

Spring Creek

CATCHMENT PLAN

■ *A guide for managing and enhancing the natural assets of the Spring, Jan Juc and Deep Creek catchments in Victoria's Surf Coast Shire*



Spring Creek Catchment Plan

This publication has been prepared by the Spring Creek Catchment Committee under funding from the Commonwealth Natural Heritage Trust. The Catchment Committee was commissioned from a public meeting convened by the Surf Coast Shire.

The Plan is intended to be of assistance to all people with land management responsibilities in the Spring Creek, Jan Juc Creek and Deep Creek catchments. The Spring Creek Catchment Committee, EnPlan Australia Pty Ltd and all involved in its publication do not guarantee that the publication is without flaw of any kind or that it is wholly appropriate for the particular purposes of individuals. They therefore disclaim any liability for any error, loss or other consequences which may arise from reliance on information in this publication.

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In all cases, individuals or organisations are advised to seek professional advice or assistance for issues emanating from this document that are of interest or concern to them.

The document has been prepared with the Spring Creek Catchment Committee by:

EnPlan Australia Pty Ltd
Environmental Planning and Systems
96 Yarra Street
Geelong Victoria 3220

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Photographs: Graeme A David

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PART 1

The Spring Creek Catchment

1	Introduction	3
2	The future we want	
2.1	Purpose of the plan	4
2.2	What is important?	4
2.3	Why bother?	4
3	What we have now	
3.1	Introduction	5
3.2	Climate	5
3.3	Vegetation	6
3.4	Plant growth	7
3.5	Land systems	7
3.6	Watercourses, wetlands and drainage	15
3.7	Public reserves and sites of environmental significance	17
3.8	Private land sites of environmental significance	19
3.9	Fauna	19
3.10	Pest plants and animals	21
4	Land use: Then and now	
4.1	Land use types	24
4.2	Agricultural development	24
4.3	Change to other uses	24
4.4	Native vegetation retention	25
4.5	Urban expansion	25
5	Issues for the catchment	
5.1	How will the land change?	27
5.2	Duty of care and the right to use land	28
6	What is already being done	
6.1	Surf Coast Shire planning	30
6.2	Other Shire initiatives	35
6.3	Catchment Plan links to other regional and local initiatives	36
6.4	Community action	36
7	How do we get there?	
7.1	Priorities	38
7.2	The Spring Creek Catchment Committee	39

PART 2

FOCUS 1: Nature conservation

Objective	43
Vision	43
Needs	43
Opportunities and threats	43
Action	45
Priority actions	45
What can I do to help?	45

FOCUS 2: Water quality and waterway health

Objectives	51
Vision	51
Opportunities and threats	51
Action	53
What can I do to help?	54

FOCUS 3: Productive land management

Objective	59
Vision	59
Opportunities and threats	59
Actions	60
What can I do to help?	60

FOCUS 4: Catchment amenity

Objective	65
Introduction	65
Landscape quality	65
Air quality	65
Visibility objectives for local areas	66
Greenhouse	66
Separation distances and odour management	66
Prescribed burning	66
Domestic solid fuel heating	67
Main references	67
Noise	67
Heritage	68
Access to natural heritage areas	68
Aboriginal cultural heritage	68

Appendices

Appendix 1: Acknowledgements	75
Appendix 2a: State legislation most relevant to the Spring Creek Catchment Plan	76
Appendix 2b: Key Sections of relevant Acts	78
Appendix 3: Federal, State, Regional, and Local Strategies, Plans and publications relevant to the Spring Creek Catchment Plan	81
Appendix 4: Vegetation Species	83
Appendix 5: Aboriginal heritage information	85
Appendix 6: Contacts	86
Appendix 7: References	88

Figures

Figure 1: Spring Creek Catchment location map	3
Figure 2: Rainfall average at Bellbrae over the past 20 years	5
Figure 3: Spring Creek Catchment map	11
Figure 4: Ecological Vegetation Communities of the Spring Creek Catchment	20
Figure 5: Shire Planning Scheme Land Use Zones Map	37

Plates

Bellbrae in the central Spring Creek Catchment	i
Plate 1: Aerial photograph: Spring Creek Catchment	2
Plate 2: Gherang Gherang Land System (Upper catchment areas)	12
Plate 3: Anglesea Land System (Mid–upper catchment)	12
Plate 4: Bellbrae Land System (Mid–lower catchment)	13
Plate 5: Paraparap Land System (Torquay North area)	13
Plate 6: Vickerys Road in the mid–upper Spring Creek catchment	23

Tables

Table F1.1: Priority actions for nature conservation	46
Table F1.2: What can I do on my land for nature conservation?	50
Table F2.1: Priority Actions for Water Quality and Waterway Health	55
Table F2.2: What can I do on my land to improve water quality and waterway health?	58
Table F3.1: Priority actions for productive land management	61
Table F3.2: What can I do on my land to improve land productivity?	63
Table F4.1: Priority actions for improved catchment amenity	70
Table F4.2: What can I do on my land to improve catchment amenity?	71

Key abbreviations

The following key abbreviations appear in this document.

Abbreviation	Full title
AAV	Aboriginal Affairs Victoria
CCMA	Corangamite Catchment Management Authority
DNRE	Department of Natural Resources and Environment*
DSE	Department of Sustainability and Environment
EPA	Environment Protection Authority
FFG	Flora and Fauna Guarantee (as in FFG Act 1988)
MSS	Municipal Strategic Statement (ie: in Shire Planning Scheme)
SCCP	Spring Creek Catchment Plan
SCCC	Spring Creek Catchment Committee
SRW	Southern Rural Water
WRCC	Western Region Coastal Council

* On 9 December 2002 DNRE was split across the new Department of Sustainability and Environment and the Department of Primary Industries. As details of the change are still in refinement at the time of publication, all references to DNRE have been retained. The new DPI is now the provider of most service delivery in the local area.

Foreword

The Spring Creek Catchment Plan provides a guide for the enhancement and protection of the natural assets of the Spring, Jan Juc and Deep Creek catchments. Its purpose is to assist all stakeholders to play a constructive role in maintaining the catchment in a condition that continues to make it a desirable place to live in, and to ensure that the range of uses to which it can be put are not diminished over time. The Plan also provides current priorities and day-to-day management actions, needed to contribute to achieving this objective. It has been prepared by the Spring Creek Catchment Committee in collaboration with the community.

The Plan area includes some of Victoria's most populated and popular coastal areas. It also contains some of the State's most picturesque rural landscapes that accommodate traditional broadacre and intensive agriculture, and rural residential land uses. It contains extensive public and private lands that retain important natural habitat and public space.

The nature of the area has changed greatly over the past 150 years, and changes will continue to occur. The production of the Catchment Plan is therefore one step in the long continuum of land use and management of the area. Its ongoing value depends on both:

- the cumulative guidance it can provide to the catchment's many land owners on the principles and practice of good catchment management aimed at protecting and enhancing natural assets; and
- the extent by which its objectives and actions can be driven through the identification and implementation of opportunities and projects.

The Plan provides the base framework for this to occur.

We strongly urge residents to contribute to the future of the area by putting into practice the philosophies and actions contained within this catchment plan.



Keith Grossman
Chairman
Spring Creek Catchment Committee

PART 1

The Spring Creek Catchment

T Introduction

1.1 Where is the Spring Creek Catchment?

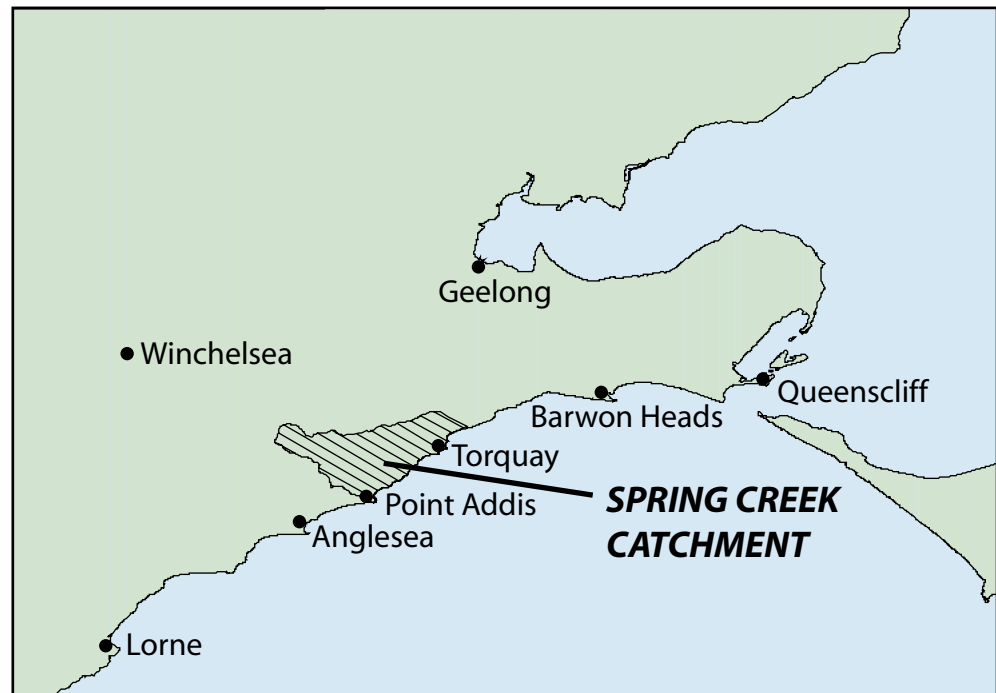
The Spring Creek Catchment Plan area covers a triangular area of approximately 80 km², 20 km south of Geelong, and from the coast at Torquay/Jan Juc to west of Bellbrae. It includes the sub-catchments of Spring, Jan Juc and Deep Creeks.

The catchment's coastal boundary stretches approximately 13 km from 3.5 km north-east of central Torquay to Point Addis approximately 9 km to the south of Torquay.

- The northern boundary runs inland for 18 km through farmland and former farmland now extensively redeveloped for low-density rural residential use. This boundary abuts the larger Thompsons Creek Catchment, which is mainly rural, with little urban development.
- The south-western boundary abuts forest for virtually the whole of its length.
- The south-eastern boundary is the coastline. It includes high cliff faces to the south, and coastal dunes and salt marshes to the north.

Other feature maps of the catchment are provided in later sections of the Plan.

Figure 1: Spring Creek Catchment location map



2 *The future we want*

2.1 Purpose of the plan

The future needed for the Spring Creek Catchment is one in which the catchment's natural assets are protected and sustained through strong environmental, economic and social values.

This plan provides a framework to work towards that future.

The Plan has been prepared by the Spring Creek Catchment Committee on behalf of the Surf Coast Shire, with funding from the Commonwealth's Natural Heritage Trust.

2.2 What is important?

Many of the catchment's natural assets remain, despite much land use change over the past 150 years. Changes will continue to occur, and it is important to maintain and enhance those assets which contribute greatly to the catchment's appeal as a place to live in.

To achieve this, we need to;

- identify priorities and programs for attention; and
- accelerate project action by working together as a community and by improving access to funding sources.

Although levels of community commitment are high and considerable progress has been made to date, much remains to be done. Priority actions and good day-to-day actions are identified in Section 2 of the Plan.

2.3 Why bother?

The catchment contains some of Victoria's most popular and diverse coastal locations. It contains attractive coastal hinterland, including extensive forested public lands and coastal dunes and cliffs with important flora and fauna diversity. It also includes remnant native vegetation along streams and roadside reserves which provide landscape appeal, and important corridor habitat for the movement of native birds and animals.

While the streams are not used for domestic or industrial purposes, their good condition is essential to the catchment's amenity and nature conservation values. Likewise, good water quality is necessary to maintain public health and in-stream biodiversity values.

Proximity to Geelong, Melbourne and neighbouring coastal locations are also important attributes of the catchment.

As a result of the above, the catchment is highly valued for permanent and holiday living, and for a wide variety of recreational pursuits. The inevitable resulting population increases place significant and growing pressures on its natural assets.

While agriculture has dominated land use in the past, the broad scale agricultural landscape has been progressively replaced by rural residential and expanding urban development, with increased public access to sensitive areas. Recent emergence of more intensive forms of agriculture, horticulture and viticulture are also likely to continue and expand. These trends are likely to place collective strain on the catchment's natural assets.

Enhancement and protection of the catchment's assets will not be achieved without ongoing coordinated commitment from all sectors of the community. The assets should be valued and managed by the entire community if their values are to be maintained into the future.

3 What we have now

3.1 Introduction

This section overviews the Spring Creek Catchment's natural features and environmental processes, to set the scene for better understanding of the catchment's management needs.

3.2 Climate

The climate of the Torquay/Surf Coast area generally, together with the sea environment, has been a major factor in the historic and increasing popularity of the area for recreation and as a place to live. The warm, dry summers are conducive to coastal recreational activity on which the popularity of towns such as Torquay and Anglesea to the south has developed. The emergence of Torquay as the 'Surfing Capital of Australia' is closely tied to this.

Rainfall

The annual rainfall averages range from around 550 mm (21 inches) in the north to 650 mm (26 inches) in the south. The average at Bellbrae in the middle of the Catchment Plan area over the past 20 years is 632 mm. The wettest period is July to October (average monthly rainfall up to 70 mm), with the driest being January to March (average approximately 40 mm per month). Although summer rainfall is relatively low, heavy summer rainstorms can also occur from warm moisture-laden air masses.

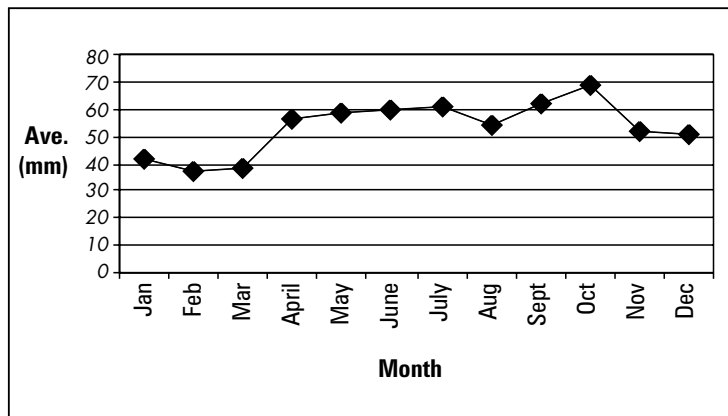


Figure 2: Rainfall average at Bellbrae over the past 20 years

Temperature

Temperatures can exceed 40°C occasionally in summer, mainly associated with northerly winds. Generally, however, temperatures are moderated by the cooling and warming influences of the sea in summer and winter respectively. The warm summer temperatures and long summer days through to March are conducive to beach and coastal activity. They also contribute to a long growing season that extends over much of the year compared to the hotter summer and colder winter climates experienced further inland within Victoria. This has contributed to the buoyant and diverse agricultural history of the area as discussed below.

During winter, the moderating influence of the sea means that sub-zero winter temperatures are uncommon close to the coast, but do occur further inland within the catchment.

3.3 Vegetation

A range of different vegetation types and communities occurred naturally within the catchment. Remnants remain either as extensive or restricted examples, depending largely on historic and current land use. Figure 4 on page 20 maps the natural Ecological Vegetation Classes as described for Victoria's Regional Forest Agreement process. These are not described here in detail as the formal descriptions are for much wider areas than the area covered by this Plan. Descriptions are available via the Department of Natural Resources and Environment (DNRE) offices or from the State DNRE Internet page (www.nre.vic.gov.au). Other descriptions are provided below.

The native vegetation types are strongly associated with environmental features including rainfall, temperatures, soil type, topography, and orientation (i.e. aspect) of the land. Agricultural potential is also strongly associated with these features and there are now fewer remnants of vegetation types associated with higher quality agricultural land types. This is further covered in following discussion on Land Systems.

Road reserves throughout the catchment contain many intact linear remnant samples of vegetation species and communities, including overstorey (i.e. trees) and understorey (grasses and herbs etc.) plants. These reserves are extremely valuable landscape elements as evidence of past land character. They provide habitat and corridors for native bird and animal life and movement, and for insect species. They also provide a gene pool and seed source for the future. The values of roadsides are further identified in section 3.7.

Some parts of the catchment have well described vegetative values. The following description of the vegetation within the valley of Spring Creek is presented in the Surf Coast Shire's 1997 report *'Remnant Roadside Vegetation of the Surf Coast Shire'*

'This area is characterised by an open forest community supporting the dominant Eucalypt forest of Red Ironbark (Eucalyptus sideroxylon sp tricarpa) Manna Gum (E. viminalis) and Messmate (E. obliqua).

Blackwood (Acacia melanoxylon) and Drooping Sheoak (Allocasuarina verticillata) are scattered throughout upper slopes of the zone while the Swamp Gum (E. ovata) and Yellow Gum (E. leucoxyton) are found on lower slopes and drainage lines.

The understorey vegetation is largely dominated by Acacia species with the mid and upper slopes consisting of Lightwood (A. implexa), Black Wattle (A. mearnsii) Golden Wattle (A. pycnantha), Silver Banksia (Banksia marginata) and Sweet Bursaria (Bursaria spinosa).

The vegetation of the watercourses that run from the surrounding elevated hills to the coast, includes Prickly Moses (A. verticillata), Hop Goodenia (Goodenia ovata) and Prickly Tea Tree (Leptospermum continentale).'

The above mentioned Shire report also provides descriptions of vegetation communities on all rural road reserves in the Shire, and lists of all species recorded in those reserves.

Such descriptions are valuable references for residents selecting plants for the Spring Creek valley, and for understanding the diversity and importance of areas.

The lower reaches or estuarine environment of Spring Creek downstream of the location described above, contains the 'Regionally significant' Moonah (*Melaleuca lanceolata*) shrubland, which is also confined to the lower reaches of the Anglesea River to the south of the Spring Creek catchment. This vegetation community is described in the Shire's *'Rural Environmental Study'*. While the vegetation quality of this important community has been degraded due to human pressures, it retains moderate fauna habitat quality. This is important for the Lewin's Rail and Great Egret bird species. Similar intact vegetation is now considered rare in a State context, and may have significant values for fish.

Vegetation lists for the Spring Creek valley and the Point Addis hinterland, as contained in the DNRE document *Indigenous Trees and Shrubs of the West Port Phillip Region* are presented in Appendix 4.

3.4 Plant growth

Different plant species have different growth requirements. However, active growth of most pasture and crop species ceases at below 6°C, slow growth occurs between 6°C and 10°C, and moderate growth occurs above 10°C. Therefore, most of the catchment experiences slow growth of those plants during winter.

During late autumn and winter, rainfall generally exceeds combined evaporation and plant water use (i.e. evapotranspiration). This recharges soil moisture storage for plant growth. Through winter, surplus water also either enters drainage lines as run-off or recharges groundwater reserves. During spring, evapotranspiration rises to exceed rainfall, and stored soil moisture is used for plant growth until it is used up. Deep-rooted species have additional capacity to use soil water, and indigenous trees and other native vegetation within the catchment do not normally exhibit water stress except in prolonged dry conditions. The retention and reintroduction of deep-rooted perennial species where practical across landscapes is important for managing catchment processes. They contribute to the prevention of rising watertables and associated land and water salinity issues. The use of indigenous species provides the added benefit of contributing to habitat values for native birds and animals.

Frost has little effect on local native vegetation species and communities which are well equipped to survive in the local climate.

3.5 Land systems

The Spring Creek catchment contains four main 'land systems'¹. These are areas of land within which the geology, topography, soils, native vegetation and rainfall are similar within designated limits, and to which land use potentials and problems are well matched. The four main land systems represented in the Spring Creek Catchment Plan area are known as:

- Anglesea;
- Bellbrae;
- Gherang Gherang;
- Paraparap.

The locations of the land systems are identified in the overlay to Figure 3. Their names reflect localities in the broader region, on land typical of them. The land systems therefore extend outside of the Spring Creek catchment into the broader region.

The Land Systems are discussed below, moving from the outer margins of the catchment to the lower reaches. The distribution of the land systems is shown on the overlay to Figure 3. Plants are listed only by common name in the text, with their scientific names provided in Appendix 4.

Gherang Gherang Land System (Upper catchment perimeter)

The Gherang Gherang land system forms a flat plateau rim around the perimeter of the catchment from which the valleys of the catchment have eroded. The Great Ocean Road is located on this land system for much of its length between Anglesea and Bellbrae, and also from Bellbrae towards Torquay, to a point where the road descends into Torquay from the west. It is the flattest and least fertile land in the catchment with land slopes typically varying between 0 and 8%.

The surface soils are permeable, inherently infertile, deeply weathered sands with low water holding capacity, from which nutrients have been leached to lower profiles. Farming of this land requires more inputs to soil fertility and attention to soil structure to achieve similar production levels to those of other areas.

Native vegetation is primarily a stunted woodland that was traditionally unsuitable for timber milling, but which supported hardwood forestry for fence posts, poles and firewood. Much of the relatively flat uncleared land adjacent to the Great Ocean Road through the Point Addis area to Bellbrae is representative of this system. The remnant vegetation contains important and diverse floristic values that are recognised through reservation of areas for flora and fauna conservation purposes, including Forest Road Flora Reserve.

The soil and vegetation characteristics historically rendered the land less favoured for agriculture than other land systems, particularly where close to the sea. Large portions of the land system east and west of the Great Ocean Road remain as uncleared or sporadically cleared public or private land. However, significant portions of the land system, mainly inland from the sea, including and along the northern boundary of the Spring Creek catchment, in the Elkington Road area, and south of Bellbrae, were cleared and remain used for agriculture mainly for cattle grazing. Considerable low density rural subdivision has also occurred in some areas, resulting in an overall mixed land use across the land system.

Dominant upper storey native vegetation is stunted woodland featuring the following:

- **Crests:** Messmate stringybark, Narrow-leaf Peppermint, Swamp Gum.
- **Slopes:** Narrow-leaf Peppermint, Shining Peppermint, Messmate Stringybark.
- **Broad flat crests and slopes:** Messmate Stringybark, Brown Stringybark, Narrow-leaf Peppermint, Scent Bark.
- **Swales and broad depressions:** Swamp Gum, Manna Gum.

The fungus *Phytophthora cinnamomi* (commonly known as the cinnamon fungus) has been common within this land system causing areas of dead and dying vegetation. The fungus readily attacks grass trees and has potential to cause much damage in the catchment.

Revegetation is not easily achieved within this land system, due largely to its low fertility and low water-holding potential.

Anglesea Land System (Upper valleys)

Within the core of the Catchment Plan area, the Anglesea Land System is comprised of attractive undulating land that sits below the outer rim of the catchment (i.e. Gherang Gherang Land System), inland of Bellbrae. Portreath Road which runs east west through the upper portion of the catchment, bisects this land.

The land system in this area contains a mix of cleared and uncleared land that has been highly favoured for low density rural residential and hobby farm development. This has greatly modified and 'closed up' the agricultural landscape to a denser settlement pattern. Much revegetation has occurred in subdivision areas including that with introduced native species.

The Anglesea Land System also occupies most of the land east of the Great Ocean Road between Bells Beach, through Point Addis, and beyond the Catchment Plan boundary to Anglesea. This land is mainly uncleared, but also contains substantial areas initially cleared for agriculture, that are now extensively subdivided for rural residential use. This portion of the land system is characterised at the coastline by the retreating sheer cliff faces that extend from Bells Beach to Anglesea to provide great scenic attraction to the area. These coastal cliffs experience marine undercutting and exhibit visible landslips and earthflows. The cliffs in the Point Addis area are also noted for their extensive exposed low-grade brown coal seams, which extend west to the coal fields mined by Alcoa at its power station north of Anglesea.

The land system has long straight slopes. Soils vary but include infertile clays, silts and sands that are deeply weathered in the upper slopes, and are prone to gully, tunnel and sheet erosion if poorly managed. Plant nutrient levels are generally low, and the height of the dominant open forest is naturally less than 15 metres. This decreases towards the coast due to the pruning impact of salt-bearing winds.

However, the floristic diversity and conservation values of the land system including its important heathlands and Moonah (*Melaleuca lanceolata*) woodlands is very high, and have been extensively studied. The vegetated public land areas are reserved to protect these values.

Dominant over-storey plant species across the land system include the following:

- **Crests:** Manna Gum, Narrow-leaf Peppermint, Brown Stringybark.
- **Upper slopes:** Messmate Stringybark, Red Ironbark, Brown Stringybark.
- **Mid to lower slopes and drainage lines:** Red Ironbark, Messmate Stringybark.
- **Exposed coastal slopes:** Messmate Stringybark, Drooping She-oak, Red Ironbark.
- **Landslip:** Red Ironbark, Messmate Stringybark, Moonah, Drooping She-oak.

As discussed in Section 3.3, the Moonah communities are important within this system.

The natural occurrence of the Snow Gum (*Eucalyptus pauciflora*) in restricted pockets of this land system, including in the area around the western end of Gundrys Road, is of strong scientific interest. This community is isolated from other Snow Gum communities in Victoria, which are mainly confined to alpine areas above the snow line.

The range of understorey species and plant communities that are equally important to the ecological characteristics of the land system are not identified here.

Bellbrae Land System (Mid-lower catchment valleys)

The Bellbrae Land System characterises the primarily cleared mid to lower portions of the Spring Creek and the Jan Juc Creek catchments from the Bellbrae area through to the coastline between Torquay North and Bells Beach. It is dominated by cleared rolling hills with long slopes and prominent valleys that provide important landscape features.

Good visual examples of this land system include the Bellbrae township and its surrounds, and the land on which Torquay and Jan Juc are sited.

The moderately fertile soils contrast with the inherently more infertile soils of the Anglesea and Gherang Gherang Land Systems. They are derived from limestone and marls, and range from loamy sands to fine sandy loams of up to more than 2 metres deep.

Historically, the soils have been the most favoured for agriculture in the district, and have been used extensively for cattle and sheep grazing and for cropping. However, agricultural use has decreased as the Torquay and Jan Juc townships have expanded. As the landscape has great appeal and is close to Geelong and the coast, land within this land system has been progressively subdivided for low density rural-residential use. The latter has now exceeded traditional agriculture as the main land use on the land system.

As with the Anglesea Land System, the changing land use patterns are accompanied by significant changes to the landscape. These include housing and associated shedding, extensive woody vegetation planting, more intensive fences and associated paddock subdivision, more dams, and external and internal roading.

While soils within the land system are prone to gully erosion and slumping when exposed, there is currently little evidence of active paddock or gully erosion within the land system. Most old erosion sites are now relatively stable under current management regimes. The creek beds are also cut to stable depths and contain thick reed growth. Bare stream banks, however, are subject to erosion and can add silt and turbidity to streams.

The Bellbrae Land System historically supported open forest including the following dominant upper storey species:

- **Upper slopes:** Manna Gum, Red Ironbark, Messmate Stringybark.
- **Mid slopes:** Yellow Gum, Red Ironbark, Manna Gum.
- **Steeper slopes:** Manna Gum, Swamp Gum, Blackwood.
- **Lower slopes and drainage lines:** Manna Gum, Red Ironbark, Yellow Gum, Swamp Gum.

Remnants of the above vegetation associations persist mainly within road reserves and along the creek lines, with some scattered remnant stands and isolated trees in paddocks. These remnants are very important in this landscape, and should be conserved.

Paraparap Land System (Torquay North area)

The Paraparap Land System occupies a small portion of the catchment north of Torquay as approached from Geelong. It mainly exists outside of the Spring Creek catchment, and includes extensive areas of the adjoining Thompsons Creek catchment.

Soils in the land system are deeply weathered and contain sharp differentiation between the upper and lower layers (i.e. horizons). Surface soils are mainly sandy clay and occasional sands. Fertiliser requirements usually include superphosphate, potash, copper and molybdenum.

Topography is moderately undulating, with slopes varying from virtually flat on the lower slopes and valley floors to 10–11% on upper slopes and crests. Remnants of woodlands and open forest occur within reserves, and combined with the topography, provide an appealing landscape.

The land is predominantly cleared for agriculture, mainly for sheep and cattle grazing. Lighter sandy soils have been used extensively for potato growing, and are subject to wind erosion where the surface is exposed. Torquay North has extended into this land system, including the area occupied by the Surf Coast Shire office and the new Torquay Primary School. Parts of the land system are intensively subdivided and are designated for future urban expansion.

Remnant roadside vegetation provides important landscape and botanical values in this land system, and provides insight into the past appearance of the land and composition of its vegetation associations.

Native vegetation is defined as Open Forest to Woodland and Low Woodland containing the following dominant overstorey species:

- **Crest and Upper slope:** Manna Gum, Swamp Gum, Snow Gum, Blackwood.
- **Middle slope:** Manna Gum, Swamp Gum, Drooping She-oak, Black She-oak.
- **Lower slope:** Swamp Gum, Manna Gum, Drooping She-oak.
- **Valley floor:** River Red Gum, Manna Gum, Blackwood.

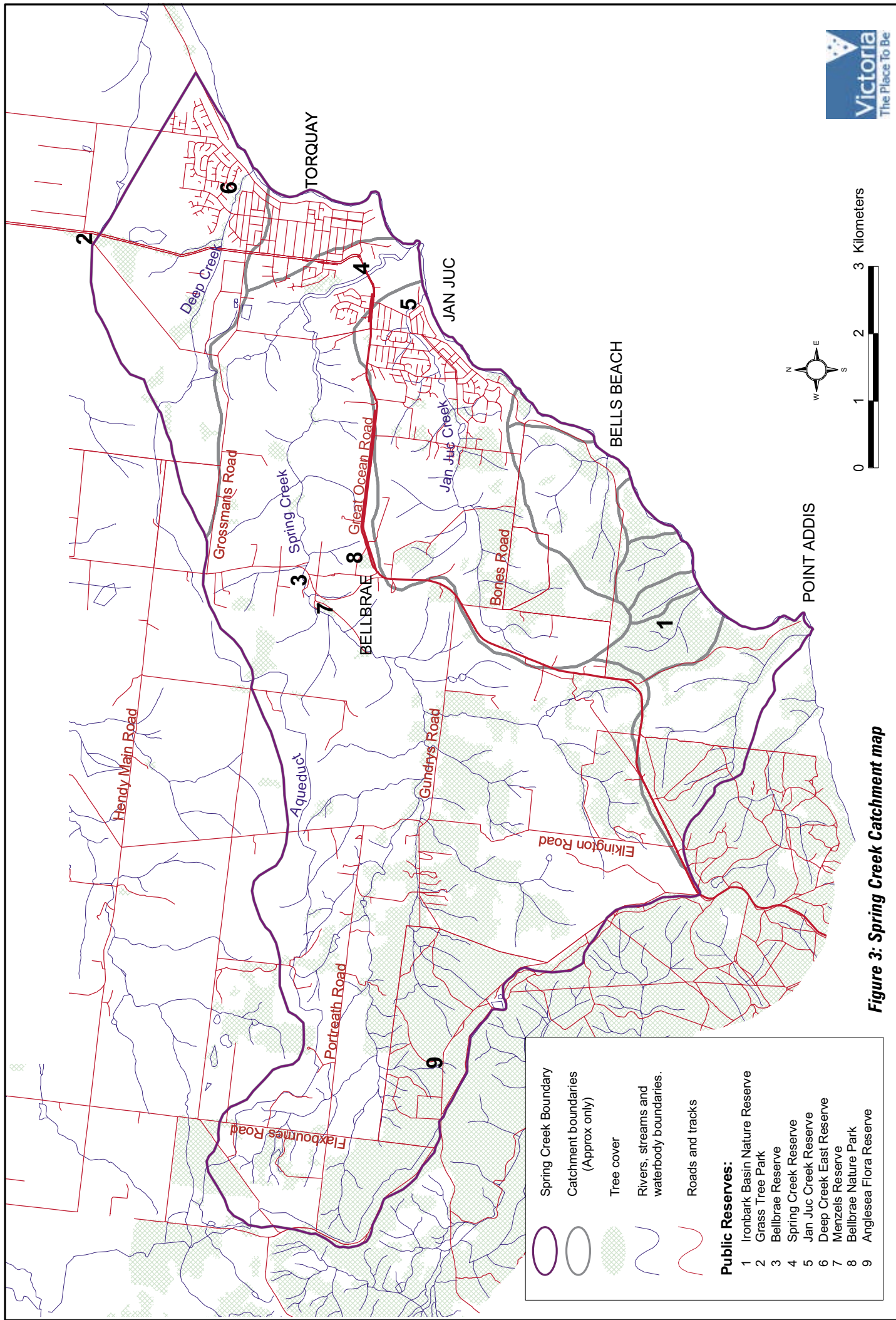


Figure 3: Spring Creek Catchment map

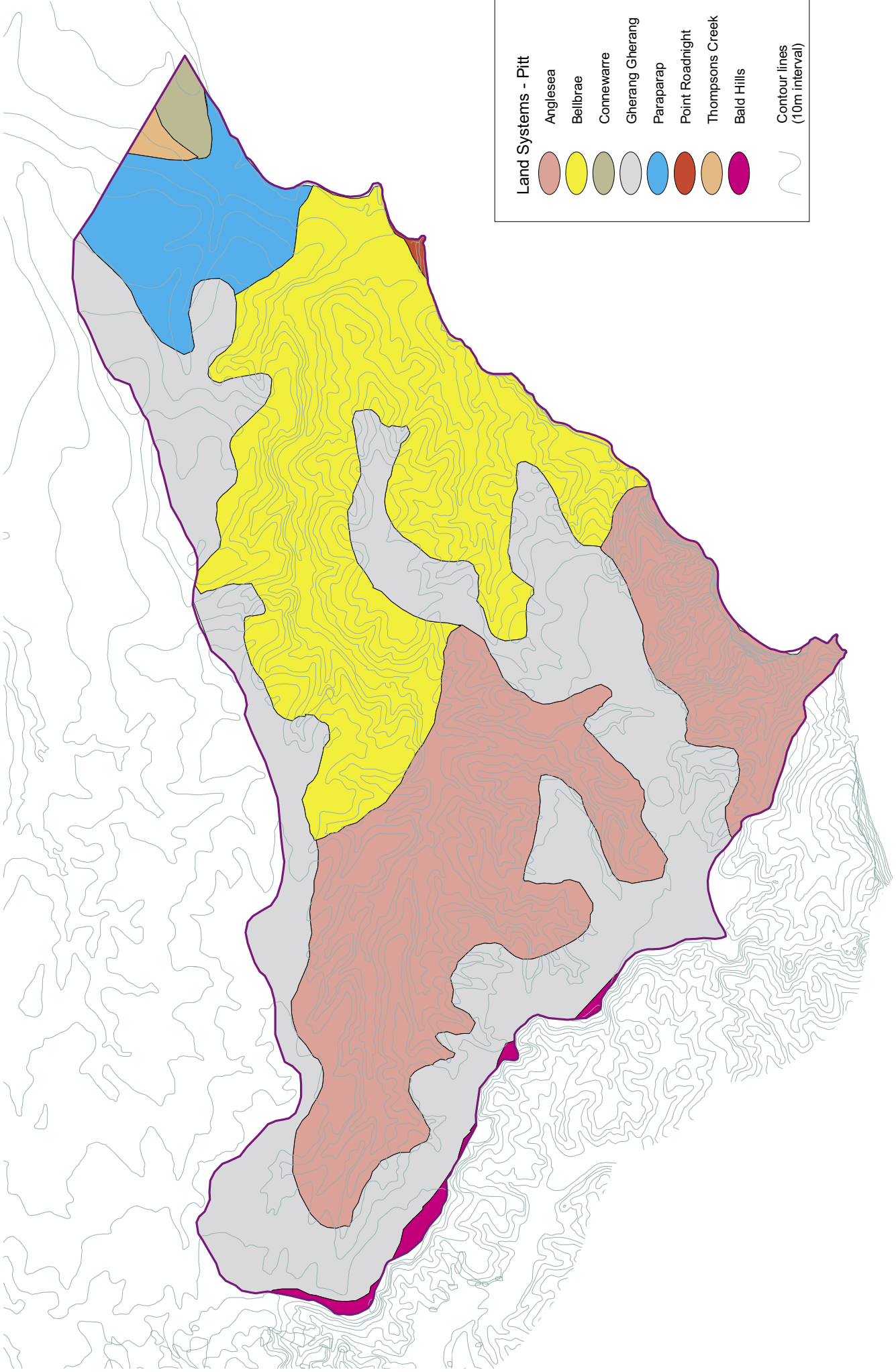


Plate 2: Gherang Gherang Land System (Upper catchment areas)



This land system surrounds the upper Spring Creek catchment as a flat plateau. The land mainly supports native bushland and agriculture, but other uses including commercial Blue Gum forestry and equestrian activity are emerging as pictured in this photograph.

Plate 3: Anglesea Land System (Mid–upper catchment)



This steeply undulating land system has been used mainly for agriculture and retains significant areas of native bushland. The land system has high landscape appeal and within the catchment much of it has been subdivided and developed for low density residential living and hobby farming. Interface with the sea is characterised by steep cliffs, including those at Bells Beach and Point Addis.

Plate 4: Bellbrae Land System (Mid–lower catchment)



This land system is more open than the Anglesea Land System. It has been mainly cleared and successfully used for agriculture. Jan Juc, Bellbrae and much of Torquay are located on the land system and pressure continues for expansion of residential development from those towns as seen in this photograph. Jan Juc Creek and the lower reaches of Spring Creek pass through this land system. Ocean views occur from elevated positions.

Plate 5: Paraparap Land System (Torquay North area)



This gently undulating land system occupies the northern section of the catchment on the approach from Geelong. It is predominantly cleared and its sandy soils have been used for agriculture and allied activities including potato growing. It forms much of the Deep Creek catchment and has been encroached on by the northerly expansion of Torquay.

Adjoining Land Systems

Two smaller land systems, the Coastal Dunes (or Point Roadknight), and Connewarre, occur on the coastal fringe, immediately adjacent to the area covered by this plan. While not formally in the plan, their descriptions are included because they complete the link with the immediate coastline. The Bald Hills Land System abuts the upper southern boundary of the Spring Creek Catchment, and the Thompson's Creek Land System just touches into the Deep Creek Catchment at Torquay North. Neither of these are described in this document.

The Connewarre and Thompsons Creek Land Systems are both extensive in the adjoining Thompsons Creek Catchment Plan.

Coastal Dunes Land System

This Coastal Dunes Land System (formally named the Point Roadnight Land System) is widely distributed along Victoria's south-west coast, but is confined in the plan area to the immediate beachfront between Torquay and Jan Juc, and at Torquay North adjacent to The Boulevard.

The foredune and secondary dunes are of unconsolidated sand, and indicate an advancing coastline (as distinct from adjacent cliffs which indicate an eroding coastline). While the dune systems are not formally part of the water shedding catchment, they are a very important element of the landscape that is acutely sensitive to human pressures. Dune vegetation is sensitive to trampling and disturbance, and where vegetation damage occurs to expose the land surface, the loose sands are extremely susceptible to wind erosion. Large 'blowouts' are common where this has occurred, requiring expensive remedial measures.

Coastal management authorities devote much effort to protect dune systems. Standard management practice within populated areas is to confine vehicle and foot trafficking to designated paved or boarded walkways, and to revegetate denuded dune areas with appropriate cover species to achieve initial stability. In some areas, such as the Torquay main beach, the dunes are vegetated with non-preferred grass species to retain stability under heavy use pressures.

Plant species common within the land system include:

- **Foredune:** Tussock grasslands including Hairy Spinifex, New Zealand Spinach.
- **Shifting dunes:** Coast Everlasting, Coast Beard-heath.
- **Older more stable dunes:** Moonah, Coast Tea Tree, Coast Beard-heath, Sallow Wattle.
- **Interdune corridor:** Coast Everlasting

Not all of these species are expected to be within the small section of this Land System adjacent to the Catchment Plan area.

Connewarre Land System

The Connewarre Land System enters the far north-eastern extent of the catchment plan area beyond Torquay North, and within the newly created Torquay Sands golf course and residential development area. It intrudes here from the Breamlea area and further north to Lake Connewarre.

This land system is characterised by brackish low-lying swampy marshes: in this instance immediately behind the coastal dune system. Land elevation is at or below sea level, and the land is susceptible to inundation and waterlogging. Watertables sit at or above the land surface. The land is generally colonised by halophytic (i.e. salt and excess water tolerant) shrubs and herbs on structureless grey silty clay soils. Slight undulations across the land surface have considerable impact on the micro-environment, expressed through variations in plant type and land suitability.

While considered of little value in the past, the swamps provide valuable wildlife habitat, including for the Orange Bellied Parrot, and Lake Connewarre further to the north is a major State Game Reserve. The area of the land system immediately abutting the north of the Catchment Plan area has considerable local botanical significance.

The land system is very much at the 'receiving end' of the system, and its environmental values are potentially susceptible to catchment drainage water quality issues, and impacts of human activity.

Plant species native to this land system include the following:

- **Areas occasionally inundated:** Low shrubland containing Shrubby Glasswort and Chaffy Saw-sedge.
- **Lower regularly inundated areas:** Closed grassland containing Southern Sea-heath, Creeping Brookweed, Shrubby Glasswort.
- **Area adjacent to sand dunes:** Sedgeland predominantly containing Knobby Club-rush.

3.6 Watercourses, wetlands and drainage

The catchment contains three main drainage systems (Spring Creek, Jan Juc Creek and Deep Creek) and three minor systems south of Jan Juc between Bells Beach and Point Addis. The catchments are mapped in Figure 3 (page 11 of this Plan).

The Spring Creek catchment covers about half of the Catchment Plan area. The Deep Creek and Jan Juc Creek catchments each cover about one-tenth, and the aggregated area of the other systems around one-quarter of the total area.

The undulating topography is not broadly conducive to large area wetlands, and the Catchment Plan area does not contain any internationally significant wetlands.

Streamside vegetation is very important for stream stability and water quality, and indigenous streamside vegetation can provide important habitat and habitat corridors.

Spring Creek

The headwaters of Spring Creek commence as two main branches within the Gherang Gherang and Anglesea Land Systems, west of Bellbrae. Significant areas of both components remain largely uncleared and predominantly within the Anglesea Flora Reserve. The Anglesea Land System component, which occupies much of the upper section of the catchment, remains approximately one-third uncleared, with much of that being on private land. Both headwater branches lie partially within both land systems, before merging to pass through the largely cleared Bellbrae Land System.

Narrow vegetation stands flank Spring Creek along parts of its cleared length. Sections of the creek between Gundrys Road and the creek's outlet at the southern end of the Torquay surf beach are included within an Environmental Significance Overlay (ESO) under the Shire Planning Scheme. The ESO, which is not applied west of Gundrys Road, covers 50 metres either side of Spring Creek.

The purposes of the ESO (as stated in the Shire Planning Scheme) are broadly to protect:

- native fauna habitat;
- the free flow features of the waterway;
- water quality; and
- any aboriginal and non-aboriginal cultural features.

It is also intended to encourage restoration, regeneration and revegetation with indigenous species.

Spring Creek is contained within a well-defined valley land system for its entire length. This minimises potential for flooding outside of the immediate flow path. The broadacre catchment is in sound condition with only isolated evidence of active soil erosion. The condition of the creek floor is also now stable. However, the moderate to steeply undulating catchment topography results in rapid run-off in main rainfall events, and rapid fluctuations in stream flow and flow speed.

The Corangamite Catchment Management Authority (CCMA) has identified stream frontage management as a significant management issue along Spring Creek, including control of stock access and grazing, proximity of cropping and retention of streamside vegetation communities.

As discussed in previous sections, the Spring Creek catchment has had great appeal for a wide range of uses and land use patterns, and associated landscape characteristics continue to change. The most evident visual change with potential to impact on the creek is intensive urban development at Torquay. The creek reserve through this area can provide an important buffer to the impacts of this development, and needs to be well managed.

The broader catchment is likely to become increasingly revegetated, resulting from low density rural residential and hobby farm development, and urbanised to the extent that Shire planning policies will permit. The landscape will tend to become less open and agricultural as a result.

Water quality information is collected at four sites on Spring Creek by the Waterwatch program convened by Barwon Water. Data covers salinity levels, turbidity, phosphorus, pH and dissolved oxygen. Key messages from Bellbrae in the middle of the catchment are that:

- Salinity levels range from 3000 mS/cm to about 11,000 mS/cm depending on the mix of saline groundwater infusion and surface water run-off into the creek. (The unit mS/cm is measure of electrical conductivity which provides an indicator of salinity levels. Sea water is about 30,000 mS/cm).
- Nutrient levels (e.g. phosphorus) vary but within the Eastern Coastal Plains of the Corangamite Region are generally not regarded as high priority for attention within the region.
- The pH is neutral to slightly alkaline.
- Turbidity levels vary, probably in part associated with rainfall events, and are likely to be reduced by the filtering effect of reed beds along the creek floor.

Further information is available for Barwon Water's Waterwatch convenor at Geelong. (See contact details in Appendix 6).

Jan Juc Creek

The Jan Juc Creek catchment lies almost entirely within the Bellbrae Land System, between the Great Ocean Road and the coast. The Great Ocean Road runs along the ridgeline that forms the northern and western catchment boundary. The catchment is moderately to steeply undulating, and for most of its length the creek line is clearly defined.

Jan Juc Creek has two main headwater branches, with the primary stem flowing from west to east through Jan Juc. The outlet to the sea is at the Jan Juc surf beach, adjacent to the Torquay Golf Club. The golf club diverts water from the creek into a large storage dam on the golf course to supplement its fairway watering system.

Land use is both rural residential and broadacre farmland in the upper catchment, while the intensively developed Jan Juc occupies its lower end. Car parking at the lower end also presents potential water quality issues if or where storm water run-off is contaminated from a concentration of cars and litter.

In Jan Juc, the creek passes through a broad reservation that serves also as a passive recreation area. The creek is not cut into the landscape here. Considerable tree planting has occurred to create an attractive outlook from houses backing onto the reserve, which has potential to be developed into a significant habitat corridor. Care is needed to prevent 'garden escape' infestations in such areas, and those plants should be replaced preferably with local native species where present. It also follows that remaining high quality vegetation including Moonah woodland in the Jan Juc area is likely to come under increasing human use pressure and may require specific management attention.

Like in the Spring Creek catchment, the moderate to steeply undulating landform of the Jan Juc catchment creates rapid run-off in main rainfall events and rapid fluctuations in stream flow. This can cause short-term minor flooding in the lower reaches of the creek.

The creek estuary at Jan Juc requires occasional breaching to flush out stagnated water and any accumulated pollutants. However, water quality information is not formally collected for Jan Juc Creek.

Deep Creek

Deep Creek enters the sea at the northern extremity of Torquay. Its catchment consists predominantly of farmland north of Torquay within the Paraparap Land System. It extends inland across the Surf Coast Highway immediately north of the entrance into Torquay from the north, and into the Gherang Gherang Land System. The land and native vegetation characteristics are as described for the respective land systems.

Most of the catchment has been cleared for farmland; however, the lower catchment is now primarily covered by residential development. Remnant vegetation is now largely confined to road reserves and the creek line, and there is active erosion and extensive infestation of the creek environs by various garden escapees through the township area. The eastern end of Coombes Road and adjacent private land within the Deep Creek catchment contain locally significant remnant Messmate Heathy Woodland.

There is no formal ongoing water quality information for Deep Creek, but the CCMA regards water quality (pollutants from run-off from roads and carparks, and nutrients from gardens and lawns) to be a management issues for the creek.

Precise definition of the catchment boundary is difficult in the Torquay North area due to the flat topography, and minor variations occur in the maps in this document.

3.7 Public reserves and sites of environmental significance

The Catchment Plan area contains important public land reserves within its rural and urban areas, ranging from large forested conservation areas through streamside and road reserves to small public parks containing remnant indigenous vegetation and, often, introduced species. Beachfront areas including coastal dune systems and cliffs are also extremely important and sensitive public reserves that are subject to intensive population pressures. As previously identified, the dune systems are not covered in this plan as they are to be included in broader coastal strategies and plans.

As identified in section 3.5, the large woodland parks remain in their native condition largely due to infertile soils with low water holding capacity. These lands are of inherently lower agricultural value than other parts of the catchment. However, as with streamside, road reserves, coastal wetlands, and potentially beach reserves, they contain important floristic and habitat values. They also provide important heritage links with the landscape as it used to be, and can provide genetic material for future uses.

All public lands within the catchment have been reviewed by the former Victorian Land Conservation Council, and have been allocated public reserve and conservation status consistent with their values. The status designations may be periodically reviewed and altered into the future.

Both the Department of Natural Resources and Environment (DNRE) and the Surf Coast Shire have identified environmentally significant sites within the Plan area, including sites on private land. Many of the sites coincide with largely-intact remnant vegetation areas in road reserves, and some contain rare or threatened species. The sites are identified in the Surf Coast Shire's *'Rural Environment Study: Interim Report on Environmental Resources'* and the Shire's subsequent *'Environment and Conservation Plan.'* Periodic surveys and reviews of significant sites and species are needed to ensure ongoing protection and enhancement of local values.

Environmentally significant public sites, identified within the environmental resources study include the following:

- **Coastal areas between Jan Juc and Point Addis** (and further outside of the Spring Creek Catchment Plan area) including **Ironbark Basin**. This reserve is part located within the Spring Creek catchment along its southern boundary. The Ironbark Basin is recognised for the scale and significance of the floristic and habitat diversity of its remnant ironbark forest. The *Ironbark Basin Nature Reserve Draft Action Plan* was released in 2000, but a final plan is not yet endorsed.
- **Lower Spring Creek** is important for its Moonah shrubland and (degraded) riparian vegetation. These values are potentially threatened by pressures associated with urban development.
- **Grass Tree Park** at the intersection of the Surf Coast Highway and Messmate Road, north of Torquay is significant for its high quality and State significant Graminoid Heath vegetation type, and low to moderate fauna habitat. Although invaded by Coastal Teatree in its northern section, Grass Tree Park is protected by a Conservation Covenant to ensure that its environmental assets are not destroyed. A *Grass Tree Nature Reserve Draft Action Plan* was completed in early 2000.
- **Road reserves (and some private lands) north-west of Jan Juc** provide potential Yellow Gum habitat for the nationally-significant Swift Parrot.
- **Menzels Nature Reserve, Bellbrae** is important for its Manna Gum Grassy Woodland, which is currently substantially degraded. The draft *Menzels Nature Reserve Draft Action Plan* was prepared in 1999.
- **Forest Road Flora Reserve** (and adjacent private land) is important for high quality intact vegetation characteristic of the Gherang Gherang Land System, and habitat for significant animal and bird species.

As identified, draft Action Plans have been prepared for several of the above sites (eg. Ironbark Basin, Lower Spring Creek and Grass Tree Park) under the Shire's *Environment and Conservation Plan* to protect their important designated natural assets. Specific values are described in these documents.

Further, the environmental values of all of the Spring Creek Catchment's rural road reserves are detailed in the Surf Coast Shire's publication *Remnant Roadside Vegetation of the Surf Coast Shire* (1997) available for viewing at the Surf Coast Shire offices. The report includes detailed plant lists, and environmental ratings are provided for all roads. The well-vegetated roads often provide important habitat corridors for the movement of wildlife between main vegetation areas.

Examples of roads identified by DNRE as sites of environmental significance and by the Shire for special management needs due to their conservation significance include the following:

Addiscott Road*	Grossmans Road
Bells Beach Road	Gundrys Road*
Bones Road	Jarosite Road*
Coombes Road	Kurzmanns Road*
Duffields Road	Messmate Road
Flaxbournes Road*	Minter Drive
Elkington Road*	Nortons Road*
Forest Road*	Point Addis Road*
Grays Road	Vickerys Road*

Those roads marked with * are recorded as containing rare or threatened plant or fauna species which require special attention under Victoria's *Flora and Fauna Guarantee Act 1988*. While not discussed here, the significance of these and all other Shire roads are defined within the Shire's roadside report.

The above roads listing does not infer that other roads in the Catchment Plan area do not contain values worthy of protection and enhancement. All remnant plants and stands of vegetation provide value to the landscape and as with the native fauna they contain, are protected under flora and fauna legislation and council by-laws.

3.8 Private land sites of environmental significance

The Shire's *Rural Environmental Study: Interim Report on Environmental Resources* identifies the private land sites considered of environmental importance. These generally comprise significant-sized stands of remnant vegetation or species of regional or State significance. Management of such lands is largely a private matter within the framework of the State's *Flora and Fauna Guarantee Act 1988*, however, land owners are encouraged to consider the assets from a wider community context and manage them for their protection and enhancement where appropriate.

Victoria's Biodiversity Strategy and the *Draft Regional Native Vegetation Management Plan* provide useful reference guides for this.

Various means are available for the protection of such areas. These include the application of a conservation covenant, and/or an Environmental Significance or a Vegetation Protection Overlay under the Shire Planning Scheme.

Other informal management options include the fencing out of valued areas. With appropriate weed and pest animal management, this can encourage the enhancement or re-colonisation of indigenous fauna and overstorey and understorey species.

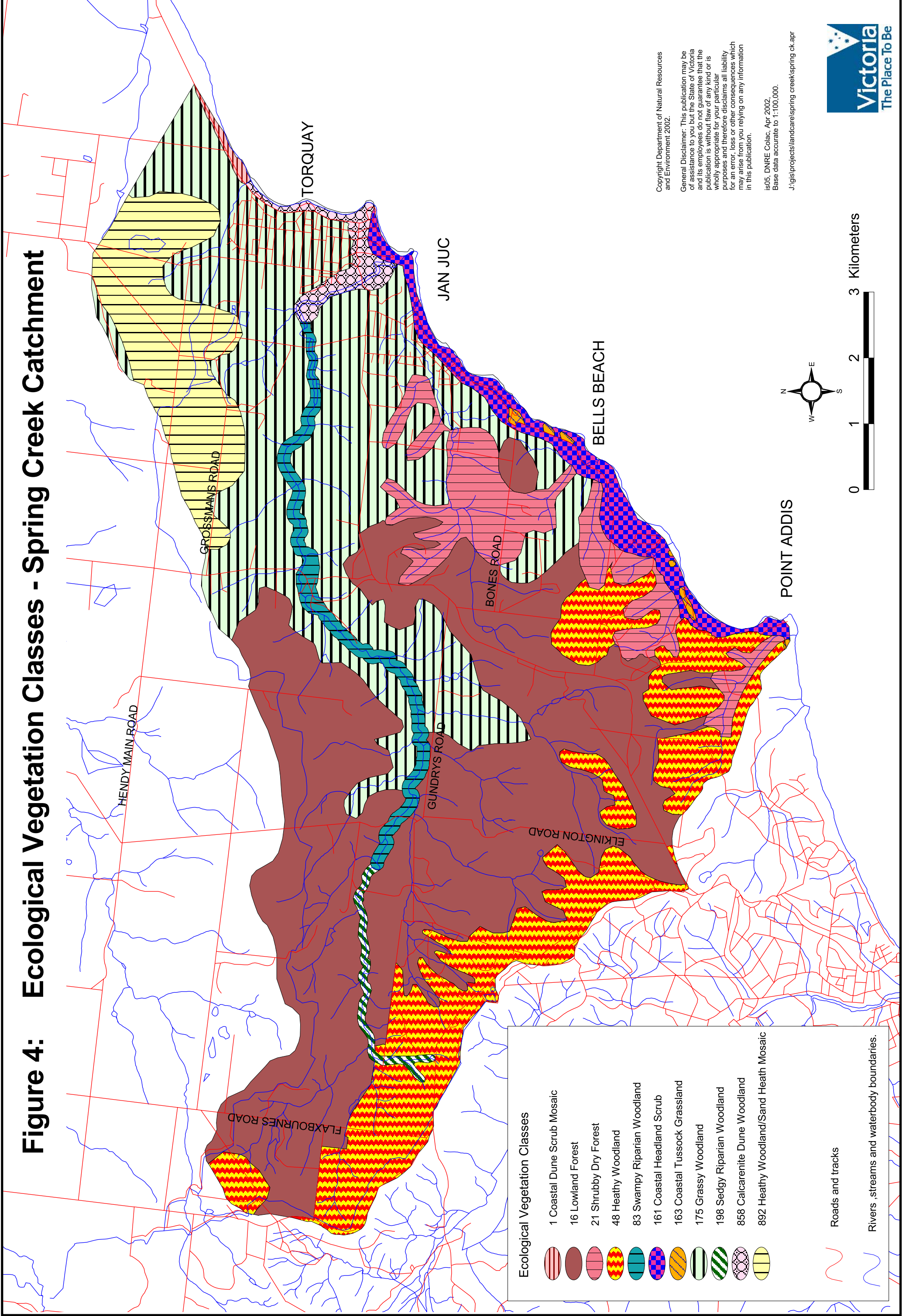
Designation of land under Victoria's *Land for Wildlife* scheme is another option for linking significant lands into the wider property and district environmental management framework. Landowners interested in such reservation or protective actions are encouraged to discuss options with the Shire and DNRE.

The careful management of septic tank systems can also be an important factor, where tanks are located close to valued vegetation sites.

3.9 Fauna

The Surf Coast Environment Study notes the following fauna species associated with, or potentially associated with, the Spring Creek catchment's identified environmentally

Figure 4: Ecological Vegetation Classes - Spring Creek Catchment



Ecological Vegetation Classes

- 1 Coastal Dune Scrub Mosaic
- 16 Lowland Forest
- 21 Shrubby Dry Forest
- 48 Healthy Woodland
- 83 Swampy Riparian Woodland
- 161 Coastal Headland Scrub
- 163 Coastal Tussock Grassland
- 175 Grassy Woodland
- 198 Sedgy Riparian Woodland
- 858 Calcarene Dune Woodland
- 892 Healthy Woodland/Sand Heath Mosaic

Roads and tracks

Rivers, streams and waterbody boundaries.

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significant areas. While clearly not an exhaustive list of the catchment's native fauna, it does provide an overview of species likely to remain within the area, that require protection if the natural assets of the catchment are to be retained and enhanced.

Nationally significant species

- Lewin's Rail (Lower Spring Creek)
- Swift Parrot (Associated with Sclerophyl Woodland)

State significant species

- Grey Goshawk
- Powerful Owl (Various sites)
- Rufous Bristlebird (Ironbark/Stringybark communities including Ironbark Basin, and other sites)

Other species

- Long nosed Bandicoot (various sites)
- Great Egret (Lower Spring Creek)
- Koala (Yellow Gums north of Jan Juc and other sites)
- Tawny Crowned Honey-eater (Grass Tree Park, Torquay)
- White Footed Dunnart (various Brown Stringybark and Red Ironbark Sclerophyl Woodland areas)
- Southern Emu-wren (Manna Gum Grassy Woodland areas)
- Spotted Quailthrush (Forest Road Flora Reserve and elsewhere)
- Eastern False Pipistrelle (Forest Road Flora Reserve area)
- Echidna
- Jackie Lizard (Tree dragon)
- Blue Winged Parrot
- New Holland Mouse (in Forest Road Flora Reserve area)
- Southern Brown Bandicoot (Ironbark/ Stringybark community sites)

State significant fauna are listed under the State's *Flora and Fauna Guarantee Act 1988* and are subject to the preparation of 'Action Plans'. Of the species listed above, Action Plans have been prepared for the New Holland Mouse (Action Statement No. 74) Powerful Owl (AS No. 92) and Rufous Bristlebird (AS No.49). Action Plans are available from the Government Information Centre or from the DNRE Internet page <www.nre.vic.gov.au>.

Many landowners are familiar with a wide variety of other native fauna species within remnant and constructed habitat. As for plants, periodic surveys should be initiated in the catchment as a gauge of catchment health in addition to providing information on individual species.

3.10 Pest plants and animals

The Surf Coast Shire has released a pest plants and animals action plan *Managing Pest Plants and Animals in the Surf Coast Shire: the Surf Coast Shire Pest Plant and Animal Action Plan*.

The above-mentioned plan introduces works covering private and public land including road reserves, and will be refined over time.

All people involved with any level of land management or land disturbance in the Shire should be familiar with the pests plan and its action requirements. Further information is available from the Shire Pest Plant and Animal Officer (See appendix 6 for contact details).

Weeds

A weed is defined in the Victorian Weeds Strategy as 'a plant that has or has the potential to have, a detrimental effect on economic social or conservation values'.

Certain weeds are classified as noxious weeds within Victoria under the *Catchment and Land Protection Act 1994*. All landowners are obliged to control and eradicate noxious weeds on their own properties, and to prevent the spread of noxious weeds from their properties. Primary emphasis now requested on strategic control to prevent infestations, in preference to reactive control once outbreaks have occurred.

The Act also authorises the inspection of properties for noxious weeds and provides for controls on the movement of machinery, the sale of livestock and farm produce that may contain seeds of noxious weeds, and the sale of noxious weeds and their seeds.

Other weed categories including 'Regionally Controlled Weeds' also grow within the Shire.

Major weeds within the Shire affecting agricultural production include but are not limited to Serrated Tussock, Chilean Needle Grass and Gorse.

- Serrated Tussock currently affects and threatens to potentially overtake 130,000 ha of private and public land within Victoria. Infestations occur within the Spring Creek Catchment and as far south as Lorne and Aireys Inlet. Control of this weed is a major thrust of the State's and Surf Coast Shire's weeds strategies. Individual plants produce over 100,000 seeds per year that can remain dormant for up to 15 years.
- Chilean Needle Grass threatens to be as big a problem as Serrated Tussock. It is newly emerging in the Surf Coast Shire generally, and local outbreaks have occurred in the Torquay and Jan Juc areas. It forms dense stands in pasture, native vegetation and roadsides, and can tolerate drought and heavy grazing. Up to 15,000 seeds per square metre can lie beneath infestations, and easily attach to animal coats, clothing and machinery. It can also reproduce even if flowering has been prevented.
- Gorse (or Furze) competes with and displaces indigenous vegetation and pastures to reduce productivity. It is common in road reserves and harbours rabbits and foxes. It can produce millions of seeds per hectare per year. Seeds are ejected when seed pods burst during summer. Seed, which can lay dormant for years, is commonly spread by animals, wind, birds, ants and humans via shoes, vehicle tyres, and road-making activities.

Strategic weed control also requires close cooperation between landowners and the managers of adjoining lands, including the Shire or VicRoads as appropriate for road reserves and DNRE for other public lands.

Environmental weeds

Environmental weeds are plants that invade native vegetation communities, usually adversely affecting regeneration and survival. They may be exotic plants introduced from overseas or native species that have spread outside of their pre-European distribution. In some cases they are indigenous plants that invade and compete against indigenous vegetation communities.

Environmental weeds have potential to alter landscape character and diminish environmental values. The Surf Coast Shire's publication '*Environmental Weeds: Invaders of our Surf Coast*' identifies the more common weeds in the Shire and their appropriate control techniques.

Pest animals

The main traditional pest animals in the Spring Creek Catchment Plan area include rabbits and foxes. The rabbit was introduced to Australia within the local Corangamite Region and its spread and impact are testament to the suitability of local conditions to its survival. Likewise, the fox is ideally adapted to local conditions, and thrives in dense undergrowth areas including creek lines.

Control techniques for both of the above pests are well established and continue to evolve. Landholders are required to adopt control and preventative measures over them.

Major emerging problems within landscapes undergoing urban expansion relate to domesticated, escaped or feral domesticated animals, most notably cats and dogs. Domestic cats naturally prey on small animals and birds and are a major threat to Australian native

species, which generally have few defence mechanisms. Locally, these include endangered New Holland Mouse and the Rufous Bristlebird. The existing threat of feral cats in parts of the catchment has the potential to expand significantly into the future if not well controlled.

The Shire has introduced a cat curfew under the *Domestic (Feral and Nuisance) Animals Act 1994* for all land in the Shire other than the rural zone. The curfew requires cats to be securely contained to the owners premises, between 8 pm and 6 am, and prohibits cats, other than restrained domestic cats, in public areas. Further information is available from the Shire Local Laws Department.

Dogs are also natural hunters that often ‘hunt in packs’. Dogs from urban or rural residential areas adjacent to rural areas pose considerable threat to farm animals. There are many precedents for this, and onus rests with pet owners to ensure that problems do not occur.

Native animals including kangaroos may also be pests when in high numbers. Cleared farming environments are highly altered from natural conditions and can provide additional watering and grazing options. This can contribute to animal populations growing to pest proportions, particularly where conducive climatic conditions have prevailed. This can in turn present difficult management issues in mixed land use areas such as the Spring Creek Catchment Plan Area, containing large adjacent areas of bush and farming land.

As all native animals are protected under State legislation, landowners wishing to control native animal populations or communities need to consult with DNRE on available options.

Plate 6: Vickers Road in the mid-upper Spring Creek catchment



Roadside reserves are important catchment assets. In addition to their landscape values, the reserves can be important as corridors for native wildlife. They can also harbour pest plants and animals, and present fire and safety issues. Good management requires cooperation and attention from all sectors of the community.

4 Land use: *Then and now*

4.1 Land use types

A range of main land uses now dominate the catchment. These include the following:

- intensive urban development;
- extensive low density rural residential;
- subdivision, including tourist and holiday uses such as residential cabins and horse trail rides;
- small farm use (e.g. on 8–10 ha);
- traditional broadacre agriculture (e.g. grazing and cropping);
- intensive agriculture (including horticulture, viticulture, vegetables and flower growing);
- forested land as public reserve (various categories) or private land; and
- plantation forestry (emerging).

Proportions of the above categories have changed substantially over the past three decades, with intensive and rural residential uses expanding rapidly to replace traditional agriculture.

4.2 Agricultural development

The Catchment Plan area was initially selected and settled in the 1840s–1850s with most of the better land occupied by squatters. Good agricultural land was systematically cleared, leaving only the more inherently infertile soils remaining under large areas of native vegetation cover. For the next 100 years, the cleared land was used primarily for agriculture, mainly grazing, while the timbered land of poorer agricultural quality was considered largely worthless as productive land. It was used for a range of low intensity purposes including wood cutting and low-grade forestry.

4.3 Change to other uses

Major land use changes occurred from the 1950s to the 1970s. In the 1950s extensive clearing occurred for agriculture in the Deep Creek and lower Spring Creek catchments.

This was followed in the 1960s and 1970s by improvements to vehicles and roads. Proximity to Geelong and Torquay also began to render land of attractive landscape and relatively fertile soils a prime residential target. Concurrently, the varied floristic and conservation values of the remaining woodlands began to be better recognised, and private ‘bush blocks’ began to gain attraction. These influences led to the subdivision of land for increasingly popular low-density rural-residential use.

As the capital value of land for rural-residential use exceeded that for agriculture, local government introduced minimum subdivision sizes through the planning scheme, to ensure that development occurred in an orderly manner.

Declining terms of trade have also impacted on agriculture since the 1970s.

Within the Catchment Plan area, there is now a reduced number of broadacre farms considered technically viable as agricultural entities. Many farms have been at least partially subdivided for other use, and farming families are less likely than in the past to be totally reliant on farm income.

Similar trends have occurred in many other areas close to main urban centres such as Geelong.

More intensive forms of agricultural and horticultural use, including grape, potato, tomato and flower growing, have also emerged, particularly in friable sandy soils, and significant cultivation close to township zones has occurred for these purposes.

Recent pressure on water authorities to find uses for treated wastewater to eliminate ocean discharge has also led to emerging use of water-intensive enterprises such as flower growing and vineyards. This trend is likely to increase, and will result in more intensive productive use of catchment land.

Another change with potential to substantially impact on land use and landscapes is the emergence of eucalypt plantations (primarily Tasmanian Blue Gum) for the woodchip and saw-log industries. This may emerge as a significant use in the catchment over time.

Clear prediction of future trends in the above uses is difficult however, due to local and potentially international market, economic and consumer variables.

4.4 Native vegetation retention

The area of remnant vegetation has remained relatively unaltered over recent years, while the amount of natural regeneration in broadacre and linear (i.e. road and stream) reserves and on private low-density residential allotments has increased markedly.

Meanwhile, the area planted to woody vegetation either as woodland associated with low-density rural residential development, or shelterbelts and woodlots on farmland has increased. The choice of indigenous vegetation is favoured to provide for future habitat potential and to maintain or enhance the landscape character of the catchment.

The shift from traditional agriculture is occurring across the catchment. The landscape is becoming more closed as planted and regenerated vegetation matures in road reserves and on private land. This in turn carries various associated ancillary and potentially positive or negative resource condition impacts or threats associated with:

- population density and associated road traffic;
- increased recreational use;
- increasing prevalence of domestic animals including dogs, cats and horses, and potentially native animals including kangaroos;
- the construction of more and potentially larger water storage dams;
- enhanced environments for native, and potentially for introduced pest flora and fauna; and
- increased nutrient movement into drainage lines and water courses including from septic tank seepage, stormwater flows, fertiliser use, soil loss and animal access into streamlines;
- potential spillage of chemicals onto broadacre land and into water courses; and
- fire and fire management.

The above points represent main issues for the future management and condition of the land and the catchment's other natural assets.

4.5 Urban expansion

Intensive urban expansion is evidenced by trends in residence numbers and building permits within Torquay and Jan Juc. Both Spring Creek and Jan Juc Creeks enter the sea through expanding residential areas. While the immediate creek lines are reserved as public land, increased urbanisation both directly opens access to the creeks to higher population pressures including general access and use, and to increased stormwater flows off hard-surfaced areas (e.g. roofs, roads, car parks etc.). It also opens access for the undesirable spread of weeds, rubbish dumping and the prowling and escape of pets into the stream environment.

Until recently, intensive urban expansion of both Torquay and Jan Juc was largely contained to the seaward side (i.e. east and south) of the Great Ocean Road. This has now shifted, with more current and future proposed zoned expansion crossing into adjacent hinterland to the west and north of that road, adjacent to and on both sides of Spring Creek. Jan Juc is also expanding further into the Jan Juc Creek catchment.

While the Shire's planning scheme limits the expansion within defined zones, the natural assets of the creeks (i.e. water quality, flora and fauna values of remnant vegetation etc..) are potentially compromised by increasing population and recreational access, and increased stormwater drainage. It is important that the natural asset values of the creeks be considered and enhanced through future planning and development actions.

The potential exists for individual buildings or aggregations of buildings to become more dominant in the landscape. Absence of tree planting in new estates in order to maintain ocean views could contribute to this. This will require ongoing community and planning attention if acceptable balances are to be retained between development and the catchment's valued landscape assets.

5 Issues for the catchment

5.1 How will the land change?

The Spring Creek Catchment Plan area will continue to undergo land use and population changes emanating from those discussed in Section 4. This will continue to exert pressures on the catchment's natural assets, and have potential to impact greatly on the retention and condition of those assets.

Major change types with potential to impact greatly on the catchment's natural asset values include those identified in Section 4. They can be summarised as:

- increasing urbanisation;
- ongoing change from agriculture to low density rural living and associated land uses;
- intensification of agriculture and associated enterprises including horticulture, vegetable growing and forestry, some of which are likely over time to use increasing quantities of treated wastewater;
- increasing recreational and tourism activity, including the development of beach related, golfing, equestrian, accommodation and associated 'country club' type activities; and
- changes to as yet unknown land uses.

It is important that the land assets are maintained in a condition that does not unnecessarily diminish their potential for various future uses. This is sustainable land use.

A range of potential threats accompany current and expected changes. Main examples include:

- loss of native vegetation and associated habitat for native animal species, resulting from land clearance for urban and agricultural development;
- loss of remaining habitat from already cleared land;
- introduction and escape of pest plants and animals onto land and in waterways, including domestic pet species, particularly cats and dogs;
- land degradation resulting from overgrazing, pest infestation, fire and recreational activity;
- declining water quality, including that caused by stock access to waterways, loss of soil and associated nutrients, run-off of nutrients and chemicals from agricultural, horticultural, and residential use and from overflow from septic tank;
- increased stormwater flow rates and volumes issuing from expanded residential areas, with potential impact on waterway health;
- potentially adverse landscape impacts of intensive rural industry (e.g. poultry sheds, extensive hot houses etc.), and urban development;
- conflicts between vegetation retention and fire prevention requirements on vegetated land.

The catchment's natural asset values most threatened by land use change and which require specific attention by the community for current and future generations are as follows:

- productive potential of the land for the full range of uses to which it is likely to be put;
- water quality and stream health;
- native flora and fauna (or biodiversity);
- air quality;
- landscape appeal; and
- cultural assets.

These are the main Focus Issues for developing and implementing the action needs identified in this Catchment Plan. The Focus Issues are further developed in Part 2.

5.2 Duty of care and the right to use land

With ongoing change, it will be necessary for residents living in and using the mixed use catchment for a wide range of purposes, to understand each other's needs, and to cooperate in managing the catchment's assets.

Landholders have exercised their right to subdivide and use the land for a range of permitted uses within respective land use zones. As a consequence, the concepts of what is or is not a farm or a farmer have become ill-defined.

Subdivision of land necessarily means that land will be put to different uses, and that the interactions of people with the land and the environment will change. While this increases land use and landscape diversity, it also increases potentials for conflict between residents. This raises the issues of rights to use land, and duty of care to the environment.

The right to farm or use land, and 'duty of care'

All residents have the right to use the land as permitted within respective planning scheme zones. However, this carries a 'duty of care' to protect the well-being of the environment and of other residents. Environmental management requirements are mainly set in legislation and associated regulations. Local planning scheme provisions and by-laws also introduce limits.

Provided the impacts of introduced or changed land uses are kept within reason and allowable limits, this needs to be accepted by all as a 'trade-off' against landowners' exercised subdivision rights.

Key State legislation covering the management of environmental assets includes the following:

- The Victorian *Catchment and Land Protection Act 1994* requires that landholders take 'all reasonable steps' to ensure that damage to land and to community values associated with the land does not occur. It also requires that resource users should be responsible for repairing any damage caused by their actions.
- Under the *Environment Protection Act 1970*, it is an offence to pollute land, air or water, such that they become noxious or poisonous, harmful or potentially harmful to the health, welfare, safety or property of humans, animals, birds, wildlife, fish or other life, or detrimental to any beneficial use made of those resources. Various prescriptions and guidelines under the EPA Act also clearly define acceptable resource use and management parameters. Penalties are applied for breaches of the Act.

A person is deemed to be a polluter if he or she 'causes or permits any act leading to the above, including the placement of any waste in a position where it could reasonably be expected to pollute water, land, or air'.

- The *Flora and Fauna Guarantee Act 1988* requires protection of native flora and fauna, and prevents the unauthorised capture or sale of native species.
- The *Water Act 1989* legislates over a range of water-related matters pertaining to the storage of water, and the management and use of surface water, groundwater and treated waste water.

Therefore, all rural and urban landowners are subject to some level of regulation and control, as are people involved in most other fields of endeavour, where issues of community good are implicated.

Exercising 'duty of care' basically requires that land managers and users of the environment can demonstrate, if needed, that all reasonable steps have been taken to avoid damage or detriment to the environment or to others.

Land managers need to seek legal advice for formal definitions and interpretations of the concept, if it is an issue to them.

Costs of managing natural assets for private and public good

The sharing of costs for environmental management requires explanation.

It is well established that good natural asset management has associated private and public benefits. For example, it is in the public interest that water quality in streams and water supplies (e.g. nutrient, salinity levels etc.) remains at appropriate levels. It is also a private interest for individual landowners that they have access to good quality water for stock and domestic use.

It is also in the public's interests that biodiversity values are maintained at levels that meet community expectations, and that in the long term, land is able to produce the community's food requirements.

Commonwealth, State and local governments therefore contribute 'public good' investment into programs to encourage or assist landholders to manage land appropriately. This occurs through research funding, farm advisory and community education programs, and various forms of financial assistance (e.g. grants, tax incentives, rate rebates etc.). This is widely accepted and used by landholders, and is a major impetus behind the Landcare movement.

6 What is already being done

6.1 Surf Coast Shire planning

Council decisions relating to land use have a major impact on the amenity of catchments and the management of their natural assets. A major function of the Surf Coast Shire is therefore to ensure that land use change is both strategic and matched to land capability.

The Shire achieves this through its planning scheme across all land in the municipality. The scheme, which conforms to a format required by the State Government, establishes land use zones and specific 'overlays' intended to protect important defined values.

The Shire's planning scheme includes a statement of Government policies known as the State Planning Policy Framework (SPPF). This includes broad State catchment management policies covering waterways, groundwater, floodplains, salinity, air quality, noise abatement, soil contamination, protection from wildfire, coastal areas, native flora and fauna, open space, heritage and energy efficiency.

The planning scheme also contains a Municipal Strategic Statement (MSS) and the Local Planning Policy Framework (LPPF). These statements jointly:

- present a vision to the community, and define key policies relating to land use and development within the municipality;
- identify long term directions about land use and development in the municipality; and
- provide the rationale for applying land use *Zones* over all land, and where applicable, special land use *Overlays* to protect important natural or built features.

Zones and Overlays directly impact on land use.

- Zones have defined objectives and specify permitted and non-permitted uses and those uses and developments for which permits are required.
- Overlays provide additional conditions to special areas, intended to protect either environmental, vegetation, landscape, heritage, built form or site management issues.

As owner onus applies, all land owners and managers should be familiar with the zonings of their land and the obligations accompanying them.

What does the Shire want to achieve?

The Shire's stated vision is for the Surf Coast to become one of the best known regions of Australia. In achieving this, it also wishes to:

- protect and conserve natural assets;
- enhance quality of life;
- provide for limited population expansion;
- provide for a major tourism destination; and
- develop sustainable primary industries across agriculture, horticulture and forestry.

Its key environment and landscape objectives are to both:

- manage the Shire's diverse environmental values in a sustainable manner by balancing the present and future needs with natural values and processes; and
- preserve and enhance scenic landscapes and cultural heritage values through the responsible management of land use and development.

More specifically, the Shire places much importance on the environment and landscape, the economy through tourism, agriculture and rural residential development, and on controlled housing and settlement patterns. These are discussed below.

What are the Shire's environmental objectives?

The Shire's environmental strategy covering vegetation and biodiversity is both:

- to reverse the decline in native vegetation and loss of biodiversity; and
- to achieve a net increase in native vegetation cover within the Shire.

Its related objectives for streams and wetlands are to:

- protect streams and wetlands from pollutants, nutrients, sediments and salinity;
- restore degraded waterways and wetlands; and
- improve water quality.

Other Shire environmental objectives consistent with the objectives of this Catchment Plan relate to pest plant and animal control and to resource conservation covering water use and waste management.

Achievement of its vegetation and biodiversity objectives are based around the use, protection, conservation and management of native vegetation and associated values within the Shire.

Achievement of the streams and wetlands objectives are based on the need for:

- an integrated approach to land and water management;
- ongoing assessment of the condition of streams and wetlands;
- ensuring that appropriate land use and management occurs to protect water quality;
- encouraging the protection and re-instatement of the riparian zone on all streams; and
- application of farm planning principles as part of the assessment of development and subdivision applications in rural areas.

All of the above strategic and achievement objectives are fundamental drivers for the development and implementation of this Catchment Plan.

What are the catchment's planning issues?

Pressures threatening the achievement of the Shire's objectives outlined above include:

- a general shortage of land for development, which increases property values and creates pressure to increase densities;
- increasing development pressures in Torquay and Jan Juc, both of which have limited capacity to expand;
- pressures to subdivide environmentally sensitive land along the coast and its hinterland;
- land subdivision pressures for hobby farms and rural living;
- farmers seeking to capitalise on their property to diversify interests or fund their retirement, potentially resulting in permanent loss of rural land, reduced holding size, reduced capital investment into farm maintenance and land management, and increases in land values;
- low farm profitability, limiting farmers' abilities to manage and care for their land;
- increasing demand for more and bigger houses on smaller allotments, which can compromise township tree canopies and the Surf Coast's distinctive coastal vegetation;
- pressures to construct large or obtrusive buildings to access coastal views.

What is the Planning Scheme for?

Municipalities must base land use planning decisions on their planning schemes, including the State and local policy components. They must also:

- consider any regional catchment strategies and natural resource management action plans, and requirements of relevant legislation; and
- refer land use and development applications to designated referral authorities, including relevant government agencies and water and catchment authorities, for comment and conditions, as input into decisions on those applications.

To deal with the above and other issues, the Shire needs to use its planning scheme to:

- Designate and protect sustainable agriculture areas, to discourage rural subdivision for hobby farms in areas of good to high agricultural value, and to maintain green belts or buffer zones between towns.
- Protect significant remnant vegetation including indigenous vegetation on roadsides, and in areas that visually impact on the Great Ocean Road.
- Designate growth areas within the Shire and ensure that future growth occurs as far as possible within the existing boundaries in designated towns.
- Retain and enhance the unique character and features of each town, and to encourage medium-density residential development where appropriate, while also preserving residential amenity.
- Prevent ribbon development in coastal areas.
- Designate tourism precincts within towns, focusing on visitor activity.

Most of these issues directly relate to the natural assets of the Spring Creek catchment as defined for this Catchment Plan.

Relevant legislation is identified in Appendix 3.

Land Use zones and overlays

Three main land use zones are applied within the Spring Creek catchment:

- *Residential*: This zone defines areas for conditional urban density residential use.
- *Rural Use Zone (RUZ)*: This zone retains land for rural uses including agriculture and low density residential development, subject to minimum allotment sizes and other conditions.
- *Environmental Rural Zone (ERZ)*: This zone retains land specifically for environmental purposes and typically includes those large public land areas of the catchment retained in their natural condition.

Figure 5 on page 32, identifies the locations of the zones.

Shire Overlays applied within the Spring Creek catchment area include the Environmental Significance Overlay (ESO) and the Vegetation Protection Overlay (VPO).

The ESO designates areas where the development of land may be affected by environmental constraints, and aims to ensure that development is compatible with identified environmental values.

Consistent with Victorian Planning Provisions, the Shire's VPO is intended to achieve a range of objectives to protect and encourage enhancement of existing 'significant' vegetation, potentially in vegetation corridors, while also permitting ongoing legitimate use of private land for which it is zoned (e.g. farming in the Rural Use Zone).

Permits are required to remove vegetation in VPO areas, and Council is required to consider specified guidelines in making permit application decisions.

Residential zone

This zone covers the main township areas including currently undeveloped areas designated for urban expansion. Within the Spring Creek Catchment, the Shire's policy is to focus all new residential development on Torquay/Jan Juc.

Torquay/Jan Juc has the fastest growth within the Shire. Most coastal population growth will occur within designated growth corridors to the immediate north and west of Torquay/Jan Juc. This is to prevent urban sprawl into agriculturally productive or environmentally sensitive areas, and to provide for the orderly and efficient provision of infrastructure services (i.e. roads, water, sewerage, drainage and waste collection).

Residential development opportunities in Jan Juc will be gradually depleted as available development areas are filled. Current residential boundary roads for Torquay expansion include South Beach Road and Horseshoe Bend Road (northern and north-eastern) and Duffields Road (western). Long-term expansion may be required into other areas to the west of the Surf Coast Highway, which are designated within the planning scheme. These areas currently include:

- the Torquay North area east of Surf Coast Highway up to the eastern ridgeline;
- land west of Ghazeepore Road and south of the northern ridgeline between Anglesea Road and South Beach Road;
- land bounded by Coombes Road, Surf Coast Highway and the northern ridge line; and
- land west of Strathmore Drive along Great Ocean Road to Bells Boulevard.

The Shire's environmental strategy for Torquay/ Jan Juc is as follows:

- to protect and enhance significant environmental features which contribute to the character and residential amenity of the town; and
- to encourage environmentally sustainable development that makes best use of limited land available for future development.

Policy proposals to enhance natural assets linked to this Catchment Plan at Torquay/Jan Juc include:

- extending the character of Yellow Bluff at least to Deep Creek and the sand dunes commencing at Whites Beach through strategic roadside and other minor plantings to convert an excessively open and windswept area into a green and shady coastal environment;
- creating extensive planting in the area from Torquay through to Torquay North; and
- protecting the qualities of the Spring Creek valley through enhancement of the valley drainage system as a key part of the future open space system, and by identifying suitable areas for long-term recreational use.

The **Bellbrae** township is on the south side of the Spring Creek valley, four kilometres west of Torquay, and is traversed by the Geelong -Anglesea Road. While it originated as a small service centre, it now provides a peaceful and picturesque semi-rural lifestyle to residents close to Torquay/Jan Juc and Geelong.

The township has not expanded significantly over many years, and in the mid 1990s had a population of around 100. The main reason for this is the absence of reticulated water and sewerage, and the cost of their provision. However, the supply of vacant lots within the township has declined steadily.

The Shire's objective for Bellbrae and other hamlets is *'to maintain the viability and amenity while ensuring that new development does not adversely impact on the environment, particularly with respect to vegetation removal, catchment management, and waste water disposal.'*

To achieve this, the Shire Planning Scheme has raised a minimum allotment size within the township from the original 0.2 ha to 0.4 ha. This provides for low density character, allows for the absence of reticulated sewerage and prevents the re-subdivision of most allotments. Larger lots of around 3.5 ha are normal to the east and south of the township.

Other planning scheme measures to protect the amenity of Bellbrae and its surrounding hinterland include:

- protecting existing rural vistas and ridgelines from further development, particularly where visible from the Great Ocean or Anglesea Roads;
- ensuring that the design, siting and colour of new development does not detract from the views from Great Ocean and Anglesea Roads; and

- ensuring that any road improvement or highway development plan considers maintaining the bushland character of the township and rural hinterland.

The Shire also requires that all land subdivision applications include a detailed site assessment by qualified persons. This must address all issues relating to wastewater disposal and management in accordance with the 'State Environment Protection Policy-Waters of Victoria' and the 'Code of Practice - Septic Tanks' (EPA Publication 451).

Rural zones

The **Rural Use Zone (RUZ)** and **Environmental Rural Zone (ERZ)** cover the majority of the Spring Creek Catchment Plan area.

The RUZ covers most of the freehold areas. Intended uses include extensive animal husbandry (e.g. dairying, grazing), and cropping (including horticulture and timber production).

The RUZ is also intended to encourage protection and enhancement of natural values, and to ensure that subdivision promotes effective land management practices and infrastructure provision.

Key measures to protect the integrity of the land in the RUZ for current and future use include:

- a minimum subdivision size of 60 ha;
- limiting the number of houses built on a single lot or group of lots held in the same ownership, rather than on individual allotments; and
- encouraging retention of rural land holdings and their continued use for rural production.

Council decision guidelines for development proposals within the RUZ require consideration of environmental issues, including:

- impact on natural physical features and resources including soil, water quality, and noise, dust or odour emissions;
- impact on flora, fauna and landscape features of the locality;
- protection and enhancement of the area's natural environment and character, including retention of vegetation and fauna habitat, and the need to revegetate land, including riparian buffers along waterways, gullies, ridgelines, property boundaries, and groundwater discharge and recharge areas; and
- impact on local character and appearance, and architectural, historic, or scientific importance.

Potential applicants for development, changed land use, or sub-division of RUZ land as for other zones, need to acquaint themselves with the zone provisions.

The **Environmental Rural Zone** includes areas incorporating Bellbrae, Bells Beach and Point Addis. Its purpose is to protect and enhance flora, fauna habitat and scenic landscape values by limiting development and vegetation removal, and to promote the need for regeneration and revegetation of corridors between remnant vegetation on private and public land, and the coastal reserve.

Stated purposes for the zone include:

- to protect and enhance the viability of natural ecosystems and important historic and visual environments;
- to encourage development and land use compatible with sound management and land capability practices, and which accounts for local environmental sensitivity and bio-diversity; and

- to ensure that subdivision promotes effective land management practices and infrastructure provision.

These measures are all compatible with the purposes of this Catchment Plan.

The zone applies a 60 ha minimum allotment size, and prohibits or applies permit conditions for land uses that could damage or diminish environmental assets. Permits are required for dwellings, buildings and associated earthworks and for associated infrastructure.

In considering ERZ applications, Council must refer to all State and local policies and guidelines, and consider the likely environmental impacts of the proposal on flora and fauna, revegetation needs in stream frontages, gullies, ridgelines, property boundaries, discharge areas and recharge areas. The impact of the proposed design and construction materials is also to be considered.

The following criteria covering earthworks, including dam construction, are important within this land use zone:

Subdivision	Land	Area/ Dimension
Minimum subdivision area (hectares)	All land	60 ha
Permit requirement for earthworks		
Earthworks that change the rate of flow or the discharge point of water across a property boundary	All land	
Earthworks which increase the discharge of saline groundwater	All land	
Capacity above which a permit is required to construct a dam		
Construction on any land of any dam with capacity greater than 3000 m ³		

Source: Surf Coast Planning Scheme

Rural residential development provides for a popular lifestyle alternative that is in constant demand, and which can have either a net positive or negative impact on a catchment's natural assets. It is often characterised by lack of reticulated sewerage, unsealed roads, capacity to accommodate animals and, small-scale economic activities.

Rural residential use occupies large quantities of land, and can detract from local economic efficiencies and opportunities for conventional urban growth. It also generally, but not necessarily, removes agricultural land from production, and increases land prices in rural areas.

Substantial portions of the Spring Creek catchment's rural zones land have been subdivided for rural residential use. To fulfil the objectives of this Catchment Plan, it is important to ensure that both the rural residential and remaining agricultural lands are managed productively so that potential for future uses into the long term is not diminished unnecessarily, and to protect and enhance remaining natural assets of land, water, habitat and air quality.

6.2 Other Shire initiatives

The Surf Coast Shire's *Environment and Conservation Plan* (ECP) identifies the Shire's main environmental values and priority actions. The ECP was developed in consultation with the Shire community, and a range of its identified actions relevant and specific to the Spring Creek Catchment are incorporated into the priority actions of this plan.

The Shire's 1997 document titled *Remnant Roadside Vegetation of the Surf Coast Shire* is also an important resource document that underpins the ECP. It contains comprehensive descriptions, lists, and conservation status 'scores' of the Shire's roadsides.

6.3 **Catchment Plan links to other regional and local initiatives**

The Spring Creek Catchment Plan is also consistent with the objectives and requirements of a range of other State, regional and local policies, strategies and plans relating to the protection and enhancement of natural assets. These are identified in Appendix 3. These collectively provide the framework for the Catchment Plan.

The plan is also consistent with the objectives of the larger and primarily rural-based Catchment Plan for Thompson's Creek, which is adjacent to and north of the Spring Creek catchment.

The Appendix should be regarded as a guide only, as new materials will emerge to supersede and add to the current content. It is also possible that other documents exist at the time of the production of Appendix 3 that have been overlooked.

6.4 **Community action**

Community action based on the commitment of local residents provides the cornerstone of catchment management. In addition to generating local works, it creates a focus for local and State government. It works most effectively when strong partnerships are developed between communities and the various levels of government and regional organisations.

At the time of preparing this plan, the Spring Creek catchment contains a number of active community groups that have collectively attracted funding into the catchment for important works. The groups include:

- ANGAIR
- Bellbrae Primary School
- Friends of Bellbrae Park
- Friends of Deep Creek
- Friends of Spring Creek
- Jan Juc Coast Action
- Torquay Coast Action
- Torquay Landcare
- Torquay Primary School

Major recent projects undertaken by the groups include:

- regular working bees, for weed removal, planting etc.;
- flora and fauna surveys;
- pest plant and animal control;
- protection of remnant vegetation and threatened species habitat on private and public land; and
- fencing of streamsides.

All groups require the active participation of community members to maintain impetus. Any person interested in involvement is encouraged to obtain the relevant contacts for existing action groups via the Surf Coast Shire. Likewise, any one interested in establishing community action groups is encouraged to contact the Shire, the Corangamite Catchment Management Authority or DNRE for information.

7 How do we get there?

The challenge facing the Spring Creek catchment community is to enhance those attributes important to the environmental, economic and social improvement of the catchment. This needs to be done through the development of priorities and a plan of action.

7.1 Priorities

The Spring Creek Catchment Committee has identified the following main focuses and broad objectives for considering and developing priorities and actions. A wide range of planning and project initiatives will be needed to achieve the objectives.

Nature conservation

To enhance the extent and quality of native vegetation and habitat for flora and fauna conservation, in balance with other natural asset values.

Water quality and waterway health

To maintain water quality in streams to protect and enhance biodiversity and community health needs, and to ensure that the long-term future use potentials of the water are not diminished.

To maintain and enhance the physical condition of streams and stream reserves.

Land productivity

To ensure that the inherent capacity of all land within the catchment for any use is not diminished over time.

Catchment amenity

To maintain and improve the Spring Creek Catchment Plan area as a pleasant place to live.

Identification of the categories and the underlying priorities has occurred through a process of:

- considering the broad categories of land use and management in the Catchment Plan area and the catchment management issues that are associated with them;
- review of various regional and local (e.g. Shire) plans, strategies, policy documents, and actions contained within them;
- considering responses from two public meetings and written comments on the plan from the public consultation stages; and
- applying the Spring Creek Catchment Committee's collective knowledge of the plan area.

To achieve the above objectives, the Spring Creek, Jan Juc and Deep Creek catchment communities need to be committed and actively involved in ensuring that the catchment retains and improves all of those values which make it such a desirable place to live in.

Across all of the above focuses, specific attention is also required to manage and control:

- pest plants;
- pest animals; and
- fire; on public and private land.

Each of these present significant threats to the catchment. Native and non-native pest plants and animals are ongoing threats. Fire has caused major episodic impacts in recent decades, particularly in 1967 and 1983, and while it can have positive impact on native vegetation, it can also have potentially adverse impacts on fauna, people, private property, other infrastructure (e.g. fences, houses and sheds) and equipment assets. It is an ever-present threat that is likely to recur in the future. Also, the potential for both pest plants and animals infestation, and for fire, are likely to be subject to a range of influences as land use and

landscapes continue to change across the catchment. These issues always need to be considered in private and public planning decisions, and in day-to-day land and water management.

The following sections of the Catchment Plan address the priorities for attention within the framework of the four focus areas identified above.

7.2 The Spring Creek Catchment Committee

Implementation and promotion of the Spring Creek Catchment Plan will be overseen by an ongoing Spring Creek Catchment Implementation Committee. The Committee will be established following the formal release of the Catchment Plan.

Key functions of the Committee will be to pursue and implement the objectives and priorities of the Spring Creek Catchment Plan via the following means:

- Identify opportunities for project initiatives, in collaboration with the broader community including schools, organisations, and 'Action' and 'Friends' groups.
- Identify and pursue private and public sector funding and resourcing options including sponsorship or levies to support initiatives compatible with the plan
- Work cooperatively with the Thompson's Creek Catchment Committee to identify and pursue collaborative opportunities for funding, promotion, resourcing and works relevant to the two catchment plans.
- Monitor the interface between the Spring Creek Catchment Plan and the Surf Coast Shire Planning Scheme, including the use of the Catchment Plan as a reference document for the planning scheme.
- Work with the Shire and key organisations as needed to develop guidelines and information initiatives relevant to the objectives of the Spring Creek Catchment Plan .
- Regularly set and review action targets (e.g. two yearly), and conduct a full review of the Spring Creek Catchment Plan (e.g. after five years) in collaboration with the community and key agencies.

Focus and actions

The actions and priorities identified in this Part provide a guide to actions that are needed to contribute to achieving the objectives of this Catchment Plan. While the tabulations have been developed in consultation with the respective agencies, the actions include both commitments that are occurring and actions that are either being considered or that need to be considered in developing future organisational work programs. The actions are not all presented as work program commitments of the respective agencies and need to be considered as a guide for periodic reviewed and upgrading.

It is proposed that review and upgrading of the actions should occur after two years following the launch of this Catchment Plan. This should be convened by a Catchment Plan Implementation Committee in consultation with the community and respective agencies.

A full review of the plan should be conducted after five years.

FOCUS 1: Nature conservation

Objective

The nature conservation objective for the Spring Creek Catchment Plan area is:

To enhance the extent and quality of native vegetation and habitat for flora and fauna conservation, in balance with other natural asset values.

Vision

The vision is that ecological communities should be self-sustaining, with the ability for the genetic content of fauna and flora to move between habitat areas, thus ensuring a healthy and diverse gene pool.

Within the mixed-use catchment, we also need to balance nature conservation needs with those of land productivity, water quality and the condition of waterways. We also need to protect and enhance more general catchment amenity including landscape, noise and heritage values.

The links between the above issues are important. For example, rural landscapes with poor nature conservation values often suffer from degrading processes including soil erosion, rising watertables, and water quality decline, causing soil loss, sedimentation of water bodies, and nutrient and salt movement.

Conversely, high levels of conversion of production land to other uses including rural residential and nature conservation, inevitably results in an overall loss of catchment production.

Needs

Spring Creek catchment landowners therefore need to recognise the following issues to achieve the catchment's nature conservation objective:

- All native vegetation including non-threatened and depleted vegetation communities has habitat and conservation values that can usually be enhanced through careful management.
 - Special attention is needed to protect and enhance populations of rare or endangered species, and habitats with potential to provide for such species.
 - Large natural areas of vegetation and habitat corridors that join habitat areas are very important for nature conservation.
 - The conservation value of remnant vegetation needs to be considered in a whole catchment context rather than as independent units.
 - Common sense 'give and take' is needed to balance nature conservation needs with the catchment's other natural values discussed in this plan.
-

Opportunities and threats

Opportunities

Great opportunities exist to retain and further improve the catchment's remaining biodiversity values, together with its other natural assets.

The catchment retains large areas of public and privately owned native vegetation, particularly within its upper (western) and southern portions. Further into the middle and lower portions

of the catchment it also retains important remnant native vegetation and important linear reserves along roadsides and streamlines.

The Surf Coast Shire's *Environment and Conservation Plan*, its *Roadside Conservation Strategy*, and Draft Action Plans and Fire Management Plans for the catchment's main nature reserves (refer to Part 1 for details) identify management measures for these important catchment assets.

Many smaller-lot landowners have also revegetated land to create current and future habitat values. Where carefully planned, this will greatly enhance the catchment's biodiversity values.

The nature values of these areas can often be further improved by seeking professional advice and by creating or improving habitat links or corridors. Careful management of linear reserves, retaining remnant and emerging regeneration, and planting of native over-storey and under-storey vegetation species, preferably indigenous to the area, are important management strategies. Developing or improving strategic habitat corridors along stream reserves or roadsides can provide an important focus for community action.

The Spring Creek Catchment community itself provides another great enhancement opportunity. It has a range of organisations and leaders committed to improving the catchment's biodiversity values, and with the ability and determination to achieve results. This is the strongest local asset for generating ongoing project action and community education and awareness.

The above factors combine to provide the Spring Creek community with opportunities that do not exist in many other catchments.

Threats

The catchment also faces threats that could greatly diminish its nature conservation values. These include population-related pressures associated with urban development, low-density rural development and, potentially, recreation. Future agricultural development could also impact on nature values.

Current or potentially relevant threats in the Spring Creek catchment include:

- Lack of landowner knowledge of existing or potential nature values and management needs associated with their land.
- Habitat loss or severance of habitat links caused by future residential or agricultural development.
- Damage or disturbance to habitat through human use of, and livestock access into, remnant vegetation areas. (e.g. public reserves, stream frontages, road reserves).
- Impact of pest animals, including feral or wandering domesticated species, especially cats and dogs on private and public land.
- Insensitive weed and pest animal management in road and stream reserves, and in private and public remnant habitat areas.
- Impact of pest plants including 'garden escape' environmental weeds.
- Impact of bushfire and unnecessary, or unplanned burning on areas with nature conservation values.
- Potential impact of soil and plant pathogens such as the fungus *Phytophthora cinnamomi* (i.e. Cinnamon Fungus).
- Impact of domestic, industrial, and agricultural chemicals and fertilisers, and loss of soil and associated nutrients on land-based ecosystems.
- Insensitive installation and maintenance of services including roads, power lines, water and sewerage infrastructure.

Action

Two main action levels are important to protect and enhance nature conservation values in the Spring Creek catchment:

- general day-to-day land use actions by all land managers that can impact positively or negatively on nature values; and
- priority projects to enhance nature values at specific sites.

Priority actions

The priority actions for helping to protect and enhance the Spring Creek Catchment's biodiversity values are presented in Table F1.1.

All of the actions are consistent with the objectives of the *Corangamite Regional Catchment Strategy*, the *Victoria's Biodiversity* documents, the State and regional (draft) Native Vegetation Plans and the Surf Coast Shire's Planning Scheme and its *Conservation and Environment Plan*.

The actions will form the basis for future funding and applications to government and the Shire. However, the actions cannot happen without the commitment of people in the catchment with the interest and enthusiasm to make them occur.

What can I do to help?

All land managers can contribute to the nature conservation objectives for the Catchment Plan area by observing some standard management needs.

It is also important to consider the compatibility of actions for nature conservation with those for other catchment objectives, and with the management of neighbouring lands. Further professional advice should be sought for detail on specific land areas.

A summary of general day-to-day management actions is provided in Table F1.2.

Table F1.1: Priority actions for nature conservation

* For actions delegated to the Surf Coast Shire, status is defined as **R** (requires funding/council commitment), **D** (discussions have occurred, but no commitment), **C** (part of a staff member's current work program), **O** (ongoing), **COMP** (completed), **TBD** (to be determined).

Action	Priority	Responsibility	Status*	Comment
Revegetation and protection of remnant native vegetation				
<ul style="list-style-type: none"> Protect remnant vegetation and revegetate damaged areas. 	High	All landholders	Ongoing	This is a fundamental basis to the Catchment Plan.
<ul style="list-style-type: none"> Develop a council policy to jointly encourage conservation and production forestry outcomes compatible with the objectives of the Spring Creek Catchment Plan . 	High	Shire	D	Possible future timber plantation policy to be developed.
<ul style="list-style-type: none"> Promote private landholder participation in the Shire's Biodiversity Incentives Program, including promoting Land For Wildlife and Trust for Nature covenants. 	High	Shire (promotion); landholder (participation)	C	Part of current and 2002/03 Biodiversity Conservation Incentives Program.
<ul style="list-style-type: none"> Establish an indigenous seed bank and 'market' for public and private revegetation projects in the catchment. 	High	Not specified	Not defined	Part of many recent regional and local discussions between many stakeholders.
<ul style="list-style-type: none"> Assess the conservation value of unused road reserves. <ul style="list-style-type: none"> Liaise with the current lessees to protect any recognised areas of high conservation value and strategic corridor links. 	Medium	DNRE	Ongoing	Occurs on case by case basis as need and resourcing permits
<ul style="list-style-type: none"> Ensure that licences on public land, roads, rivers, lakes and other reserves require that biodiversity values are not threatened. 	High	DNRE/Shire	Ongoing	Shire has many reserves with high biodiversity value where licensing is required.
<ul style="list-style-type: none"> Participate in roadside management in accordance with the Shire Roadside Management Strategy. 	Medium	Private land owners	Ongoing	Roadside Management Strategy to be developed 2002/03.
<ul style="list-style-type: none"> Continue to develop planned community-based native vegetation protection, enhancement and revegetation programs based on indigenous plants, including native grasses, in suitable private and public lands and reserves including stream frontages. 	Medium	Landowners, and community via community groups, Shire, DNRE etc.	Ongoing	Potential exists for community-lead promotion of this action
<ul style="list-style-type: none"> Develop Shire planning guidelines incorporating Shire decision-making processes on State Native Vegetation Retention procedures, including the 'no net loss' or 'net gain' principles, for application to public and private development projects. 	High	Shire with DNRE	R	'Net Gain' principle formally adopted by State Government in August 2002 (refer Plan text).
<ul style="list-style-type: none"> Develop a Shire planning policy to provide for significant native vegetation areas in future subdivisions in the catchment to be reserved as Council-owned or other form of conservation reserve. 	High	Shire	R	Policy gaps will be identified by the review of the Shire Planning Scheme's Municipal Strategic Statement (MSS) in October 2003.
Control pest plants and animals, and diseases of native vegetation				
<ul style="list-style-type: none"> Implement <i>Surf Coast Shire Pest Plant and Animal Action Plan</i>. 	High	Mangers of private and public lands	D	Contact Shire pest plants and animals officer for information.
<ul style="list-style-type: none"> Develop a control program to prevent Indian Mynah infestation spreading into the catchment and to Anglesea. 	Medium	All land managers	O	Priority activity via Shire Flora and Fauna Action Group (Refer to Shire Pest Plants and Animals Officer).

Action	Priority	Responsibility	Status*	Comment
<ul style="list-style-type: none"> Develop a control program for <i>Phytophthora cinnamomi</i> (i.e. Cinnamon fungus). 	Medium	DNRE	Ongoing	
Native fauna				
<ul style="list-style-type: none"> Develop and implement a prioritised program of research and monitoring of native fauna to fill information gaps, and determine management strategies to achieve net gain of species consistent with the wide range of uses of the catchment area. 	Medium	DNRE (development), Shire community, Shire etc. (Implementation)	R	Native fauna monitoring normally linked to particular programs or needs.
Development of revegetation systems				
<ul style="list-style-type: none"> Conserve and regenerate Grasslands and Grassy Woodlands vegetation systems where opportunity is identified. 	Medium	Community groups, landholders	Ongoing	
Public Land Management				
<ul style="list-style-type: none"> Complete and implement draft Action Plans for the following Shire owned or managed nature reserves: Grass Tree Park, Iron Bark Basin and Menzels Nature Reserve. 	High	Shire via Flora and Fauna Action Group	C	Most plans are currently in draft form.
<ul style="list-style-type: none"> Develop an Action Plan for Jan Juc Creek. 	High	CCMA/Shire/ DNRE/ community	D	High priority community involvement task.
<ul style="list-style-type: none"> Prepare and implement Shire Roadside Management Strategy to accommodate the Shire's and the Catchment Plan area's nature conservation values. 	High	Shire	C	Shire is a member of the Regional Roadside Management Committee.
<ul style="list-style-type: none"> Prepare three booklets detailing roadside construction and maintenance guidelines for contractor and staff use: <ul style="list-style-type: none"> <i>Environmental Maintenance Guidelines for Roadsides and</i> <i>Environmental Construction Guidelines for Roadsides'</i> <i>Guidelines for Roadside Plantings in Rural Areas</i> 	High	Shire	D	Discussions proceeding.
Access to and recreation in public areas				
<ul style="list-style-type: none"> Prepare a Code of Practice for trail bikes, 4WDs and horse riding. 	Medium	DNRE, Sport and Recreation, Shire	TBD	No current action at this stage.
<ul style="list-style-type: none"> Identify and promote suitable sites for trail bikes, 4WDs, and horse riding within the catchment. 	Medium	Shire, DNRE	R	Concept requires further development.
Research and Mapping				
<ul style="list-style-type: none"> Initiate a working group to prepare a catchment <i>Green Corridors Plan</i> to include: <ul style="list-style-type: none"> habitat corridors for wildlife movement linking reserves and private bush remnants; Land for Wildlife and conservation covenant properties linear remnants; remnant vegetation mapped on private and public land; sites for natural regeneration, restoration and revegetation to connect corridors; sections of linear reserves that may be appropriate for classification as nature reserves and walking trails. Review the appropriateness of the applied Vegetation Protection Overlay in the Surf 	Medium	Shire	R	A major resourcing and strategic task with important long term implications for the catchment. Requires strong community involvement convened by Shire or a delegated body. Potential initiation task for ongoing Spring Creek Catchment Implementation Committee.
<ul style="list-style-type: none"> Review the appropriateness of the applied Vegetation Protection Overlay in the Surf 	High	Shire	D	Important task of refining current planning

Action	Priority	Responsibility	Status*	Comment
Coast Shire Planning Scheme, and revise boundaries where inappropriately applied.				scheme application to rectify any anomalies in initial Overlay designations.
<ul style="list-style-type: none"> Investigate amending the Shire planning scheme to introduce a special Conservation or Vegetation Management Overlay for land adjacent to Flora and/or Fauna Reserves that is supporting native vegetation. 	Medium	Shire	R	Planning Scheme refinement task. Could also do the same for Environmental Significance Overlay (ESO).
<ul style="list-style-type: none"> Update maps of biologically significant remnant indigenous sites at a useful scale for local use. 	Medium	DNRE	C	Scheduled for 2003, then recurrent each 5 years.
Community Education				
<ul style="list-style-type: none"> Establish new, or participate in existing working groups, to address priority nature conservation issues including: <ul style="list-style-type: none"> managing weeds (Serrated Tussock, Gorse, Ragwort etc.); protecting significant areas and/including roadsides; providing wildlife habitat including protecting remnant vegetation; and encouraging natural regeneration and revegetation of eroding gullies and waterways; identifying threatened flora and fauna. Prepare a guidelines booklet or booklets to encourage natural regeneration and revegetation with indigenous plants in coastal and rural areas of the Shire to include: <ul style="list-style-type: none"> best practice techniques for vegetation enhancement, protection and management; lists and pictures of appropriate plants; seed collection and propagation information; permit requirements; local contacts including Landcare, environment and land management groups, and plant nurseries; government programs and funding opportunities; references to relevant documents. 	Medium	Shire, community	O/C	Shire Environmental Advisory Committee (ENVAC) has a key role. Various community groups are participating in nature conservation.
<ul style="list-style-type: none"> Prepare a guidelines booklet or booklets to encourage natural regeneration and revegetation with indigenous plants in coastal and rural areas of the Shire to include: <ul style="list-style-type: none"> best practice techniques for vegetation enhancement, protection and management; lists and pictures of appropriate plants; seed collection and propagation information; permit requirements; local contacts including Landcare, environment and land management groups, and plant nurseries; government programs and funding opportunities; references to relevant documents. 	High	Shire	COMP/C	Shire Rural Living Booklet has been completed and is available from Shire. Vegetation Planting Guide is in draft form.
<ul style="list-style-type: none"> Complete, promote, and implement <i>How to Plan for Fire Safety and Biodiversity : A Guide for Private Landholders</i> 	High	DNRE	Not specified	Project associated with Land for Wildlife program.
<ul style="list-style-type: none"> Complete, implement and promote fire management plans for Bellbrae Reserve, Ironbark Basin, Deep Creek East, Grass Tree Park, and Menzels Road Reserve. 	High	Shire, DNRE	C	Progressive program through respective reserves.
<ul style="list-style-type: none"> Conduct roadside vegetation management training workshops, to include participation by roadside workers. 	High	Shire, DNRE	C	
<ul style="list-style-type: none"> Encourage tertiary institutions involvement in research and investigations to better understand the catchment biodiversity values. 	Medium	DNRE, Shire	C	
<ul style="list-style-type: none"> Promote nature conservation as an important component of Whole Farm (or Property) Planning (refer to Land Productivity Focus). 	High	CCMA, DNRE, Shire	C	Whole Farm Planning courses delivered by Shire/NRE. 'Rural Living' booklet is key reference

Action	Priority	Responsibility	Status*	Comment
<ul style="list-style-type: none"> Promote the biodiversity 'no net loss' / 'net gain' concepts to landholders across the catchment. 		DNRE, Shire	R	'No net loss' policy formally adopted by State Government in 2002, requires consideration of replacement of biodiversity loss with overall net gain in planning and development decisions .
<ul style="list-style-type: none"> Encourage residents to nominate suitable trees for the Shire's <i>Register of Significant Trees</i>. 	Low	Shire	O	
<ul style="list-style-type: none"> Prepare a booklet or poster highlighting the native birds and animals of the Shire. 	Medium	Shire, DNRE	R	Not on current programming.
<ul style="list-style-type: none"> Stage field days and forums for the Shire Biodiversity Incentives Program and other current biodiversity issues. 	Medium	DNRE, Shire, community	C	Incentives Program has funding for 2002/03 financial year.

FOCUS 2: *Water quality and waterway health*

Objectives

To maintain water quality in streams to protect and enhance biodiversity and community health needs, and to ensure that the long-term future use potentials of the water are not diminished.

To maintain and enhance the physical condition of streams and stream reserves.

Vision

The vision is that the streams will flow with good quality water through a healthy catchment, along watercourses that are in a stable and clean condition.

To achieve the vision, water quality, as measured by trends in indicators including turbidity, nutrients (e.g. nitrogen and phosphorus), salinity, and in-stream life, should be maintained and preferably improved within accepted regional levels discussed within the *Corangamite Region Nutrient Management Plan* and the Corangamite Region's *Waterway Health Strategy*.

Achievement of the objective and vision will also require attention by all land managers to both point source and diffuse source management issues.

Opportunities and threats

Opportunities

Main opportunities for achieving acceptable water quality and healthy waterways include:

- retention of considerable areas of the upper catchment under forest, and free of intensive urban and industrial development;
- maintaining good management of vegetation cover and soils across the broader catchment and in the vicinity of streams;
- managing livestock to prevent disturbance of stream banks and floors; and
- managing the spread of urban and rural residential development to minimise impact on streams and stream water.

The substantial areas of native vegetation cover in the Spring Creek catchment are likely to be moderating watertable rises which are prevalent elsewhere across the State. The upper catchment in particular retains considerable forested land and is free of intensive urban or industrial development. Also, the relatively low incidence of cultivation is likely to be resulting in low levels of broadacre soil movement towards and into drainage lines. The shift to rural residential development of the landscape, and associated revegetation, may impact positively on this issue.

A motivated community within the Catchment Plan area is a major opportunity. Active Landcare and associated groups are important for this. The Shire through its planning scheme and environmental management programs provides an important coordination conduit.

These opportunities do not exist in many other places to the same extent as in the Spring Creek Catchment Plan area.

Threats

Threats to water quality and waterway health are likely to show as increased nutrients, salinity and turbidity, and potentially as chemical or petroleum-product contamination. However, as the streams in the Spring Creek catchment are not regularly monitored under the region's nutrient management plan, trends are not being formally assessed.

A range of specific point source or diffuse catchment processes and actions diminish water quality and waterway health values. These are most likely to include:

- direct stock access to streams and main drainage lines (for silt and nutrients);
- seepage from poor-performing domestic septic systems;
- increased run-off from expanding urban development, and associated rubbish pollutants;
- spillage of chemicals or other contaminants into or near streamlines;
- paddock cultivation; and
- vehicular stream crossings.

Nutrients

Nutrients (generally measured as phosphorus and nitrogen) enter waterways from point source or diffuse origins.

- *Point* sources are usually associated with urban and industrial development, and are generally traceable to the source, are easy to monitor, and contribute nutrients that would not occur naturally.
- *Diffuse* sources enter waterways along their length and are more difficult to monitor and manage. Examples include groundwater infusions and run-off from agricultural and forested land.

Land managers should identify the most likely pathways for nutrient movement from their properties, and choose the most effective solutions to either immediately or progressively reduce the potential for pollution.

Groundwater intrusion is likely to be more important during low stream flow periods and, where agriculture is the dominant land use, it tends to be the largest contributor of nutrients. Poorly located septic tank systems and stock access to streams are common contributors in low density rural residential areas.

In some cases, nutrients are stored in stream sediments, and physical disturbance can release them into stream flow.

The Spring Creek catchment is within Corangamite Region's Eastern Coastal Plains Nutrient Management Unit, which has 'medium priority' for control of total nitrogen or phosphorus in waterways. The Regional Nutrient Management Plan suggests that in 'medium priority' areas, public investment is warranted only where there are important social and environmental benefits to be gained.

Regardless of the above ranking, adoption of the Water Quality and Waterways component of the Spring Creek Catchment Plan is needed to maintain and enhance the water quality in the catchment for a range of public and environmental health and use reasons.

Salinity

Salinity is primarily a diffuse source issue, resulting from the intersection of naturally saline groundwaters with drainage lines. Salinity concentrations are more important than total loads.

Since European occupation, the clearance of deep-rooted perennial vegetation for agriculture and other uses has resulted in higher and faster surface flows, less plant water use and increased deep infiltration of water to below the plant root zone. Watertables have risen in many areas to intercept drainage lines and feed salt into streams. Soil salinity is also caused where watertables rise to within about 1.5 metres of the land surface. Changes in in-stream ecology, and to the

structure of vegetation communities, can occur as a result. In severe cases, this may result in complete vegetation loss and soil erosion.

While significant salinity problems are not currently apparent in the Spring Creek catchment, the creek is known to historically and periodically run saline water. Also, watertables are likely to be rising as elsewhere across Victoria, resulting from vegetation clearance. Salinities of the catchment's watercourses may therefore increase over time.

Sedimentation and turbidity

Sedimentation and turbidity occur from either physical disturbance to the bed and banks of water courses, or from off-site soil erosion due to catchment disturbance.

Erosion from residential development sites and from land cultivation is likely to be the major current source of sedimentation to the catchment's streams. Some sedimentation is also likely from unsealed roads and access tracks, and from roadsides.

There is currently little off-stream soil erosion in the middle to upper catchment likely to be contributing significant sedimentation into the surface drainage system. This is largely due to favourable environmental features including soil types of the main farmed areas, and climate and current management regimes. It may also be due in part to the poorer soil types of the Gherang Gherang and Anglesea Land Systems being largely retained under native vegetation. As the topography is moderately to steeply undulating across the Bellbrae and Anglesea Land Systems through the middle to upper middle parts of the catchment, soil erosion would be a threat under less sensitive land management.

Stock and heavy human access into drainage lines and streams, can remain an ongoing source of disturbance. Associated implications include physical disturbance to in-stream ecology, stream turbidity and sedimentation of stream pools, and low velocity stretches of streams.

Altered catchment hydrology has usually been a major cause of changed conditions of stream environs. The widespread loss of trees and understorey across catchments has increased the quantity and speed of surface run-off. This increases erosion potential in concentrated flow lines. Within the main streamlines of the Spring Creek catchment however, dense reed beds both slow the lower volume flows and bind loose sediment. They will also be stripping nutrient from the stream waters. Larger flows are unlikely to be slowed by the reeds, and sedimentation is likely if reed beds are stripped by large flows.

Increased urbanisation within catchments also increases the total hard surface area, and hence surface flows, and run-off velocity. Intensive urbanisation also results in increased potential for pollution of streams by litter, chemicals, petroleum products, heavy metals, nutrients and soil (e.g. from construction/development sites).

Action

Priority actions

The priority actions presented in Table F2.1 are proposed to enhance water quality and waterway health in the Spring Creek catchment. All of the actions are consistent with the objectives of the key State, regional and local strategies and plans, as listed in Appendix 3.

The actions will form the basis for future funding applications to government and the Shire from the Spring Creek community. They require the commitment of people within the catchment with the interest and enthusiasm to make them occur.

However, to protect and enhance the catchment's water quality and waterway health values, sound management practice is needed across the catchment by all land managers.

What can I do to help?

All land managers can contribute to the water quality and waterway health objectives for the Spring Creek Catchment Plan area by practicing good general land management as summarised below. General day-to-day management suggestions are listed in Table F2.2. Professional advice should be sought for detail on specific land areas.

Table F2.1: Priority actions for water quality and waterway health

* For actions delegated to the Surf Coast Shire, status is defined as **R** (requires funding/council commitment), **D** (discussions have occurred, but no commitment), **C** (part of a staff member's current work program), **O** (ongoing), **COMP** (completed), **TBD** (to be determined).

Action	Priority	Responsibility	Status*	Comment
Catchment wide				
<ul style="list-style-type: none"> • Review the Shire planning scheme's Municipal Strategic Strategy and local policies regarding waterways and wetlands to provide direction for Council decisions on the protection, management and enhancement of waterways and wetlands, to include: <ul style="list-style-type: none"> • principles for retention of buffers in public ownership as nature reserves/corridors; • principles for land acquisitions; • introduction of a conservation buffer and/or conservation overlays on streams and wetlands where appropriate; • principles for development and use of artificial wetlands; • legislation requirements; • requirement for hydrology reports for planning applications where impacts on streams or stream flows may potentially occur; • consideration of lands subject to flooding. • Develop and implement a Shire stormwater management plan based on best practice drainage management. 	High	Shire, CCMA	R	Action is self-explanatory to refine planning scheme and Council's basis for planning advice and decisions.
<ul style="list-style-type: none"> • Develop a Surf Coast Shire <i>Environmental Guidelines for Waterway and Wetland Management</i> booklet for use by contractors, Shire staff, and landowners to include: <ul style="list-style-type: none"> • Shire and other legislation, policies and permit requirements; • environmental procedures or codes of practice for works; • information on individual waterways and wetlands; • procedures required prior to the mechanical opening of waterways; • any special management requirements; • flora and fauna information; • threats to groundwater qualities and quantities; and • signage to inform the community on environmental requirements • Conduct an inventory of stream condition and aquatic flora and fauna, to include the identification of sites of significance, and points of current or potential impact from threatening processes (e.g. erosion, nutrient discharge, influx of exotic species, and significant flow reduction or impedance). • Develop and implement waterway stability and restoration strategies and action plans for Spring Creek, Jan Juc and Deep Creeks, based on the stream inventory. • Implement conservation site works on Spring, Jan Juc and Deep Creeks, potentially to include: 	High	Shire CCMA, Shire	C/R R	Urban Stormwater Strategy underway but does not address rural areas. Requires consideration in future organisational planning. Potential project for community group or tertiary student project, based on adaptation of existing literature.
<ul style="list-style-type: none"> • Conduct an inventory of stream condition and aquatic flora and fauna, to include the identification of sites of significance, and points of current or potential impact from threatening processes (e.g. erosion, nutrient discharge, influx of exotic species, and significant flow reduction or impedance). 	High	CCMA	C	Inventory of stream condition occurring at time of Catchment Plan publication.
<ul style="list-style-type: none"> • Develop and implement waterway stability and restoration strategies and action plans for Spring Creek, Jan Juc and Deep Creeks, based on the stream inventory. 	High	CCMA	TBD	Other higher regional priorities exist.
<ul style="list-style-type: none"> • Implement conservation site works on Spring, Jan Juc and Deep Creeks, potentially to include: 	Medium	Joint responsibilities across	C	Priorities dictated by available funding and resources

Action	Priority	Responsibility	Status*	Comment
<ul style="list-style-type: none"> fencing of frontages of main creek sections where needed; protecting remnant vegetation and encouraging natural regeneration and revegetation in fenced and other areas; constructed vehicle crossings; 'preferred' stock watering sites along main creek lines and/or via stock troughs to restrict stock access; retaining or creating wetlands; controlling pest plants and animals; and rehabilitating eroded gullies. 		landholders, and public land managers including Shire, DNRE, CCMA.		
<ul style="list-style-type: none"> Maintain the existing Spring Creek Waterwatch Program and expand this to include Jan Juc and Deep Creeks, to monitor for key parameters including salinity, phosphorus, nitrogen and turbidity. Interpret trend data annually for recognition of potential issues, and for input to reviews of the Regional Nutrient Management and Waterway Health Strategies. Publish actual and trend records in the <i>Echo</i> newspaper and at community notice boards at the Surf Coast Shire Office. Incorporate data into the ongoing refinement of the Regional Nutrient Management and Waterway Health Strategies. 	High	CCMA, Shire, Waterwatch	C	Provides valuable database for Spring Creek. Requires community or school etc. commitment for sampling other creeks.
<ul style="list-style-type: none"> Annually review the Waterwatch findings for identification of issues to the Shire and CCMA. 	Medium	Catchment Plan Committee, Waterwatch	O	Barwon Water Waterwatch Coordinator maintains database
<ul style="list-style-type: none"> Organise an annual Clean Up of Waterways day for the Spring, Jan Juc and Deep Creek. 	Medium	Torquay Landcare, Shire, CCMA	R	
<ul style="list-style-type: none"> Maintain maps of areas subject to flooding for incorporation into the Surf Coast Shire Planning Scheme. 	High	Shire, CCMA, DOI	COMP	Maps completed, planning scheme amendment underway.
<ul style="list-style-type: none"> Replace septic public toilets impacting on waterways with low impact alternative toilet systems when the opportunity arises, and require all septic tank systems with potential to impact on surface water and drainage systems, to be operated in accordance with the EPA <i>Code of Practice - Septic Tanks</i> (EPA 1996). 	Medium	Shire	As appropriate	
For areas not zoned for urban use				
<ul style="list-style-type: none"> Actively encourage land managers to prepare, implement and self-monitor property management plans intended in part for protecting and enhancing water quality and waterway health in the Spring Creek Catchment. Key plan elements should include: <ul style="list-style-type: none"> establishing and maintaining filter strips along streamlines; soil conservation actions; access roading and vehicle trafficking; establishing and maintaining, preferably off-stream or at least hard surfaced, stock watering points; and siting of dwellings, buildings and associated infrastructure (e.g. vehicle parking 	High	Shire, DNRE, CCMA	C	Part of Whole Farm Planning Course delivered by Shire/NRE.

Action	Priority	Responsibility	Status*	Comment
<p>and washing bays, stormwater facilities etc.) in locations to avoid impact on water quality and waterways.</p> <ul style="list-style-type: none"> Promote and where possible require the developers and managers of intensive production enterprises and high nutrient producing activities to comply with industry standards and management guidelines or codes of practice where such exist. Identify the current impact of dams and domestic storages (e.g. rainwater tanks) on stream flow and develop recommendations for stream health, and any action requirements for Council (e.g. planning provisions within the Catchment Plan area). 	Medium	EPA, DNRE, DOI, CCMA	Ongoing	Shire role is in planning decisions, based on referral to industry standards and Codes of Practice where applicable.
<ul style="list-style-type: none"> Identify the current impact of dams and domestic storages (e.g. rainwater tanks) on stream flow and develop recommendations for stream health, and any action requirements for Council (e.g. planning provisions within the Catchment Plan area). 	Medium	CCMA, SRW	TBD	Requires negotiation with CCMA, SRW
In Urban and residential/commercial development site areas				
<ul style="list-style-type: none"> Develop Shire planning guidelines for development proposals that include a checklist of issues aimed at protecting and enhancing water quality and waterway health, and which are compatible with the EPA documents <i>Urban Stormwater Best Practice Environmental Management Guidelines</i> (1999), <i>Construction Techniques for Sediment Pollution Control</i> (1991) and <i>Environmental Guidelines for Major Construction Sites</i> (1995). 	High	Shire	C	Currently being addressed through the Surf Coast Shire's Environmental Management Systems Project.
<ul style="list-style-type: none"> Require all development applications within the Catchment plan area that involve potential land disturbance to be accompanied by a Site Management Plan that complies with the proposed Shire development proposal guidelines, or in the interim with the above mentioned EPA guidelines. 	High	Shire	C	Currently being addressed through the Environmental Management Systems Project.

Table F2.2: What can I do on my land to improve water quality and waterway health?

<p>On farming and other broad area (e.g. rural residential, and public reserve) sites</p>
<p><i>To minimise the impact of land condition and management on surface water quality and waterway health:</i></p> <ul style="list-style-type: none"> • Minimise land disturbance and soil exposure, particularly near streams and drainage lines by using ‘best practice’ land management standards. • Program land disturbance and management activities to times when potential for adverse impact on streams and water quality is minimised. • Rehabilitate disturbed, eroded or denuded areas, including dam banks, earthen batters of house/shed staging, road verges and cut and fills batters. • Locate, design and construct farm/property access tracks and structures to minimise their impact on drainage lines, wetlands and creeks, and so that they do not impede flow. • Where cultivation is needed, cultivate across slope and avoid main drainage lines. • Design and construct dams to best practice standards and to comply with Southern Rural Water (for siting across drainage lines/water courses) and <i>Surf Coast</i> Shire (for dams >3000 m³ capacity) requirements, and State legislation. Measures should include locating water storages off-site from main drainage lines, and matching dam capacity to catchment size to minimise excess flows through spillway. • Reduce surface run-off, soil loss and excessive recharge of ground water (i.e. rising watertables) by maximising plant growth, using moderate stocking rates well-managed perennial pastures with woody vegetation retention, and plantings where appropriate. • Eliminate stock access to streams by providing off-stream stock troughs on reticulated supply lines. Where this is not achieved, control stock access into creeks, by fencing of creek frontages to provide ‘preferred’ access locations (e.g. paved access areas). • Locate and construct chemical and dangerous goods storage sites to comply with legislative and local requirements, so that accidental spillage cannot impact on surface or groundwaters. • Comply with chemical and dangerous goods handling legislation (e.g. for chemicals etc.) and manufacturers instructions. • Use and store treated wastewater in accordance with State <i>Guidelines for Wastewater Reuse</i> (EPA Publication 646) • Use appropriate fertilisers as recommended, to minimise potential for wash-off of nutrients. • Manage septic tanks, particularly those remaining near drainage lines, in accordance with sound practice as identified in existing guidelines to prevent adverse impacts of seepage. • Monitor streams, and drainage lines and adjacent areas on properties regularly, to identify and rectify any problem issues and sites. • Maintain all drainage lines free from unnecessary or unplanned obstruction. • Locate vehicle washing and storage areas, and potential high nutrient or contamination sources away from drainage lines. • Use dishwashers in non-sewered areas in accordance with manufacturers instructions.
<p>At other sites including farm and urban development and construction sites.</p>
<ul style="list-style-type: none"> • Minimise erosion and sediment, chemical and nutrient pollution (e.g. for houses, sheds etc.) by conforming to the EPA guidelines <i>Construction Techniques for Sediment Pollution Control</i>(May 1991). Key features include: <ul style="list-style-type: none"> • plan and prepare in advance of works to prevent direct drainage and soil discharge to drainage lines by installing diversion drains and pollutant and sediment traps within and around works areas; • locate soil stockpiles away from drains, waterways and significant vegetation; • use low gradient batters for earthworks where possible; • rehabilitate exposed areas as soon as possible following construction; • contain vehicle trafficking to designated areas; • locate mobile toilets away from drainage lines to prevent impacts from potential spillage.

FOCUS 3: Productive land management

Objective

To ensure that the inherent capacity of all land within the catchment for any use is not diminished over time.

Vision

The vision for the catchment is for a healthy mixed-use landscape, with the use of all land able to be varied over time to suit market and community needs without deterioration of its inherent capabilities.

Within the catchment, such productive uses might include, but not necessarily be restricted to:

- economically productive uses such as agriculture, horticulture and forestry in their various forms;
- low density rural residential use;
- intensive urban and commercial or industrial development in areas zoned for that purpose.

Land zoning under the Surf Coast Shire Planning Scheme is an important aid to achieving the vision. However, while the planning scheme limits and applies conditions for land use, it cannot control the quality of land management for any given use. This is best addressed by the commitment of land managers to good land use practice, and where appropriate assisted by the following:

- Codes of Practice and Best Management Guidelines;
 - relevant legislation and associated guidelines, regulations, prescriptions and orders; and
 - plans and strategies designed to influence the actions of public and private land managers (e.g. the Spring Creek Catchment Plan).
-

Opportunities and threats

Opportunities

The Spring Creek catchment area has major opportunities for sustaining the land's productive capacity. These include the following:

- Favourable environmental conditions for diverse land use including soil types, moderate temperature, relatively consistent rainfall and varied topography.
- Retention of large areas of less fertile public and private lands under native vegetation provides a further major opportunity. This also presents advantage and opportunity under both the nature conservation and water quality focus issues.
- The holding of land under limited intensity or low density rural residential use and the management skills of the catchment's broadacre farmers also provide great opportunity for the continued productive capacity of the catchment. Under both farmed and non-farmed use, potential remains for retention of soil cover, soil structure and soil fertility, which are key elements of sustainable land use.
- The introduction of treated wastewater if used under best practice conditions can also be a strong opportunity. This can provide for more intensive primary production through the addition of key input requirements (i.e. water and nutrient) without exposing the land to other deterioration risks including excessive cultivation, often associated with intensified land use.

Threats

The major threats to long-term productive capacity of the land in the Spring Creek Catchment Plan area are associated with the following processes:

- Soil loss due to unplanned or inappropriate land clearance, over-grazing, concentrated stock and vehicle trafficking (including motor bikes), excessive or inappropriate land cultivation, and poor land subdivision, land preparation or management for development projects.
- Loss of soil fertility and structure or soil damage due to inappropriate or accidental chemical and fertiliser applications, soil compaction from overstocking and poor pasture management, and inappropriate disposal or spillage of petroleum products.
- Soil salinity resulting from alteration to the water balance due to failure to replace cleared native vegetation with vegetation with similar water use capacities.
- Pest animal encroachment onto productive land from other areas including high or low density residential areas and onto or from public lands, particularly where burrowing into land or strong competition for feed with other animals occurs.
- Weed encroachment, particularly where this leads to competition with other useful productive plants.

Fire has always occurred across the landscape, and while short-term production losses may be catastrophic and some short-term soil loss may occur, fire does not normally impact on the land's long-term productive capacity.

Actions

Priority actions

Priority land productivity actions for the Spring Creek Catchment Plan area are presented in Table F3.1. The actions align with the objectives and principles contained within the key State, regional, and local government plans and strategies identified within Appendix 3.

It is intended that the identified actions would form the basis for any future relevant funding applications to government and/or the Surf Coast Shire.

The priority actions cannot happen of their own accord and require the underpinning of broad-based sound catchment management by the whole of the catchment community.

What can I do to help?

All land managers can contribute to maintaining or improving the productive capacity of the Spring Creek catchment by using some standard good practice management techniques summarised in Table F3.2. Professional advice should be sought for detail on specific land areas.

Table F3.1: Priority actions for productive land management

- For actions delegated to the Surf Coast Shire, status is defined as **R** (requires funding/council commitment), **D** (discussions have occurred, but no commitment), **C** (part of a staff member's current work program), **O** (ongoing), **COMP** (completed), **TBD** (to be determined).

Action	Priority	Responsibility	Status	Comment
Productive land priorities				
<ul style="list-style-type: none"> • Establish an ongoing Catchment Plan implementation/strategy group to identify and propose responses to issues with potential to impact on the condition of natural assets that support the productive capacity of, and associated enterprises, in the catchment. 	High	Spring Creek Catchment Committee	C	Requires support of Shire, DNRE and CCMA
Right to farm and/or manage the land for productive purposes				
<ul style="list-style-type: none"> • Develop 'Right to manage the land' principles for land zones in the Catchment Plan, covering economic, social and environmental considerations, and legal requirements, and including duty of care for the protection of natural assets, and consideration of landholders and other catchment users. 	High	Shire, DNRE	COMP	This action is addressed via the Shire's Rural Living Booklet
Shire planning				
<ul style="list-style-type: none"> • Review the effectiveness of the current Shire rating system and incentives program as means of promoting and retaining land under primary production, and develop alternative approaches, if needed, to achieve this objective. 	Medium	Shire	R	
<ul style="list-style-type: none"> • Review effectiveness of Surf Coast Shire's rural strategy. 	Medium	Shire	R	Would be part of MSS review 2003.
Farm planning and management				
<ul style="list-style-type: none"> • Prepare, implement and self-monitor property management plans that reflect the land productivity and other focus objectives of the Spring Creek Catchment Plan, and that are based on protecting and enhancing the condition of the land asset to support current or emerging future productive enterprises. 	Medium	Landowners with DNRE and/or Shire support	C	
<ul style="list-style-type: none"> • Develop and implement annual monitoring and management programs for current or potential non-native and native plant and animal pests, as an important component of property management planning. Where appropriate, this should occur in collaboration with responsible authorities (e.g. roadsides management in accordance with roadside management plans where such plans exist). 	High	Landowners with DNRE, CCMA, Shire promotion and coordination.	C	
<ul style="list-style-type: none"> • Design and implement appropriate training programs on property management planning. Land managers to attend such programs. 	Medium	Shire/DNRE/ TAFE system/ Landholders	C	Shire/NRE Whole Farm Planning.
Water management				
<ul style="list-style-type: none"> • Develop guidelines for water storage and management on non-urban properties within the Spring Creek Catchment Plan area based on the need to conserve adequate water to protect against prolonged dry periods or drought, and to protect the land from damage during such periods, and from inappropriate planning for and location 	Medium	DNRE/CCMA/ Southern Rural Water	TBD	Important for wise and strategic use of water and protection of stream flows and catchment productivity.

Action	Priority	Responsibility	Status	Comment
of watering points.				
Intensive production land uses (including, forestry, horticulture, viticulture, flowers, vegetables)				
<ul style="list-style-type: none"> Develop clear policies covering the siting and location of intensive production enterprises (e.g. market gardening, flower growing, vines and horticulture, plantation forestry etc.), and the use of treated wastewater on catchment lands, in accordance with the Surf Coast Planning Scheme and applicable environmental and best practice management guidelines. 	High	Shire	D	Existing industry Codes and Standards (eg <i>Environmental Guidelines for Victorian Flower Growing Industry</i>) and State regulatory guidelines (e.g. for Wastewater Reuse) provide base for regulation and resource management.
<ul style="list-style-type: none"> Develop land management guidelines for intensive land use within the Catchment Plan area, based on existing Codes of Practice, and environmental and best practice guidelines, (e.g. <i>Environmental Guidelines for Victorian Flower Growing Industry</i>). 	Medium	DNRE, CCMA	TBD	Shire Policy on Intensive Animal Industry is currently being developed and existing industry Codes (eg Broiler Industry Code of Practice, Piggeries Code of Practice) and State regulatory guidelines (e.g. for Wastewater Reuse) provide base for regulation and resource management.
<ul style="list-style-type: none"> Develop clear policies covering the siting and location of intensive animal production enterprises (e.g. poultry, pigs) in accordance with the Shire Planning Scheme and best practice guidelines and codes. 	High	Shire	C	Policy currently being developed in collaboration with three other Corangamite Region municipalities, for direct relevance to Spring Creek area.
Fire and fuel management to reduce threat to productive land				
<ul style="list-style-type: none"> Maintain the existing Shire/CFA/DNRE Working Group to identify and address issues of current or potential community concern regarding fire management on private farmland and adjoining public lands. Main issues to address include roadsides management, firebreak design and management, and burning off issues. 	High	Shire, CFA, DNRE	C	Through Municipal Fire Prevention Committee.
Community education and awareness				
<ul style="list-style-type: none"> Develop and conduct a focussed education program through field days, workshops etc., and other mechanisms to systematically improve community understanding of and action on all of the above issues, including the benefits of farm planning. 	High	Shire, DNRE, CCMA	C	
<ul style="list-style-type: none"> Prepare/promote and maintain relevant information guidelines covering the use and management of land within its capability to prevent and reduce land degradation. Key content to include: <ul style="list-style-type: none"> minimising soil loss; maintaining soil fertility and managing nutrient movement; minimising soil salinity; minimising soil acidity; avoiding chemical contamination of land and water; managing pest animals (including domesticated pet species); managing pest plants; constructing and managing farm dams. 		CCMA, Shire, DNRE	C/R	Some dot points are part of current program, some are subject to funding/commitment.

Table F3.2: What can I do on my land to improve land productivity?

In agricultural/farming areas.
<ul style="list-style-type: none"> • Develop and implement a property management plan, covering land use, farm/property improvement programming, and management schedules. • Manage land within its capability limits. • Maintain full ground cover to reduce wind and water erosion, moderate surface run-off and reduce accessions to groundwaters. • Minimise cultivated areas, and where it is needed, cultivate across slope. • Maintain healthy, vigorous pastures preferably based on recommended perennial species. • Align vehicular access tracks on minimum grades and dissipate water via regular cut-offs. • Confine stock and vehicle crossings of main drainage lines to defined stable crossing points. • Minimise pest plant and animal invasion through planned annual control programs, careful attention to vehicle movements and the stockpiling of firewood and other materials, and by limiting stream crossings to defined locations. • Minimise land contamination potential from chemical spill or use of inappropriate chemicals by careful siting of storage and preparation areas, handling as specified by manufacturers, and disposing as required by statutes and local requirements. • Ensure water supply is adequate to cover lengthy dry periods or drought, and prepare and implement adequate contingency plans to protect land and water resources (e.g. adjusted stocking rates) when water is limiting.
In low-density rural subdivision areas.
<ul style="list-style-type: none"> • Manage main issues generally as for agriculture above. • Use professional advice on management of livestock including stocking rates, paddock size, 'housing', feeding, and watering. • Site houses and other development infrastructure (e.g. access roads, power facilities etc.), to comply with good practice to minimise potential adverse impacts on soil, water and air. • Incorporate landscape design into permit and construction plans, rather than have it developed as an afterthought. • Avoid overstocking with domestic or recreation animals (e.g. horses, dogs, cats).
In other areas including residential areas.
<p>To prevent potential for adverse on-site and off site productivity impacts:</p> <ul style="list-style-type: none"> • Manage disturbed sites to contain sediment and other pollutants, and minimise potential for dust, soil erosion, weed invasion, and altered surface water flows to impact on agricultural and other land including residential by: <ul style="list-style-type: none"> developing works plans for disturbance sites (refer EPA document <i>Construction Techniques for Sediment Pollution Control</i> (EPA May1991) designing road and other cuttings, including batter slopes and their rehabilitation, to eliminate short and long term off site soil loss; choosing garden and domestic plants carefully to ensure that significant environmental and invasive weed species are not introduced; and Containing vehicle trafficking to defined areas. • Use chemicals, fertilisers and potentially harmful products in accordance with manufacturers' specifications.

FOCUS 4: Catchment amenity

Objective

To maintain and improve the Spring Creek Catchment Plan area as a pleasant place to live.

Introduction

Catchment amenity is defined within this Catchment plan as including:

- landscape quality;
- air quality;
- noise;
- heritage values (Pre-European presence).

This aligns with the Corangamite Regional Catchment Strategy's 'Catchment Amenity Program' which has the objective: 'To ensure a clean healthy and unique environment that supports individual lifestyle aspirations and community well-being'.

Heritage values are not formally a natural asset to be maintained under this plan. However, pre-European cultural heritage issues can often need to be considered in the planning and management of natural assets. Heritage is included in the Corangamite Regional Catchment Strategy's Catchment Amenity Program and is included in this Catchment Plan for consistency.

Landscape quality

Landscape quality is an important natural asset of the Spring Creek catchment. While its value can be subjective, it is widely acknowledged that the landscape variety across the Spring Creek Catchment Plan area is important to locals and tourists within and passing through the area. It is a major reason why many residents live in the area.

As discussed earlier in this document, the landscape of the Spring Creek catchment has changed continuously since European occupation. Fixed features include the varied undulating topography including the ridges and drainage lines, and potentially the blocks of uncleared public land. Variable features include the appearance of changing patterns of land use and elements of its management, including agricultural, housing and commercial development, fencing, roads to cater for changed land use, and the loss and replacement of vegetation on private and public land including road reserves.

The Surf Coast Shire Planning Scheme has a major impact on determining the future landscape character of the catchment through its limits on subdivision density and land use types according to land zones. However, the main impact on landscape character is determined by the management and actions of private land owners.

There is no State legislation specifically covering landscape quality, but a range of State Acts including the *Catchment and Land Protection Act 1994*, the *Water Act 1989*, the *Environment Protection Act 1970*, the *Planning and Environment Act 1987*, and the *Flora and Fauna Guarantee Act 1988*, indirectly relate to it.

Air quality

Air within the Spring Creek Catchment is normally of very high quality, but in some locations has periodically been subjected to localised short-term deterioration caused by dust or smoke.

While potential for dust from soil cultivation, or smoke from fires remains, incidence has diminished due to factors including: improved public awareness; soil conservation techniques; changing terms of trade for some cultivation-dependent enterprises; and expanding urbanisation of Torquay.

This is consistent with rural areas generally where dust from land disturbance, smoke from fires (e.g. cool burning of forest areas, or of crop stubble), or odour from enterprises can diminish environmental quality.

The common air pollutants within catchments such as Spring Creek, are likely to include photochemical oxidants (i.e. ozone or O₃) and airborne particles. Particles of less than 10 micrometers and 2.5 micrometres respectively are the greatest health concern as they can be inhaled into the respiratory tract and deep into the lungs.

A number of criteria need to be considered to minimise damage to catchment assets and a nuisance to others. In particular, land managers with potential to impact on air quality should use continuous improvement approaches to management. These require identification of potential hazards and progressive adoption of best practice measures to eliminate or reduce the cause of dust or smoke emissions at their source, or to the maximum extent achievable.

All land managers need to be aware of current regulations.

Visibility objectives for local areas

The current state objective (as defined within the *State Environment Protection Policy (SEPP) (Ambient Air Quality)*) for visibility reducing particles (e.g. smoke and dust) is that local visual distance should not fall below a one-hour average of 20 km on more than three days per year. This measure is not likely to be altered in the short term. (Refer to EPA publication 728).

Greenhouse

A Victorian Greenhouse Strategy is likely to require that emissions of greenhouse gases and energy efficiency be controlled under the *Environment Protection Act 1970*.

Separation distances and odour management

Separation distances or buffers are often used in land use planning to minimise impact of enterprises on others. However, they are not a substitute for effective management of issues at source. Industry Codes of Practice (e.g. for piggery, poultry and feedlot industries in rural areas) are progressively being developed to provide for this.

The management of odours is complex due to the many variables involved in their generation and dispersion. The EPA is responsible for reviewing odour issues, including their nature and human response, associated land use planning issues, and approaches to tackling and resolving difficult odour problems.

Prescribed burning

Burning is undertaken by public authorities (e.g. DNRE), local government, community-based fire brigades and private land managers including farmers and forestry companies. It can be considered an essential tool to reduce the risk of bushfires, for post-harvesting re-establishment in agricultural or forestry enterprises, and for maintaining the health, vigour and diversity of natural ecosystems.

The EPA is proposing to review existing arrangements within government for managing the impacts of prescribed burning to improve their effectiveness.

Domestic solid fuel heating

Domestic wood combustion are major contributors to air emissions in the Port Phillip Region during the cooler months of the year. Regulations to be set under the *Environment Protection Act 1970* will introduce standards for new wood heaters sold in Victoria. They will also commit the EPA to encourage conversion from non-compliant wood heaters to compliant energy efficient units. Correct installation and operation of those units, including appropriate fuel types, is also important for all units.

Main references

The following references explain Victoria's position regarding air quality:

- *Environment Protection Act 1970*
 - *Protecting Victoria's Air Environment: Draft Variation to Victoria's State Environment Protection Policy (Air Quality Management) and State Environment Protection Policy (Ambient Air Quality) and Draft Policy Impact Assessment (EPA 2000: Publication 728).*
-

Noise

Landowners uncertain about whether noise on a farm or on other non-urban land may cause a potential problem should contact the EPA (see appendix 6 for contact details), or refer to appropriate EPA documentation. Relevant Industry Codes of Practice or Management Guidelines (e.g. for the Victorian Flower Growing Industry) may also assist. Assistance may also be available from the Shire or industry experts.

The following discussion also provides a guide.

State environment protection policy acknowledges the restraints and nature of some activities, and exempts them from prescriptive noise management. These include the use of mobile farm machinery (e.g. tractors) in mobile applications, fire pumps, and intruder, emergency or safety alarms (if switched off promptly). Exemptions also include the sporadic use of standby generators, boilers and water pumps used in emergency situations. Where practicable, best practice noise control should be employed.

However, landowners should take all reasonable steps in conducting rural industry practices (e.g. tractor work, harvesting, use of irrigation/spray equipment etc.) to avoid causing excessive noise, particularly at sensitive times (between 10 pm and 7 am) that impacts on people in nearby sensitive locations.

If noise is deemed to be unacceptable, steps should be undertaken to reduce or remove the impact. Consideration may be given, but not confined to:

- regular equipment maintenance;
- muffling machinery and equipment in accordance with Australian Standards;
- installing quieter equipment (e.g. electric motors if practicable);
- changing equipment operating hours to times considered to be least sensitive on potentially affected premises;
- increasing noise insulation (e.g. erect noise barriers; provide noise enclosures);
- relocating equipment to other areas; and
- locating truck access away from nearby dwellings.

Landowners need to be familiar with local by-laws, and are responsible for ensuring that all employees work within a safe noise environment.

Residential developments adjacent to farmlands can be required to provide a buffer area between urban and agricultural areas when a property development is proposed that intensifies noise. However, this does not remove a producer's responsibility to show due diligence in

preventing adverse environmental impact. In some instances, noise barriers could be required during construction programs.

Again, it is important for developers and others to be familiar with local by-laws, and to seek professional advice to cover any uncertainties.

Heritage

The Surf Coast and its environs are expected to witness substantial increases in visitor numbers over the next 20 years. This will mean additional pressure on the area's public lands and open spaces. While this will have benefits, it is important that the condition and values of natural assets, including indigenous cultural sites, are recognised and protected where practicable.

This requires careful planning and management, and much has been done to ensure the long-term viability of the area's public sites without limiting access to the wider community.

The Shire's Environment and Conservation Plan includes the following objectives within its Natural and Cultural Heritage component relevant to this part of the Spring Creek Catchment Plan :

- to protect and enhance the Surf Coast's natural and cultural heritage and maintain its biodiversity;
- to restore degrading environments and manage degrading processes;
- to achieve developments which are sensitive to the environment;
- to achieve greater awareness and understanding about the value of the Shire's natural and cultural places;
- to achieve greater awareness about environmental care and management.

Landscape (as discussed above) is an important element of heritage.

Access to natural heritage areas

It is important to retain access to urban and non-urban parks and reserves (e.g. as listed in Section 3.7) and other natural places including beaches, to the extent that reduced sustainability of natural assets does not occur. This could periodically require restricted or limited access to some sensitive places. The development of management action or environmental management plans over time for such areas is required. This has occurred for a number of nature reserves in the Catchment Plan area.

Community participation and consultation in the development and review of such plans is needed to ensure broad acceptance and ownership of the plans. 'Friends' groups can perform an important role in this process and in the ongoing management of such areas

Aboriginal cultural heritage

The Spring Creek Catchment Plan area lies within the boundaries of the land occupied by the Wathaurong people, which includes much of the Corangamite Region. It is important that this history be recognised and acknowledged in the management of land throughout the region.

Aboriginal sites provide an important link to the past, and are protected under the following State and Federal legislation:

- *The Archaeological and Aboriginal Relics Preservation Act 1972.*
- *The Aboriginal and Torres Strait Islander Heritage Protection Act 1984.*

While both Acts are administered in Victoria by Aboriginal Affairs Victoria (AAV), the Geelong-based Wathaurong Aboriginal Cooperative administers the Acts locally, and is the guardian of local Aboriginal sites. It places high importance on localities with aboriginal artefacts or sites, because associated spiritual connections can extend beyond the boundaries of the sites.

The CCMA has established a Partnership project with the South West Wimmera Cultural heritage project to enable the employment of an experienced indigenous person to work with the Authority on a part time basis for a pilot period of 12 months. The Indigenous Cultural heritage Liaison Officer will provide the vital link between the regions indigenous communities and the CCMA's Land, Water and Biodiversity programs.

Much farmland, rural-residential and urban land in the Spring Creek Catchment Plan area has now been disturbed for many years. The potential for undisturbed cultural sites to be found on those lands is therefore diminished. The potential is greater on forested public lands for unreported sites such as shell middens, stone arrangements, artefact scatters and quarries, oven mounds, scarred trees and burial sites.

Any known sites need to be reported to AAV or the Wathaurong Cooperative for recording and classification, and significant State and Federal penalties apply to persons who willfully deface, damage or otherwise interfere with such objects or places. Owners and managers of private and public lands therefore need to be familiar with legislation covering aboriginal cultural heritage, and should seek advice if clarification is needed.

The Wathaurong Co-operative supports the revegetation of creek and waterway reserves, and requests that proponents of significant revegetation projects proposed for them confer with the Cooperative to determine if any recorded sites are present.

A range of information brochures available from the Wathaurong Cooperative on various types of sites and artefacts are listed in Appendix 5.

Table F4.1: Priority actions for improved catchment amenity

* For actions delegated to the Surf Coast Shire, status is defined as **R** (requires funding/council commitment), **D** (discussions have occurred, but no commitment), **C** (part of a staff member's current work program), **O** (ongoing), **COMP** (completed); **TBD** (to be determined)

Action/Target	Priority	Responsibility	Status*	Comment
Landscape quality				
<ul style="list-style-type: none"> Develop a community program to encourage the preservation and improvement of landscape quality particularly landscape vistas. The program should encourage individuals to recognise that their actions are cumulative with those of others, to impact on the landscape quality, and hence the community's enjoyment of its living environment. Ensure that the planning for, and Council consideration of future subdivisions, takes into account the importance of landscape vistas to and from the subdivision. 	High	Shire	R	Links with Whole Farm Planning.
			COMP	Landscape and Culture Strategy and Streetscape and Landscape Policy are in Surf Coast Shire Planning Scheme.
Air quality				
<ul style="list-style-type: none"> Persons involved in farming activity with the capacity to disturb soil (e.g. via cultivation for cropping, potato farming, flower farming, forestry and viticulture) should implement land conservation measures to minimise or preferably eliminate soil loss by wind, particularly during dry high wind periods. Ensure that future establishments with potential to create offensive odours are situated with adequate buffer zones (in accordance with applicable Codes of Practice) to minimise odour impacts on persons living, working or travelling in the vicinity. 	High	Landowners	O	Individuals' responsibilities.
		Shire	O	Shire policy for intensive animal industries is being developed in collaboration with three other Corangamite Region municipalities. Codes of Practice (for broiler chickens and piggeries) set base.
Noise				
<ul style="list-style-type: none"> Regularly publicise information about noise regulations in publications to residents. 	Medium	Shire	COMP/O	Contained in Shire 'Rural Living' Booklet.
Cultural heritage				
<ul style="list-style-type: none"> Conduct a program to record and protect the catchment's natural and cultural heritage, and to publicise significant heritage sites by appropriate means including signage and booklets. 	Medium	Shire	D	Identified as a strategic planning priority project: requires funding.

Table F4.2: What can I do on my land to improve catchment amenity?

For all lands
<p><i>For landscape quality</i></p> <ul style="list-style-type: none"> • Develop and implement a property management plan covering land use, farm/property improvement, and management schedules. • Manage land within its capability limits, and maintain vigorous plant cover in non-urban areas to avoid land and visual degradation. • Consider the potential landscape impact of developments or land-use change on the landscape (i.e. would you want your neighbour to do the same?) by: <ul style="list-style-type: none"> discussing proposals with others including the Surf Coast Shire; using building materials that are considered to be sensitive to the environment (i.e. blending colours and where appropriate the use of local materials; and using indigenous vegetation in revegetation and amenity planting as the dominant species. • Site houses and other potentially intrusive infrastructure developments (e.g. access roading, power facilities etc.), to comply with good practice to minimise potential adverse impacts on landscapes. • Incorporate landscape design into permit and construction plans, rather than develop them as an afterthought. <p><i>For air quality</i></p> <ul style="list-style-type: none"> • Prepare farm/property management plans in non-urban areas and implement measures to minimise air pollution potential (e.g. by dust etc.) through treed windbreaks, direction, frequency, programming and extent of cultivation and/or earthworks. (Refer '<i>Whole Farm Planning, Principles and Options</i>' DNRE 1993) • Be familiar with and comply with local fire regulations and by-laws. Check with the CFA or the Surf Coast Shire for information. • Minimise burning to amounts necessary for safety or land management, and avoid burning in conditions that will have most effect on others. • Ensure that forward planning of works to involve soil disturbance accounts for dust control, including the stabilising of stockpiled soil by vegetation (e.g. non-invasive grass species) or other means. • Avoid or minimise cultivation of sandy and sandy loam soils, particularly in close proximity to residential areas. • Suspend construction and/or cultivation activities or implement special dust suppression measures during periods of high wind and temperature, or during periods of high visible dust generation. • Develop windbreak plantings and other recommended techniques to reduce wind speed, and hence soil movement at ground level. • Rehabilitate and revegetate disturbed areas as soon as practicable. • Manage equipment and machinery movements at works sites and on farm and other property to minimise dust creation within the reasonable limits of the enterprise. <p><i>For noise</i></p> <ul style="list-style-type: none"> • Act in consideration of other people's reasonable expectations of noise in areas where they live or operate. • Operate vehicles and other mechanical equipment used for farming operations within reasonable limits of farming practice, and where appropriate in consideration of others. • Avoid using mechanical equipment and vehicles, including motor bikes, that are not well maintained, or fitted with silencing equipment that is either standard or compatible with manufacturers recommendations. • Operate sound equipment within reasonable limits, and in urban areas in accordance with EPA regulations. <p><i>For cultural heritage</i></p> <ul style="list-style-type: none"> • Report findings of known or potential indigenous heritage sites to Aboriginal Affairs Victoria. • Arrange for on-site specialist presence when works are undertaken in known sensitive areas. • Manage land to protect any recorded or identified indigenous heritage sites.

Appendices

Appendix 1: Acknowledgements

The contributions of staff from the following organisations is gratefully acknowledged:

- Surf Coast Shire
- Department of Natural Resources and Environment
- Corangamite Catchment Management Authority
- Barwon Water (Waterwatch)
- Wathaurong Aboriginal Cooperative

Spring Creek Catchment Committee

The following Members of the Spring Creek Catchment Committee donated their time and knowledge to the development of this Catchment Plan.

- Mr Keith Grossman (Chair)
- Cr Glenda Shomaly (Secretary)
- Mr Hugh Moore (Deputy Chair)
- Mr Geoffery Holbery-Morgan (Treasurer)
- Ms Lynne Brown
- Ms Claire Gittings
- Mr Alisdair MacLeod
- Mrs Margery Smith
- Mr Graham Sloman
- Mr Neville Sprigg

The Committee also acknowledges the contributions from the following:

- Mr Craig Billows
- Mr Alan Tiller (Editing)
- Individuals and community group that commented on the Draft Catchment Plan
- Learning Services Graphic Design, Deakin University for layout and design
- The Committee also acknowledges the submissions made by community organisations and individuals to the draft Plan and at public meetings.

Appendix 2a: State legislation most relevant to the Spring Creek Catchment Plan

State legislation is available from the State Information Centre, or the State Government web site <www.vic.gov.au>

Act	Purpose
<i>Agricultural and Veterinary Chemicals (Control of Use) Act 1992</i>	Controls the use, application, sale and manufacture of agricultural and veterinary chemical products, fertilisers and stock foods in order to protect human and animal health and the environment.
<i>Catchment and Land Protection Act 1994</i>	The Act applies to landowners and requires the conservation of soil and water resources, avoidance of land degradation and imposes restrictions on noxious weeds and pest animals. (refer to Appendix 2b for relevant Sections).
<i>Dangerous Goods Act 1985</i>	The Act includes the following regulations: <ul style="list-style-type: none"> • Dangerous Goods (Prescribed List) Regulations 1986. • Dangerous Goods (Storage and Handling) Regulations 1989.
<i>Environment Protection Act 1970</i>	The Act establishes the Environment Protection Authority and provides for the protection of the environment from pollution. The following relevant Regulations append to the Act: <ul style="list-style-type: none"> • Environment Protection (Control of Ozone Depleting Substances) Regulations 1990. • Environment Protection (Prescribed Wastes) Regulations 1987. • Environment Protection (Transport) Regulations 1987. • State Environment Protection Policy (Waters of Victoria). • State Environment Protection Policy (Groundwaters of Victoria). • State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1. • Interim Guidelines for Control of Noise from Industry in Country Victoria (1989). • Industrial Waste Management Policy (Waste Minimization) 1990. • Industrial Waste Management Policy (Control of Ozone Depleting Substances) No. IW-1B.
<i>Flora and Fauna Guarantee Act 1988</i>	This Act establishes a legal and administrative structure to enable and promote the conservation of Victoria's native flora and fauna. It provides for a choice of procedures to conserve, manage or control flora and fauna, and to manage potentially threatening processes. It protects all native flora and fauna, and prevents their taking, trading, moving or possession without the appropriate licence or permit.
<i>Planning and Environment Act 1987</i>	The Act establishes a framework for planning the use, development and protection of land in Victoria in the present and long-term interests of all Victorians.
<i>Planning and Environment (Planning Schemes) Act 1996</i>	This Act amends the Planning and Environment Act 1987 to (among other things) provide the format requirements of local government 'new format' planning schemes. It also provides for the preparation of municipal strategic statements and procedures for the issue of planning permits.
<i>Water Act 1989</i>	The purposes of the <i>Water Act 1989</i> are: <ul style="list-style-type: none"> • to state the law relating to water in Victoria; • to provide for the integrated management of all elements of the terrestrial phase of the water cycle; • to promote the orderly, equitable and efficient use of water resources; • to make sure that water resources are conserved and properly managed for sustainable use for the benefit of present and future Victorians; • to maximise community involvement in the making and implementation of arrangements relating to the use, conservation or management of water resources; • to eliminate inconsistencies in the treatment of surface and groundwater resources and waterways;

Act	Purpose
	<ul style="list-style-type: none"> • to provide better definition of private water entitlements and the entitlements of authorities; • to foster the provision of responsible and efficient water services suited to various needs and various consumers; • to provide recourse for persons affected by administrative decisions; • to provide formal means for the protection and enhancement of the environmental qualities of waterways and their in-stream uses; and • to provide for the protection of catchment conditions.
Other Victorian Acts with potential relevance or interest to people living in the Spring Creek Catchment Plan area, and using the Catchment's natural assets.	
<i>The Archeological and Aboriginal Relics Preservation Act 1972</i>	Provides for the protection and recording of Victoria's Archaeological and Aboriginal heritage.
<i>National Parks Act 1975</i>	Provides for the designation of various categories of land for the preservation of natural and cultural features, and for the objectives of management for those categories.
<i>Environment Effects Act 1978</i>	Provides for the requirement for an Environment Effects Statement to be prepared for proposed projects which are deemed by the Minister for Planning to have potential significant environmental impacts.
<i>Mineral Resources Development Act 1990</i>	Encourages an economically viable mining industry which makes the best use of mineral resources in a way that is compatible with the economic, social and environmental objectives of the State.
<i>Coastal Management Act 1995</i>	Provides for: <ul style="list-style-type: none"> • establishment of the Victorian Coastal Council, and Regional Coastal Boards; • coordinated strategic planning and management for the Victorian coast; • preparation and implementation of management plans for coastal Crown land; and • a coordinated approach to approvals for the use and development of coastal Crown land.
<i>Extractive Industries Development Act 1995</i>	<ul style="list-style-type: none"> • Provides for a co-ordinated assessment and approvals process for extractive industries. • Requires extractive industry operations to be carried out with safe operating standards and in a manner that ensures the rehabilitation of quarried land to a safe and stable landform. • Provides a procedure for notification of proposed extractive industries to licence-holders under the <i>Mineral Resources Development Act 1990</i>. • Provides for the payment of royalties for stone extracted from Crown land.

Appendix 2b: Key sections of relevant Acts

The following table provides the content of some key sections and objectives of legislation identified in Appendix 2a. The content is intended as background information only. Other sections relevant to personal interests will also exist. No legal interpretations are provided. Professional advice should be sought for interpretations of Acts and Sections within them.

<i>Catchment and Land Protection Act 1994</i>
<p>Section 20: General duties of land owners</p> <p>In relation to his or her land a land owner must take all reasonable steps to:</p> <ul style="list-style-type: none">• avoid causing or contributing to practices which causes or may cause damage to land of another landowner;• conserve soil;• protect water resources;• eradicate regionally prohibited weeds;• prevent the growth and spread of regionally controlled weeds;• prevent the spread of, and as far as possible eradicate, established pest animals. <p>A land owner must take all reasonable steps to prevent the spread of regionally controlled weeds and established pest animals on a roadside that adjoins the land owner's land.</p>
<i>Environment Protection Act 1970</i>
<p>Section 39: Pollution of waters</p> <p>A person shall not pollute any waters so that the condition of those waters is so changed as to make or be reasonably expected to make those waters:</p> <ul style="list-style-type: none">• noxious or poisonous;• harmful or potentially harmful to the health, welfare safety or property of human beings;• poisonous harmful or potentially harmful to animals, birds, wildlife, fish or other aquatic life;• poisonous, harmful or potentially harmful to plants or other vegetation;• detrimental to any beneficial use made of those waters <p>Without in any way limiting the generality of Sub-Section (1) a person shall be deemed to have polluted waters in contravention of sub-Section (1) if:</p> <ul style="list-style-type: none">• that person causes or permits to be placed in or on any waters or in a place where it may gain access to any waters any matter whether solid, liquid, or gaseous, which:<ul style="list-style-type: none">• is prohibited by or under this Act;• or does not comply with any standard prescribed for that matter; or• that person causes or permits the temperature of receiving waters to be raised or lowered by more than the prescribed limits. <p>A person shall not cause or permit waste to be placed in any position where it could reasonably be expected to gain access to any waters in circumstances where if access was gained the waste would be likely to result in those waters being polluted.</p> <p>A person shall not cause or permit waste to be discharged or deposited onto the dry bed of any waterway in circumstances where if the waterway had contained waters the discharge or deposit would be likely to result in those waters being polluted.</p> <p>A person who contravenes any of the provisions in this section shall be guilty of an offence against this act and liable to a penalty of not more than 200 penalty units and in the case of continuing offence to a daily penalty of not more than 80 penalty units for each day the offence continues after conviction or after service by the Authority of notice of contravention of this section.</p>

Environment Protection Act 1970

Continued

Section 41: Pollution of atmosphere

A person shall not pollute the atmosphere so that the condition of the atmosphere is so changed as to make or be reasonably expected to make the atmosphere:

- noxious or poisonous or offensive to the senses of human beings;
- harmful or potentially harmful to the health, welfare safety or property of human beings;
- poisonous harmful or potentially harmful to animals, birds or wildlife;
- poisonous, harmful or potentially harmful to plants or other vegetation; or
- detrimental to any beneficial use made of the atmosphere.

Without in any way limiting the generality of sub-section (1) a person shall be deemed to have polluted the atmosphere in contravention of sub-section (1) if:

- that person causes or permits to be placed in or so that it may be released into the atmosphere any matter whether solid, liquid, or gaseous, which:
 - is prohibited by or under this Act; or
 - does not comply with any standard prescribed for that matter; or
- that person causes or permits the discharge or emission of any matter or substance into the atmosphere in contravention of this Act;
- that person uses any chemical substance or fuel the use of which is prohibited by the regulations; or
- that person contravenes any regulation dealing with the use of any ozone-depleting substance or the manufacture, assembly, installation, operation, removal, maintenance, sale, or disposal of goods, equipment, machinery, or plant containing or using ozone depleting substance.

Section 44: Discharge/deposit onto land

The discharge or deposit of waste onto land:

- shall at all times be in accordance with declared State environment protection policy specifying acceptable standards and conditions; and
- shall comply with any standards applicable under this Act.

Section 45: Pollution of land

A person shall not pollute land so that the condition of the land is so changed as to make or be reasonably expected to make the land :

- noxious or poisonous;
- harmful or potentially harmful to the health or welfare of human beings;
- poisonous harmful or potentially harmful to animals, birds, or wildlife;
- poisonous, harmful or potentially harmful to plants or vegetation;
- obnoxious or duly offensive to the senses of human beings; or
- detrimental to any beneficial use made of the land.

Without in any way limiting the generality of sub-section (1), a person shall be deemed to have polluted land in contravention of sub-section (1) if:

- that person causes or permits to be placed in or on any land or in any place where it may gain access to any land any matter whether solid, liquid, or gaseous, which:
 - is prohibited by or under this Act;
 - or does not comply with any standard prescribed for that matter; or
- that person establishes on any land
 - a refuse dump;
 - a garbage tip;
 - a soil and rock disposal site;
 - or any other site for the disposal of or as a repository for solid or liquid waste.
 - so as to be obnoxious or unduly offensive to the senses of human beings or interfere with any groundwater.

A person who contravenes any of the provisions in this section shall be guilty of an offence against this act and be liable to a penalty of not more than 200 penalty units and in the case of continuing offence to a daily penalty of not more than 80 penalty units for each day the offence continues after conviction or after service by the Authority of notice of contravention of this section.

Continued

Environment Protection Act 1970

Section 46: Emission of noise

The emission of noise shall at all times be in accordance with the State environment protection policy specifying acceptable conditions for emitting noise and shall comply with any standards or limitations prescribed therefore under this Act.

Planning and Environment Act 1987

Key Victorian planning objectives under this Act that are relevant to catchments include:

- to assist the protection and, where possible, restoration of catchments, waterways, water bodies, groundwater, and the marine environment;
- to assist the control of noise effects on sensitive land uses;
- to assist the protection and conservation of biodiversity, including native vegetation retention and provision of habitats for native plants and animals and control of pest plants and animals;
- to assist the conservation of places that have natural, environmental, aesthetic, historic, cultural, scientific or social significance or other special value important for scientific and research purposes, as a means of understanding our past, as well as maintaining and enhancing Victoria's image and making a contribution to the economic and cultural growth of the State;
- to encourage retention of existing vegetation or revegetation as part of subdivision and development proposals; and
- to ensure that the State's agricultural base is protected from the unplanned loss of high quality productive agricultural land due to permanent changes of land use, and to enable protection of productive farmland which is of high quality and strategic significance in the local or regional context.

The re-use of wastewater including urban run-off, treated sewage effluent and run-off from irrigated farmland should be encouraged where appropriate, consistent with the *Guidelines for Wastewater Re-Use* (EPA 1996).

All municipalities must have a planning scheme, intended to protect land from inappropriate use, and to assist in the conservation and wise use of natural resources including energy, water, land, flora, fauna and minerals. The schemes must identify with State and Municipal land use policies, and define land use zones. They also provide for 'Overlays' within zones which set rules covering specific features of designated land (e.g. for vegetation retention within conservation overlays).

At the State level, appropriate documents may be listed in the *Victorian Planning Provisions* (VPP), to become standard planning provisions applicable to the whole of Victoria, and which cannot be changed by local councils.

Within individual planning schemes, provision also exists for the inclusion of 'Incorporated Documents' which may cover specific land uses and associated regulations. Documents such as Codes of Practice for piggeries and for broiler farms (both in development at time of preparation of this document), may be listed in the VPP, as Incorporated Documents within planning schemes. All requirements within Incorporated Documents, including legislative provisions from various Acts, become binding on all municipalities and landowners.

Planning schemes may also identify Reference Documents, which are not formally incorporated into planning schemes, but which the Council needs to refer to in making planning decisions.

Water Act 1989

The Act contains many Sections and clauses relating to many water issues including:

- access and rights to surface water;
- ground water and treated wastewater;
- regulations regarding the licencing and construction of dams;
- management of rivers;
- streams and water bodies including the allocations of water to and within them;
- establishment of water authorities and organisations; and
- allocation of responsibilities and accountabilities.

People interested in the Act should review its content in the relevant sections, and seek professional interpretation prior to taking any action, particularly where any doubt exists.

Appendix 3: Federal, state, regional, and local strategies, plans and publications relevant to the Spring Creek Catchment Plan

The following table identifies Commonwealth, State, Regional and local plans, strategies and other primary reference documents relevant to the Spring Creek Catchment Plan. The table is a reference guide only, as new materials will regularly emerge to supercede current content. Other existing documents may also have been overlooked. The documents are all available from either the Surf Coast Shire (in Torquay), the Department of Natural Resources and Environment (Colac or Geelong) or the Corangamite Catchment Management Authority (Colac).

State	Regional	Surf Coast Shire	Other (e.g. reference documents, brochures, local notes)
Overarching environmental policies			
Victorian Government environmental policies.		Surf Coast Shire Planning Scheme	
State Planning Policy Framework policy statements on the environment and catchment management.		Surf Coast Shire Environment and Conservation Plan (1996)	
<i>Environment Management Guide for Victorian Agriculture</i> (Victorian Farmers Federation 2001)			
Catchment Management (generic)			
<i>Managing Victoria's Catchments: Partnerships in Action</i> (DNRE 1998)	<i>Corangamite Regional Catchment Strategy Restoring the Balance: Corangamite Regional Salinity Strategy</i> (CCMA 1994)		<i>A Study of the Land in the Catchments of the Ohway Range and Adjacent Plains</i> (SCA 1981)
Biodiversity			
<i>State Biodiversity Strategy</i> (DNRE 1998)	<i>Corangamite Region Draft Native Vegetation Plan</i> (CCMA _____)	<i>Rural and Environment Study – Environmental Resources Report</i> (1996)	<i>Indigenous Trees and Shrubs of the West Port Phillip Region</i> (DNRE)
<i>Commonwealth Environment Protection and Conservation Biodiversity Act 1999</i>		Individual Action Plans for Public reserves including: Ironbark Basin, Grass Tree, and Menzels Nature Reserves	<i>Indigenous vegetation of the Old Geelong Region</i> (DNRE)
<i>Flora and Fauna Guarantee Act 1988</i>		Fire Management Plans for Ironbark Basin, Bellbrae Reserve, Spring Creek West, Grass Tree Park, Deep Creek East and Giddings Road, Menzels Road and Larcombes Road Nature Reserves	<i>Roadside Vegetation of the Surf Coast Shire</i> (Surf Coast Shire)
<i>Victoria's Native Vegetation Management Framework: Restoring our Catchments</i> (DNRE 2002)		Note: Other Action Plans and Fire Management Plans are in preparation.	

State	Regional	Surf Coast Shire	Other (e.g. reference documents, brochures, local notes)
		Shire Biodiversity Incentives Program Video Shire Rural Living Booklet.	
Water quality / Waterway health			
<i>State Environment Protection Policy: Waters of Victoria</i> (EPA) <i>Nutrient Management Strategy for Victorian Inland Waters</i> (EPA 1995) <i>Code of Practice: Septic Tanks</i> (EPA)	<i>(Draft) Regional Nutrients Management Plan</i> (CCMA) <i>(Draft) Regional Waterway Health Strategy</i> (CCMA)		Urban Stormwater Best Practice Environmental Management Guidelines (EPA)
Pest plants			
<i>Draft Victorian Pest Management Framework</i> (DNRE 2001) <i>Victorian Weeds Strategy</i> (DNRE 1999) <i>Strategy for the Management of Serrated Tussock in Victoria</i> (DNRE 1995)	<i>Corangamite Weed Action Plan</i> (DNRE) <i>South West Ragwort Strategy</i> (DNRE) <i>Geelong Patterson's Curse Action Plan</i> (DNRE) <i>Geelong Serrated Tussock Action Plan</i> (DNRE)	<i>'Managing Pest Plants and Animals in the Surf Coast'</i> : Surf Coast Shire Pest Plant and Animal Action Plan Surf Coast Shire Weed Action Plans <i>Surf Coast Roadside Identification Scheme Environmental Weeds – Invaders of our Surf Coast.</i>	Brochures and notes: <ul style="list-style-type: none"> Landcare Notes: <i>Pest Plant Identification: Ragwort</i> Landcare notes: <i>Pest Plant Identification: Serrated Tussock</i> <i>Cost of Serrated Tussock in Central West Victoria</i> <i>Barrabool Hills Serrated Tussock Strategy</i> <i>Woodlots for Serrated Tussock Control</i>
Pest Animals			
The Draft Victorian Pest Management Framework (2001) (DNRE)	<i>(Draft) Corangamite Rabbit Action Plan</i> (DNRE)	Surf Coast Shire Cat Curfew	Brochures: <ul style="list-style-type: none"> <i>Controlling Rabbits in Urban Areas</i> <i>Foxoff: Effectively Reducing Fox Damage in Rural Areas</i> <i>Foxoff baits: Protecting Your Lambs and Australia's Wildlife</i>
Coastal Management			
Victorian Coastal Strategy 2002 (State Coastal Council/DNRE)	<i>South West Regional Coastal Plan</i> (WRCC)	Surf Coast Planning Scheme	

Appendix 4: Vegetation species

The following lists are extracted from: 'Indigenous Trees and Shrubs of the West Port Phillip Region' (DNRE 2000). The 'Point Addis Hinterland' and the 'Spring Creek Valley' as defined for that document includes all of the Spring Creek Catchment Plan area. The lists can be assumed to include the dominant species within the Catchment Plan area as known at the time of publication of the DNRE document, but cannot be assumed to be a complete list of all species.

Spring Creek Valley (Zone 13)

Tree species

COMMON NAME	BOTANICAL NAME	Upper slope	Mid slope	Lower slope & drainage line
Blackwood	<i>Acacia melanoxylon</i>	◆	◆	
Black Sheoke	<i>Allocasuarina littoralis</i>		◆	◆
Drooping Sheoke	<i>Allocasuarina verticillata</i>	◆	◆	
Yellow Gum	<i>Eucalyptus leucoxylon</i>		◆	◆
Messmate	<i>Eucalyptus obliqua</i>	◆		
Swamp Gum	<i>Eucalyptus ovata</i>		◆	◆
Red Ironbark	<i>Eucalyptus sideroxylon sp tricarpa</i>	◆	◆	◆
Manna Gum	<i>Eucalyptus viminalis</i>	◆	◆	◆
Cherry-Ballart	<i>Exocarpus cupressiformis</i>	◆	◆	
Moonah	<i>Melaleuca lanceolata</i>			Creek tidal zones

Shrub and Understorey Species

COMMON NAME	BOTANICAL NAME	Upper slope	Mid slope	Lower slope & drainage lines
Gold-dust Wattle	<i>Acacia acinacea</i>		◆	
Lightwood	<i>Acacia implexa</i>	◆	◆	
Black Wattle	<i>Acacia mearnsii</i>	◆◆	◆	
Hedge Wattle	<i>Acacia paradoxa</i>	◆	◆	
Golden Wattle	<i>Acacia pycnantha</i>	◆	◆	
Varnish Wattle	<i>Acacia verniciflua</i>	◆	◆	◆
Prickly Moses	<i>Acacia verticillata</i>			fresh water
Silver Banksia	<i>Banksia marginata</i>	◆	◆	
Sweet Bursaria	<i>Bursaria spinosa</i>	◆	◆	
Common Everlasting	<i>Chrysocephalum apiculatum</i>	◆	◆	
Hop Bitter-pea	<i>Daviesia latifolia</i>		◆	
Grey Parrot-pea	<i>Dillwynia cinerascens</i>		◆	
Hop Goodenia	<i>Goodenia ovata</i>		◆	◆
Furze Hakea	<i>Hakea ulicina</i>	◆	◆	
Prickly Tea-tree	<i>Leptospermum continentale</i>		◆	◆
Heath (Silky) Tea-tree	<i>Leptospermum myrsinoides</i>		◆	
Common Beard-heath	<i>Leucopogon virgatus</i>	◆	◆	
Sticky Boobiolla	<i>Myoporum viscosum</i>	◆	◆	
Snowy Daisy-bush	<i>Olearia lirata</i>		◆	
Tree Everlasting	<i>Ozothamnus ferrugineus</i>	◆	◆	◆
Large-leaf Bush Pea	<i>Pultenaea daphnoides</i>	◆	◆	
Kangaroo Apple	<i>Solanum laciniatum</i>	occasional	◆	occasional

◆ Species present in remnant vegetation areas

Point Addis Hinterland (Zone 14)

Tree species

COMMON NAME	BOTANICAL NAME	Slopes	Watercourses
Blackwood	<i>Acacia melanoxylon</i>	◆	
Black Sheoke	<i>Allocasuarina littoralis</i>	◆	◆
Victorian Grey Gum	<i>Eucalyptus cypollocarpa</i>	South of Great Ocean Rd	
Scent bark	<i>Eucalyptus aromaphloia</i>	◆	
Brown Stringybark	<i>Eucalyptus baxteri</i>	Scattered on wetter sites	
Yellow Gum	<i>Eucalyptus leucoxylon</i>	isolated	isolated
Messmate	<i>Eucalyptus obliqua</i>	◆	
Swamp Gum	<i>Eucalyptus ovata</i>		◆
Snow Gum	<i>Eucalyptus pauciflora</i>	isolated	isolated
Narrow-leafed Peppermint	<i>Eucalyptus radiata</i>	scattered	
Ironbark	<i>Eucalyptus sideroxylons sp. tricarpa</i>	Ironbark Basin and surrounds	
Manna Gum	<i>Eucalyptus viminalis</i>	well-drained sites	
Cherry Ballart	<i>Exocarpos cupressiformis</i>	◆	

Shrub and understorey species

COMMON NAME	BOTANICAL NAME	Slopes	Watercourses
Silver Wattle	<i>Acacia dealbata</i>		◆
Black Wattle	<i>Acacia mearnsii</i>	◆	
Myrtle Wattle	<i>Acacia myrtifolia</i>	◆	
Hedge Wattle	<i>Acacia paradoxa</i>	◆	
Hop Wattle	<i>Acacia stricta</i>	◆	◆
Sweet Wattle	<i>Acacia suaveolens</i>	◆	
Varnish Wattle	<i>Acacia vernicifolia</i>	◆	
Prickly Moses	<i>Acacia verticillata</i>	wetter sites	◆
Dwarf Sheoke	<i>Allocasuarina misera</i>	◆	
Blunt Everlasting	<i>Argentipallium obtusifolium</i>	open position	
Silver Banksia	<i>Banksia marginata</i>	◆	
Sweet Bursaria	<i>Bursaria spinosa</i>	◆	
Dogwood	<i>Cassinia aculeata</i>	◆	
Common Correa	<i>Correa reflexa</i>	South of area	◆
Leafless Bitter-pea	<i>Daviesia brevifolia</i>	◆	
Slender Bitter-pea	<i>Daviesia leptophylla</i>	◆	
Grey Parrot-pea	<i>Dillwynia cinerascens</i>	scattered	
Smooth Parrot-pea	<i>Dillwynia glaberrima</i>	◆	
Showy Parrot-pea	<i>Dillwynia sericea</i>	◆	
Common Heath	<i>Epacris impressa</i>	◆	
Hop Goodenia	<i>Goodenia ovata</i>	◆	◆
Furze Hakea	<i>Hakea ulicina</i>	◆	
Silky Guinea-flower	<i>Hibbertia sericea</i>	coastal	
Austral Indigo	<i>Indigofera australis</i>	◆	◆
Heath (Silky) Tea-tree	<i>Leptospermum myrsinoides</i>	◆	
Prickly Tea-tree	<i>Leptospermum continentale</i>	occasional	◆
Common Beard-heath	<i>Leucopogon virgatus</i>	◆	
Scented Paperbark	<i>Melaleuca squarrosa</i>		Drainage lines
Sticky Boobiella	<i>Myoporum viscosum</i>	coastal	
Musk Daisy-bush	<i>Olearia argophylla</i>		Isolated (moist gullies)
Twiggy Daisy-bush	<i>Olearia ramulosa</i>	◆	
Cypress Daisy-bush	<i>Olearia teretifolia</i>	◆	
Tree Everlasting	<i>Ozothamnus ferrugineus</i>	open areas	open areas
Shrubby Spurge	<i>Phyllanthus gunnii</i>		◆
Coast Pomaderris	<i>Pomaderris oraria</i>	Coastal up to 1.5 km inland	
Snowy Mint-bush	<i>Prostanthera nivea</i>	isolated	
Large-leaf Bush-pea	<i>Pultenaea daphnoides</i>	◆	
Rough Bush-pea	<i>Pultenaea scabra</i>	◆	
Large Kangaroo Apple	<i>Solanum laciniatum</i>	scattered	
Dusty Miller	<i>Spyridium parvifolium</i>	◆	
Golden Spray	<i>Viminaria juncea</i>	occasional	◆

Key: ◆ Species present in remnant vegetation areas

Appendix 5: Aboriginal heritage information

Information materials available from the Wathaurong Aboriginal Co-operative Ltd, and Aboriginal Affairs Victoria include site identification mini-posters on the following types of artefacts and sites:

Aboriginal Axe Grinding Grooves (#12)
Aboriginal Burials (#5)
Aboriginal Coastal Shell Middens (#13)
Aboriginal Flaked Stone Tools (#4)
Aboriginal Freshwater Middens (#3)
Aboriginal Grinding Stones (#9)
Aboriginal Ground-edge Axes (#8)
Aboriginal Historic Places (#15)
Aboriginal Mounds (#2)
Aboriginal Quarries (#7)
Aboriginal Scarred Trees (#1)
Aboriginal Sites on Private Property (#11)
Aboriginal Surface Scatters (#6)
Aboriginal Rock Art (#14)
Aboriginal Stone Arrangements (#10)

Appendix 6: Contacts

The following are key contact points for information relevant to the Spring Creek Catchment. As personnel and position titles regularly change, only the primary contact point for organisations is provided.

For information on Aboriginal issues:

Wathaurong Aboriginal Cooperative
Morgan Street
North Geelong, Victoria 3215
Telephone 5272 2620

For information or advice on agriculture, flora and fauna, conservation and natural resource management:

Department of Natural Resources and Environment

Geelong

State Public Offices
Little Malop Street (corner Fenwick Street)
Geelong, Victoria 3220
Telephone 13 6186 (i.e. via NRE Statewide Customer Service Centre)

Anglesea

69B Harvey Street
Anglesea, Victoria 3232
Telephone 5263 3712

Internet

www.nre.vic.gov.au

For information and advice on Environment Protection:

Environment Protection Authority

Geelong

State Government Offices
Little Malop Street (corner Fenwick Street)
Geelong, Victoria 3220
Telephone 5226 4825

Internet

www.epa.vic.gov.au

For information and advice on local planning, environment, pest plant and animal and local laws:

Surf Coast Shire

25 Grossman's Road
Torquay, Victoria 3228
Telephone 5261 0600

Internet

www.surfcoast.vic.gov.au

For information on statutory planning:

Department of Sustainability and Environment

180 Fyans Street
Geelong, Victoria 3220
Telephone 5225 2521

Internet

www.dse.vic.gov.au

For information on waterways, waterway management and water quality issues:

Corangamite Catchment Management Authority

64 Dennis Street
Colac, Victoria 3250
Telephone 5232 9100

Internet

www.ccma.vic.gov.au

For information and advice on Waterwatch, and water supply and sewerage issues.

Barwon Water

61 Ryrie Street
Geelong, Victoria 3220
Telephone 5226 2500

Internet

www.barwonwater.vic.gov.au

For local ecological information

ANGAIR

C/o Secretary
PO Box 9
Anglesea, Victoria 3230
Telephone 5263 1085

Appendix 7: References

The following lists some main publications relevant to the Spring Creek Catchment area and issues discussed in this catchment plan. Other publications and Government Acts are identified in Appendix 3. The referenced and identified documents underpin the content of this catchment plan. The reference list does not include legislation which is covered in Appendices 2a and 2b.

Anon. *Fire Management Plans for Nature Reserves of SurfCoast Shire: An Overview*. Surf Coast Shire, 1999

Corangamite Catchment and Land Protection Board. *Corangamite Region Catchment Condition Report 1996*. CCLPB 1996

Corangamite Catchment and Land Protection Board. *Corangamite Regional Catchment Strategy 1997*. CCLPB 1996

Corangamite Catchment Management Authority. *Corangamite Draft Waterway Health Strategy*. CCMA 2001

Corangamite Catchment Management Authority. *Corangamite Regional Nutrient Management Plan*. CCMA 2001

Corangamite Salinity Forum. *Restoring the Balance: A Strategy for Managing Salinity in the Corangamite Salinity Region*. CCSF 1992

David G.A, and Arbuthnot A.A.: *Environment Management Guide for Victorian Agriculture* Victorian Farmers Federation, 2001

DNRE, *Best Practice Guidelines for Manure Management*. DNRE 2000

DNRE, *Code of Practice Piggeries*. DNRE 1992

DNRE, *Draft Corangamite Native Vegetation Management Plan*, DNRE 2000

DNRE, *Draft Corangamite Rabbit Action Plan: Strategic Rabbit Management*. NRE & CCMA, 1998

DNRE, *Corangamite Weed Action Plan 1999-2002 Draft*. NRE & CCMA, 1998

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