffers, patches of habitat, reintroduction of individual plants and animals into depleted populations.

The recommended focus for vegetation management projects should be to focus on protection and

enhancement of remnant vegetation before embarking on re-establishment of un-vegetated areas.

3.1.3 Protection and Enhancement of Remnant Vegetation

Good management of remnant vegetation in Spring Creek has the potential to yield significant net gain in the quality and extent of vegetation.

In order to achieve an overall net gain, the management activities should focus, as a minimum, on the protection of all existing remnant vegetation. This can be achieved through:

- Implementation of permanent protection of native vegetation
- Retain all standing trees, dead or alive, and
- Retain all fallen timber/branches/leaf litter.

If natural regeneration of native species is inadequate, the quality of existing stands of remnant vegetation can be enhanced through targeted planting of seedlings of canopy and understorey species. This approach will increase the overall habitat hectare value of the stand of vegetation. If this approach is adopted, weed control will also be necessary and should be implemented with caution to minimise impacts to remnant vegetation.

Beacon Ecological (2009) has identified the Ecological Vegetation Classes (EVCs) of Spring Creek. It is critical to ensure species selected for supplementary planting are selected from the appropriate EVC. Failure to do so would negatively impact the anticipated net gain.

Table 2 – Planting standards for various project objectives (Riverness 2011)

Objective	Approach to replanting
Restore the structure and diversity of EVCs and maximise resilience to climate change driven stresses and/or Restore critical biodiversity functions/habitat requirements	MUST consider species diversity targets MUST consider species tolerance to climate change MUST consider establishment processes on successional stages SHOULD include establishment of particular overstorey, understorey and ground cover structure/diversity for key species habitat needs (e.g. feeding/foraging/nesting) in high priority fauna locations
Restore important structural components of Ecological Vegetation Classes	MUST be based on DSE Net Gain* objectives MUST use EVC benchmarks MUST include DSE Net Gain* density targets for overstorey and understorey woody life forms (and large tussocks in some grassy EVCs)
Restore the overstorey of Ecological Vegetation Classes	MUST use EVC benchmarks MUST include DSE Net Gain* density targets (overstorey only)
Rehabilitate landscapes (e.g. streambank stabilisation, salinity control, general habitat improvements)	Use mixed indigenous and/or non-indigenous native species with no density targets Initial planting may focus on trees (and possibly shrubs) with future plantings undertaken as appropriate SHOULD reference EVC benchmarks and Net Gain* density targets

*DSE Revegetation Planting Standards (DSE 2006).

Riverness (2011) identifies standards that should be applied to the revegetation and supplementary planting in order to achieve the desired increase in net gain (Table 2).

Where supplementary re-vegetation is undertaken, the approach must comply with DSE Revegetation Planting Standards (DSE 2006). Key elements include species selection, density of planting, 10-year survival rates and location in the riparian zone.

It is important to note that, while revegetation to defined EVC benchmarks may be desired, there are practical limitations to restoring the complete diversity of species in an EVC. For example, some species are difficult to cultivate and many grasses do not establish well as they are often outcompeted by weeds.

3.1.4 Restoration of Un-vegetated Areas

Where possible all revegetation should refer to the appropriate EVCs benchmark identified in Beacon Ecological (2009). In areas where planning controls identify the requirement to vegetate a 30m buffer along the creek, the revegetation standards must comply with EVC benchmarks (DSE 2006).

In parts of Spring Creek where there is a mixed use, it may be more appropriate to restore the overstorey only due to the desire to retain sight lines. Where possible, it should be in accordance with the EVC benchmark for canopy species.

3.1.5 Site Preparation

Good site preparation is critical to the success of all vegetation projects. Site preparation not only includes ground preparation and weed or pest animal control prior to the year of planting, it should also include follow up maintenance of the site to support the establishment of vegetation and reduction in the threat posed by weeds.

The size of the site should be carefully considered to ensure the area is within the capacity of the project manager to adequately implement a pest plant control and revegetation program. It is preferable in sites with high levels of weediness to undertake the work in blocks or sections. Consideration should also be given to use of rabbit proof fencing, instead of tree guards, in areas where there is likely to be high numbers of shrub and smaller species planted. Project areas should generally not be smaller than 300sqm.

3.1.6 Pest Plant Control

Prior to embarking on a weed control program, a number of factors should be considered in relation to the target area and the vegetation community present. For example, weed control for areas where vegetation is to be re-established is very different to methods used to protect areas of high quality remnant vegetation. Methods for the control of weeds available to managers include chemical application, mechanical removal, manual removal and community education.

Areas of remnant vegetation in Spring Creek are of very high conservation significance and can be incorporated in net gain accounting for Surf Coast Shire. Inappropriate weed management could cause off-target damage, impacting the condition of vegetation, resulting in loss of condition and a reduction in net gain. To minimise impact to high value vegetation, it is recommended the process outlined in the vegetation standards for weed control (Riverness 2011) is followed. The process includes:

1. Assessing the problem.
2. Considering the control options/methods and determining:
 - a. Their effectiveness in treating the problem
 - b. Their practicality in treating the problem, and
 - c. Potential risks of application to both on-site and off-site values. This needs to also consider the risks around the control options.
3. Developing a weed control program.
4. Implementing the program.
5. Maintaining a monitoring and review program.

3.1.7 Chemical application

Chemical application of herbicides is one of the most commonly used methods for control of a wide range of weed species. Chemical application has a range of advantages including relatively low cost, can be used with precision in difficult areas, an effective method for control of perennial weeds and they limit physical disturbance to a site.

Use of chemical can also pose a risk to sensitive areas such as waterways, there is the potential for off-target damage to remnant indigenous species if spray drift occurs, a high degree of experience is required when working with high quality remnants.

3.1.8 Mechanical removal

Mechanical removal using machinery is effective for woody species such as gorse and boxthorn. Care should be exercised in areas with remnant vegetation due to the potential for damage.

3.1.9 Manual removal

Manual removal or hand weeding can be a very effective control method in areas of high quality indigenous vegetation. This approach avoids impacts to non-target species providing there is significant knowledge of weeds species and native vegetation.

3.1.10 Community Education

The close proximity of Spring Creek to urban areas poses a risk to indigenous vegetation through the spread of weeds from suburban gardens. Community education programs are an effective means to work with communities adjacent to the waterway to implement practices that minimise the risk of spread of exotic garden species.

3.1.11 Pest animal control

In the case of Spring Creek the focus for pest animal management are rabbits. Identifying the most appropriate pest animal control option follows a similar

process for weed control. The proximity of the linear reserve to large urban areas limits control options often implemented in vegetation management projects.

There are a range of possible options for control of rabbits in the reserve and if implemented it should be reflected as an integrated approach that utilises a number of the options that address the rabbit population, harbour and warrens. Options for control that should be considered include:

- Baiting;
- Warren fumigation;
- Warren destruction;
- Fencing;
- Harbour removal;
- Guarding; and
- Habitat manipulation.

3.2 Waterway and Stormwater Management

3.2.1 Flow Management Opportunities

i) Flood Flows

The catchment draining to the outlet of the Spring Creek Linear Reserve, adjacent to the golf course, covers approximately 5,200ha. Existing development is located in the lower part of the catchment, as is shown in Figure 3.2.1, and covers an area of approximately 235ha. The remainder of the catchment upstream is rural. The main drainage path through the existing area of development is the Spring Creek Recreation Reserve.

Based on the Regional Rational Method (methodology in accordance with Australian Rainfall and Run-off), peak flood flows have been estimated for the catchment in Table 3.2.1.

Table 3.2.1 – Spring Creek Catchment Peak Flood Flow Estimates (m³/s)

ARI	Flow estimate (m ³ /s)
100	34.2
50	27.8
20	21.2
10	16.6
5	13.1

There are a number of stormwater pipe drainage outlets that discharge stormwater from the existing surrounding urban development into Spring Creek Linear Reserve. It is understood, that on the east side of the creek, there are four existing outlets and on the west side there are two. The two outlets on the west side discharge into wetlands, whereas the four outlets on the east side discharge directly to the creek. It is understood that the creek is tidal up to the Surfviews Estate.

At present, it is understood that the stormwater runoff discharging from these existing outlets is generally not attenuated. As part of the future Surfviews Estate, based on the drainage Master Plan, retarding basins are proposed within the Spring Creek Linear Reserve to attenuate stormwater flows from that estate. Given the relatively large size of the Spring Creek catchment and the location of Torquay at the bottom of the catchment, the peak of the stormwater runoff discharging from urban development within Torquay is likely to occur before

the main peak within the creek, which is likely to be generated from the upper part of the catchment. There may be limited benefits of attenuating stormwater runoff discharging into the Spring Creek Linear Reserve on the peak flood flows within the creek. A more holistic hydrological investigation of the catchment should be undertaken to confirm this.

The locations of the proposed retarding basins for the Surfviews Estate appear to be within the floodplain for Spring Creek. The overall effect that the stormwater runoff from the estate have on flood flows within the creek should be reviewed.

Significant scour was observed during a site visit at a number of the stormwater outlets. Energy dissipation structures should be installed at each outlet to limit flow velocities discharging into the creek and control erosion.

3.2.2 Stormwater Harvesting Feasibility Assessment

It had been identified that harvested stormwater could be used to irrigate the sports ovals at Spring Creek Recreation Reserve.

Based on an assumed demand of 2ML/ha, the annual demands for the oval at the Spring Creek Recreation Reserve (1.73ha) has been initially assessed to be 3.46ML. For the purpose of this assessment, a daily demand was derived based on this annual estimate and with consideration of the variation throughout the seasons of the year.

i) Catchments

An existing stormwater pipe drain crosses beneath Spring Creek Linear Reserve. That drain conveys stormwater runoff from an upstream catchment, including existing development immediately to the east of the Surf Coast Highway. The existing developed area within this upstream catchment, which appears to be directly connected to the pipe drain passing beneath the reserve, covers approximately 7.04ha and is presented in Figure 3.2.1.

ii) Stormwater Runoff

Stormwater runoff was assessed for the catchment using daily rainfall data for the gauge at RACV Resort Golf Club (087160), obtained from the Bureau of Meteorology and covering the 10-year period from January 1999 to December 2008.

It is important that some of the stormwater runoff from the upstream catchment is allowed to continue downstream to help maintain the existing health of the waterway. It is recognised that not all the stormwater runoff from the catchment should be available for harvesting. For the purpose of this investigation, it has been assumed that in any one day only 50 per cent of the stormwater runoff volume would be potentially available for harvesting.

iii) Stormwater Harvesting Potential

Water balance analysis was undertaken to calculate a required storage size that would achieve a 90 per cent reliability of harvested stormwater being able to meet the identified demand. This analysis showed that a 1ML-sized storage tank (i.e. approximately equates to the surface area of one tennis court to the fenceline x 2m in depth) would be sufficient. Potential locations for such storage

may be under the oval, under the tennis court car park, or to the south west corner of the Spring Creek Recreation Reserve. No consideration of climate change was given in the assessment of storage size.

A stormwater treatment drain would be required at the inlet to the storage tank, which would be expected to consist of a Gross Pollutant Trap (GPT) and biofilter.

Further investigations would be required to be undertaken to determine the feasibility of a scheme before more detailed design could be progressed. This would include, in particular, testing of the suitability of the water quality of the stormwater runoff from the catchment. Subject to this, further treatment may be required in addition to the proposed wetlands.

3.2.3 Other Stormwater Harvesting Opportunities

In addition to Spring Creek Recreation Reserve, a further opportunity for stormwater harvesting may exist within the Surfviews Estate, where a large green open area is towards the north of the site. The use of this area would need to be balanced with current and proposed use of the public open space. The drainage layout for the site was not available for this study and it is not clear how stormwater could be harvested.

Feedback from the consultation process has shown that Stormwater Harvesting is generally not supported and no

3.2.4 Water Quality Treatment Opportunities

i) Stormwater Quality Objectives

With regard to the protection of receiving waters, the *State Environment Protection Policy (Waters of Victoria)* (SEPP) specify objectives for receiving waters in the State of Victoria. The Stormwater Agreement between the EPA, Municipal Association of Victoria (MAV) and Melbourne Water allows for urban areas to be 'deemed to comply' with SEPP if the Best Practice Stormwater Management objectives are applied. These objectives are referred to in the Urban Stormwater Best Practice Environmental Management Guidelines (BPEMG) published by the EPA for the design of stormwater treatment systems. These objectives relate to target reductions in annual pollutant loads compared with typical urban pollutant loads, and are summarised as follows:

Table 3.2.2 – Stormwater Quality Objectives

Stormwater Pollutant	Catchment outlet adjacent to the golf course
Total Nitrogen	45% reduction from typical urban loads
Total Phosphorus	45% reduction from typical urban loads
Total Suspended Solids	80% reduction from typical urban loads
Litter (Gross Pollutants)	70% reduction from typical urban loads

The water quality treatment measures proposed in this assessment have been developed to achieve the BPEMG objectives.

ii) Identified Objectives

There is limited space within the existing areas of development where opportunities for a distributed water quality treatment approach could exist.

The main discharge points from the existing areas of development into Spring Creek and their corresponding catchments are presented in Figure 3.2.1. The main opportunities for the existing areas of development appear to be within the linear reserve, where 'end of line' treatment measures at a sub-catchment scale could be utilised.

On the west bank of Spring Creek, two existing wetlands are located that provide water quality treatment to the existing development to the west. On the east side of the creek there are four main stormwater outlets which discharge stormwater directly into the creek that appear to be not treated.

As part of the previous landscape master plan for Spring Creek Reserve, a wetland was proposed to provide treatment for stormwater from the existing development to the east. Based on discussions with Council, it is understood that due to cost implications, conflicting uses (with a particular focus on public safety) and need for space within the Spring Creek Recreation Reserve, that the wetland is not considered feasible.

An alternative to providing a wetland would be potentially to adopt a distributed treatment approach and implement rain gardens throughout that sub-catchment. Further work would be required to identify specific suitable

Table 3.2.3 – Required Wetland Areas to achieve BPEMG

Catchment ID (see Figure 1)	Catchment Area (ha)	Wetland Area Required (m ²)
SpringCk_Wetland1	10.01	1100
SpringCk_Wetland2	8.43	935
SpringCk_Wetland4	24.36	2310
SpringCk_Wetland5	31.28	2860

See figure 3.2.1 for urban catchments.

opportunities for this.

Two further additional wetlands should be provided for the two other main stormwater outlets (Spring Creek Wetland 1 and 2 – see Figure 3.2.1).

Based on initial MUSIC modelling, the size of wetlands that would be required within the linear reserve for the catchment to achieve BPEMG objectives are presented in Table 3.2.3.

As part of the Surfviews Estate, two wetlands are proposed within the linear reserve to provide water quality treatment for that estate.

The adoption of wetlands as an 'end of line' treatment measure at a sub-catchment scale will potentially occupy significant space within the linear reserve. For existing areas of development, the alternatives are limited. However for new areas of development, more distributed measures could be adopted that provide treatment within the development before the stormwater reaches the linear reserve.

3.2.5 Climate Change

The exact effects of future climate change are unclear. However to the best of our present knowledge it is understood that the mean annual rainfall is likely to decrease and individual rainfall events are likely to become more intense but occur less often, leading to relatively long periods of drought.

Therefore under a climate change scenario:

- the peak flood flow estimates presented in Table 3.2.1 would be expected to increase, which would potentially lead to an increase in the flood levels along Spring Creek;
- the sea level would be expected to increase which would lead to a general increase in water levels along the tidal effected reach of the creek, which is understood to extend upstream to the Surfviews Estate;
- the total annual volume of stormwater runoff would decrease and without redundancy in the system, the reliability of stormwater harvesting schemes would potentially also decrease.

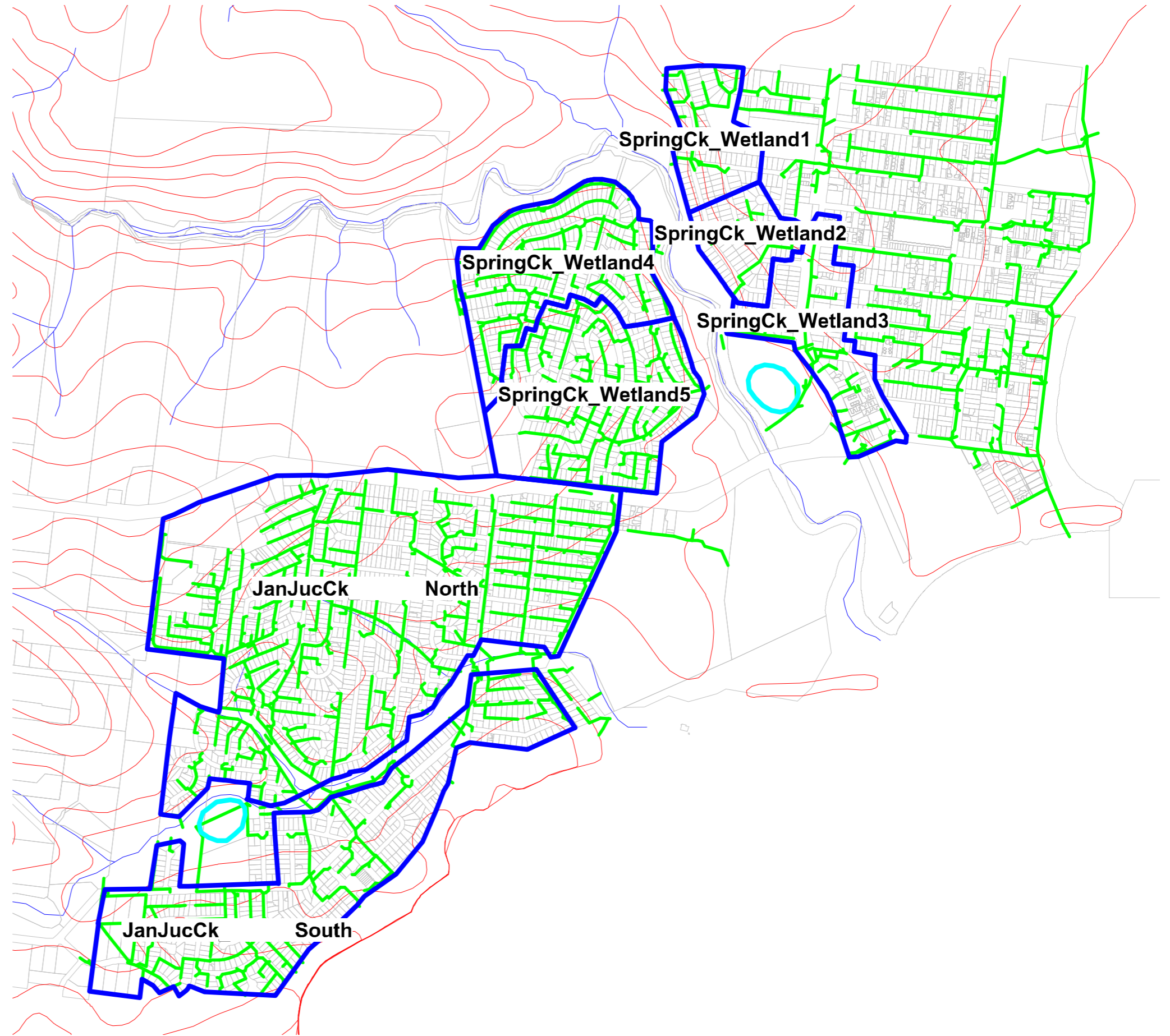


Figure 3.2.1 Urban Catchment Drains to Spring Creek (not to scale)

3.3 Landscape and Open Space

3.3.1 Purpose

This section of the report outlines broad landscape management actions to support the SCLR Master Plan recommendations, from which detailed strategies can be developed and implemented at future design phases.

While these master plan recommendations include key management issues for landscape they may be incorporated into the ongoing maintenance strategy and form the basis of briefs for future projects. They are anticipated to include the following:

- public safety;
- access ie. bollards/fencing/signage;
- managing areas for recreation including facilities;
- management of weeds and introduced species (section 3.1);
- protection and supplementation of the existing biodiversity (section 3.1);
- fire prevention;
- indigenous heritage, and;
- future management by community interest groups.

3.3.2 Current Management Boundaries

Refer to Figure 3.3.1

3.3.3 Management Zones

The landscape management plan comprises two key zones:

- conservation areas, and;
- recreation areas.

Conservation areas are covered by section 3.1. The landscape management section addresses recreation areas. Future detailed design within these zones would dictate the need for a management plan that targets more specific needs. Success of the management strategies outlined below for the recreation areas initially relies on implementation by Council following implementation of the detailed public open space designs. Future monitoring and success will depend on numerous local authorities and interest groups.

3.3.4 Indigenous Heritage

Management should protect indigenous heritage sites and interpret them in a way which instills interest and promotes an appreciation of Aboriginal culture and the aboriginal heritage of the area. Local Aboriginal groups are to be involved in the planning and management of assets.

Recommendations

The Master Plan recommends:

- Protect Aboriginal sites from disturbance or damage by human activities.
- Provide interpretation and promote a general understanding and appreciation of Aboriginal culture

through interpretive and information signs, guided walks and talks, information boards, brochures, newsletters and workshops (where feasible).

- Encourage research into past Aboriginal use of the area including site wide surveys for Aboriginal sites.
- Conduct archaeological survey to prevent works that may disturb, damage or destroy relics from occurring.

3.3.5 Vegetation Management

Vegetation management, conservation and protection and weed management is covered in detail in section 3.1. Management of vegetation is critical to the ongoing amenity of the reserve and should be an undertaken proactively as an integral component of Council maintenance regimes.

Recommendations

The Master Plan recommends:

- Implement management strategies to improve plant health and vigour (e.g. pruning, eliminate hazards) and regularly assess trees for defects.
- Monitor nutrient levels (soil tests) to ensure ongoing suitability for tree and turf growth. Test soils around declining vegetation as a priority. Correct nutrient deficiencies by appropriate means.
- Develop a tree replacement strategy for ageing vegetation prior to its decline.
- Reinstate turf areas with a turf type which is easy to establish and tolerant to wear, drought, salt and shade. Turf should not be invasive to adjacent habitat areas.
- Prevent or discourage access to habitat areas via formal paths.
- Instruct contractors to minimise disturbance to natural flora and fauna within the reserve.
- Ensure protection of natural vegetation forms part of any landscape contractual agreement (for general landscape maintenance) via pre-determined measures.



Spring Creek Linear Reserve

Study Area

- Council Owned/Managed
- GORCC Managed Land
- Areas of Interest

23 CROSSHAYS ROAD
PO BOX 338
TORQUAY, VICTORIA
AUSTRALIA 3278
PHONE +61 3 3261 0000
FAX +61 3 3261 4377
INTERNET www.surfcoast.vic.gov.au
EMAIL info@surfcoast.vic.gov.au

'The Place of Wellbeing'

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Jan Juc Creek & Spring Creek Master Plan



Scale 1:16,331
Print Date: 25/5/2011

This map is produced by the Geospatial Data Australia (GDA) and GDA is provided by the Australian Geospatial Data (AGDS).

Figure 3.3.1 Existing Management Boundaries - Spring Creek and Jan Juc Creek



3.3.6 Landscape Character and Visual Quality

Management actions to reinforce the landscape character and visual quality of the Spring Creek corridor.

Recommendations

The Master Plan recommends:

- Regularly maintain facilities including site furniture (e.g. empty bins, maintain shelter and toilet structures, seats, remove/repair vandalism, etc.).
- Ensure site components remain visually integrated with the setting.
- Retain sight lines between key elements / locations.
- Retain significant views and vistas.
- Ensure informal active recreational pursuits do not impact detrimentally on areas provided for passive activities.
- Regularly maintain grassed (e.g.kick-about areas) and landscaped areas, particularly at the interface to habitat areas.

3.3.7 Public Safety

Recommendations

The Master Plan recommends:

- Ensure all built elements are to Australian Standards and Building Codes(e.g. play equipment, pathway surfacing, etc).
- Fencing and bollards at key locations to prevent pedestrian / cycle and vehicular (4WD, motorbike) conflict.
- Signage to inform visitors of potential risks in POS sites, water treatment facilities and specific use facilities such as fishing platforms.
- Maintain views into the site.

3.3.8 Access

Recommendations

The Master Plan recommends:

- Designating access points/routes to reduce unnecessary disturbance/trampling of the landscape and assist in preservation of habitat as well as managing weed infestation.
- Vehicle access should be minimal with car parking areas designated at Aurora Avenue, Surfviews Estate and Spring Valley Drive / Bike Park.
- Spring Creek Valley local park will require some designated vehicular access for the indigenous garden and maintenance of facilities.
- Disabled access opportunities should be explored at all locations, however in some areas local topography will constrain access.
- Controlled access using fencing and bollards, whilst allowing for unhindered physical and visual access to discourage 4WD's motorbikes, etc.
- At all POS sites provision of signage to inform visitors/community of access points, ie. clear site maps of all POS areas.

3.3.9 Fire

Landscape management actions to manage fire risk are to comply with Australian Standards and include but are not exclusive to the following.

Recommendations

The Master Plan recommends:

- The Spring Creek Reserve Fire Management Plan is to be expanded to consider the reserve as a whole. It is to detail the risks, past fire management and strategies for fire prevention and acknowledge that fire management plans and strategies may need to be modified as the reserve is developed over time. Revise on an annual basis
- Prevent dead vegetation from mounding around the base of trees.
- Prevent/remove piles of dead vegetation. Logs and branches to be scattered to provide fauna habitat.
- Remove long ribbons of loose fibrous bark from the lower section of trees.

- Retain clear access tracks.
- Cut back branches/foliage overhanging within 2m of a roof line, clean out twigs and leaves from roof gutters of amenity buildings.
- Regular slashing of understorey to 100mm height.
- A 2-3 metre wide buffer zone is to be maintained/ implemented to adjoining properties. This could be an area of the locally indigenous fire retardant species Bower Spinach (*Tetragonia implexicoma*) or a strip of non combustible material such as gravel

3.3.10 Future Management - Community Interest Groups

Actions to encourage involvement in management of the SCLR public asset include identification of opportunities.

Recommendations

The Master Plan recommends:

- Encourage recreational activity groups such as orienteering, bird watching, etc;
- Create community awareness using seminars/ publications throughout the design and implementation process;
- Initiate community ownership and interest through interpretation signage;



Existing wetland

3.4 Management Recommendations

The following tables provide recommendations for the future management of the Spring Creek Linear Reserve. Actions have been prioritised in accordance with criteria for the three theme areas: Vegetation Protection and Management, Waterway and Stormwater Management and Landscape and Open Space.

Vegetation Protection and Management

	Vegetation Protection and Management	Waterway and Stormwater Management	Landscape and Open Space
High	Actions that protect very high and high conservation value remnant vegetation. Capacity building actions for community members,	Actions to address significant drainage issues including capacity and design issues. Implementing distributional stormwater management.	Actions to address safety, priority issues raised by community and user group consultation, and/or an action that will significantly improve the functionality/use of the reserve.
Medium	Supplementary planting of existing remnant areas and restoration of EVCs fringing remnant vegetation.		Implementation of the action is dependent upon the success of other recommendations that are to be implemented in the short term; the item is within the ownership boundary of Surfviews Estate and will be subject to negotiations with the property owners and conditions of the planning permit, and/or will be subject to their review; the issue is not urgent in terms of the way it affects the use or safety of/ within the reserve; the item exists and is functional in its current form with an upgrade required: or the item requires a thorough investigation, consultation and determination of funding mechanisms prior to implementation.
Low	Restoration of benchmarked EVC vegetation.	Localised drainage issues.	They have a low impact on current functioning safety of use within the reserve.

General Recommendations

These recommendations are of a general nature and can be applied across multiple zones or the entire Spring Creek linear Reserve.

Implementation Priorities	Priority or time frame	Indicative Cost \$
River Health - Vegetation protection and management (CAP EX)		
Protect existing very high and high conservation significance vegetation through formal mechanisms.	High	\$30,000
Conduct annual monitoring of the reserve to identify and control new and emerging weeds.	Ongoing	\$10,000
Conduct community education program to increase awareness of native vegetation protection and to reduce the threat common garden species pose to native vegetation.	High	\$5,000
Develop a detailed design for vegetation management (incorporating weed management) across the reserve. The action should include the implementation of a 30m riparian buffer in accordance with the SCS planning scheme.	High	\$15,000
Develop a detailed implementation program for pest animals	High	\$5,000
Seek external funding to assist protection and management of vegetation in the reserve	High	n/a
Supplementary planting of Grassy woodland and Coastal Alkaline Scrub to increase the extent and quality of remnant vegetation. * Fill gaps in vegetation in accordance with EVC benchmarks to restore area surrounding remnant vegetation. (Assumes treatments of 20x20 m fenced plots with rabbit proof fencing to reduce grazing and allow planting of sub shrub species).	Medium	\$5,000

* Allow for minimum 3% inflation per year on all items.

Implementation & Maintenance	Priority or time frame	Indicative Cost \$
River Health - Vegetation protection and management (ONGOING)		
Increase the capacity of operations staff to identify remnant vegetation and weed species	Ongoing	\$ 1,000 per annum
Implement site wide rabbit control program in partnership with adjoining landholders and developers.	High	\$15,000 per annum
Weed management of understorey weeds and supplementary planting of shrub species in accordance with Coastal Alkaline Scrub and Grassy Woodland EVC benchmark to increase the extent and quality.	High	\$15,000 per annum
Landscape and Open Space (ONGOING)		
Landscape Maintenance per annum - Year 1	High	\$15,000 / ha
Landscape Maintenance per annum - Year 2	High	\$14,000 / ha
Landscape Maintenance per annum - Year 3	High	\$13,000 / ha
Landscape Maintenance per annum - Year 4	High	\$12,000 / ha
Landscape Maintenance per annum - Year 5	High	\$11,000 / ha
Landscape Maintenance per annum - Year 6 -10	High	\$10,000 / ha
Regular slashing of understorey to 100mm height.	High	\$5,000 / ha
A 2-3 metre wide buffer zone is to be maintained/implemented to adjoining properties. This could be an area of the locally indigenous fire retardant species Bower Spinach (<i>Tetragonia implexicoma</i>) or a strip of non combustible material such as gravel	High	\$5,000 / ha

* Allow for minimum 3% inflation per year on all items.

Implementation Priorities	Priority or time frame	Indicative Cost \$
Waterway and Stormwater Management		
Energy dissipation structures should be installed at each outlet to limit flow velocities discharging into the creek. Assumed to be rock structures. (5 sites \$10,000/site)	Medium	\$50,000
Control of peak flood flows within Spring Creek. A holistic stormwater management plan should be prepared for the Spring Creek catchment, which should include confirmation of requirements for retardation of stormwater from development into the creek. Subject to the above, the rationale for locating the Surfviews Estate retarding basins within the floodplain and the overall effect that this and the stormwater runoff from the Surfviews Estate have on peak flood flows within the creek should be reviewed.	High	\$20,000
Implement within the linear reserve two further wetlands to receive and treat stormwater from the other two existing stormwater outlets (Based on 2035m2 wetland area at \$200/m2)	Low	\$410,000
Landscape and Open Space		
Path - sealed, assumed coloured bitumen, shared pathway 2-2.2m width	High	\$395,000
Path - unsealed, experiential	Low	\$38,000
Path - cultural heritage	High	\$85,000
Bridges (proprietary item) x3	High	\$285,000
Interpretation signage	Low	\$50,000
Resting benches	Low	\$11,500
Boardwalk, including 1x viewing platform	High	\$70,000
New planting site wide (4 tubes/m2, jute mat, mulch, rabbit proof fence)	High	\$130,000
1 x Fishing Platform, 3 x Viewing platforms (including look out), 1 x kayak launch	Low	\$62,000
Nature Play, including Bush Tucker	Medium	\$320,000
Kickabout (x2) preparation and grassing	Medium	\$35,000
Bike Park - childrens playground and 12 car spaces (sealed)	Medium	\$145,000
Exercise stations (x5)	Low	\$35,000
Aurora Crescent picnic area, including 6 car spaces including reform gravel carpark	Low	\$25,000
Protect Aboriginal sites from disturbance or damage by human activities.	High	\$25,000
Develop a tree replacement strategy for ageing vegetation prior to its decline.	High	\$13,000
Fencing and bollards at key locations to prevent pedestrian / cycle and vehicular (4WD, motorbike) conflict.	Low	\$10,000
Signage to inform visitors of potential risks in POS sites, water treatment facilities and specific use facilities such as fishing platforms.	Low	\$5,000

* Allow for minimum 3% inflation per year on all items.

4.0 References

1. Beacon Ecological (2009) for the Surf Coast Shire, *Vegetation Assessment of Jan Juc and Spring Creek, Jan Juc, Victoria: EVC Mapping, Assessment of Potential Net Gain and Landscape Planning Recommendations*. Surf Coast Shire.
2. Surf Coast Planning Scheme, www.dse.vic.gov.au/planningschemes/surfcoast/home.html (accessed August 2011).
3. Township Protection Plan (2010), http://cfaonline.cfa.vic.gov.au/mycfa/Show?pageld=publicDisplayDoc&fname=2011/TPP-W-BSW-Jan-Juc-Bellbrae-2_00_40145.pdf (accessed August 2011).
4. Australian Standard AS 3959-2009, Construction of buildings in bushfire prone areas, Standards Australia.
5. DSE (2009), *Ecological Vegetation Class Benchmarks* for each Bioregion, www.dse.vic.gov.au (accessed October 2011).
6. Grant, C., Duffy, A. and Lowe, K. (2003) *Biodiversity Action Planning - Landscape for Gherang Zone, Otway Plain Bioregion*. Published by The Department of Sustainability and Environment, Victoria.
7. DSE (2006) Native Vegetation Revegetation Planting Standards – Guidelines for establishing native vegetation for net gain accounting. Victorian Government, Department of Sustainability and Environment, East Melbourne
8. DSE (2011), *The Victorian Investment Framework Vegetation Draft Work Standards (DSE 2011)*, www.dse.vic.gov.au/_data/assets/.../MIF_Guidelines_20112012.pdf

Community Engagement Feedback

Results of community engagement

The Summary of results of the community engagement are listed in the following table as collated by SCS.

General notes

- Total number of submissions 105
- People who made multiple submissions have their comment listed once.
- People who have multiple signatures on their submission have each signatory counted.
- Organisations are listed as they represent more than one individual.
- Members of the Project Steering Group who made submissions are noted with PSG by their name.
- Issues that are management are listed, but will be directed to the relevant part of Surf Coast Shire

Issue / Community engagement feedback	Number (incl org'n)
Bridges	
Support new bridges (especially one at Aurora Cres 2, incl Tony Smales PSG) especially Spring Valley Creek bridge (1) Bridges and paths should be high priority (2)	13 (Tony Smales PSG)
Don't support southern one near Aurora Cres	4
One near existing jetty to link to path between 33 and 34 Spring Valley Drive	1
Proposed Aurora Cres bridge is close to Barwon Water Sewer pipe	1 (Barwon Water)
Rubbish bins	
Can rubbish bins be placed along the track?	5
Dog poo bag dispensers	2
Canoe launch	
Supported	2 (Tony Smales PSG)
Won't work as creek is tidal	1
Kayak launch at Aurora Cres	1
Fishing platform	
Support west side one	1
Revegetation	
Support	5 (Tony Smales PSG)
No trees over sewerage assets	1 (Barwon Water)
Paths	
Support connection to Eton	1
Don't seal/bitumen, use gravel (4) Especially through remnant vegetation (1)	5
Support (general)	1
Ensure accessible for all	1 (Tony Smales PSG)
Don't seal one from Aurora Cres heading north (4)	4
Seal path from Aurora Cres down to Great Ocean Road.	1
Extend path from Great Ocean Road Crossing up to main entrance into rec reserve so can get in on game days when gate locked and/or get past.	1
Ensure vehicle access to southern wetland for maintenance.	1 (Great Ocean Views Pty Ltd)
Show access track from Great Ocean Road to start of Bowman Track for maintenance vehicles	1 (Great Ocean Views Pty Ltd)
Provide access from Spring Valley Drive to gross pollutant trap	1 (Great Ocean Views Pty Ltd)
Ensure access to northern wetland and frog ponds for maintenance	1 (Great Ocean Views Pty Ltd)
Aurora Cres Car parking	
Not supported (not needed = 2)	3

Community Engagement Feedback cont.

Issue / Community engagement feedback	Number (incl org'n)
Don't extend or seal small area only (1)	
Don't seal (1)	2
Slow entrance to area to reduce hoon activity (2)	2
Dogs	
Keep off leash	3
Make dog off leash	1
Exercise stations	
Support	2
Natural play area	
Support	1
Interpretation	
Support	1
Public art	
Support	1
Seating	
Don't support	1
Other	
Install bird breeding boxes	1
Create kickabout space on west back near proposed Aurora Cres bridge	2
Land at south-east corner of Ocean Views estate should not be residential but park	1
Insufficient parking allocated and use of on street parking not favoured	1 (Great Ocean Views Pty Ltd)
Indicate on plan environmental protection areas	1 (Great Ocean Views Pty Ltd)
Silt trap removed from northern wetland while maintenance period still has time to run	1 (Great Ocean Views Pty Ltd)
Seal, maintain and ensure accessibility to all of 'laneways' in Ocean Views Estate	1 (Tony Smales PSG)
Ensure access to Barwon Water infrastructure	1 (Barwon Water)

Community Engagement Feedback cont.

Most common issues

The following is a summary of the most common issues that arose from the community engagement on the Draft Master Plans in order of frequency of mentions, followed in brackets with the recommendation of the Project Steering Group (PSG) and the Project Reference Group (PRG) Where the PRG recommendation differed from the PSG this is included in square brackets.

- Support a playground at Spring Creek Recreation Reserve. (PSG Support. Agree vicinity of scout hall would be preferred location.) [PRG Support. Agree vicinity of scout hall would be preferred location. However, the PRG noted that there are a number of playgrounds that would be of higher priority as per the Playground Strategy.]
- Support for new bridges at Spring Creek Linear Reserve. (PSG & PRG Support. Final location of bridge near Aurora Crescent to be determined after further investigation and taking into account existing vegetation and Barwon Water infrastructure.)
- Rubbish bins along the Spring Creek Linear Reserve track. (PSG & PRG Support. Placement to be where people congregate (eg Spring Valley Drive bike park) and to consider issue of ease of maintenance.
- Support for revegetation in Spring Creek Linear Reserve (Support. Revegetation to be in line with recommendations of the 2009 Beacon Ecological report).
- Don't seal/bitumen tracks in Spring Creek Linear Reserve. (PSG & PRG: Investigate the use of alternative materials more suited to the natural environment).
- Shade structures. [PRG supports the installation of shade structures in strategic locations in addition to the planting of shade-giving trees.]

In addition to these issues a broad range of other issues and suggestions and input came from the community. Where appropriate these are being incorporated into the final plans and/or directed to relevant Council officers for follow up. Refer to the full Analysis of Feedback in the tables.



Protect existing vegetation communities



www.ghd.com

GHD Pty Ltd

Level 2, 60 Brougham Street, Geelong, 3220
T (03) 5273 1800 F (03) 5273 1801 E melmail@ghd.com

Document Status

Rev No.	Author	Reviewer		Authorisation		
		Name	Signature	Name	Signature	Date
A	K.Milburn / P. Joyce / G. Flower	D. May	*DM	D. May	*DM	10.09.11
B	K.Milburn / P. Joyce / G. Flower	D.May/G. Cater	*DM/*GC	D.May	*DM	24.10.11
C	K.Milburn / P. Joyce / D.May	D.May/S. Graham	*DM/*SG	D.May	*DM	21.11.11
D	K.Milburn / P. Joyce / D.May	D.May/S. Graham	*DM/*SG	D.May	*DM	29.11.11
E	K.Milburn / P. Joyce / D.May	D.May/S. Graham	*DM/*SG	D.May	*DM	8.12.11
F	K.Milburn	D.May	*DM	D.May	*DM	25.01.12
G	C.Missio	S.Graham	*SG	D.May	*DM	04.06.12
H	C.Missio	S.Graham	*SG	D.May	*DM	18.06.12
H	C.Missio	S.Graham	*SG	D.May	*DM	04.07.12

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