NERRENA LANDCARE GROUP BLACK SPUR CREEK WETLAND PROJECT

September 2016























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Introduction

The Nerrena Landcare Group is part of the South Gippsland Landcare Network. Its members live throughout the surrounding communities of Koonwarra, Meeniyan and Leongatha and are passionate about the Black Spur Creek Wetland Area.

The identified project area is special and unique for many reasons which will be explained throughout this report. Land ownership throughout the project area is varied and managed in different ways. The Great Southern Rail Trail is a key feature of the reserve and since the recent opening of the bridges, access to the wetlands has greatly improved, heightening the value and importance of this project.

The bypass of the South Gippsland Highway through the project area that is likely to proceed in the future once funding has been allocated, will impact on the area but also provide opportunities to re-vegetate using the information contained in this document. VicRoads have been very supportive of this project.

This document aims to set out some key guiding principles, projects and important information that can be used by all stakeholders to protect and enhance the project area in the future. The Nerrena Landcare Group is made up of volunteers who will be seeking both funding and on the ground support to implement some of the key actions identified.

Acknowledgements

We are proud to acknowledge Bunurong/Boonwurrung people as the traditional owners of these lands and waters.

The Nerrena Landcare Group would like to acknowledge the contribution of the Project Steering Group, Landcare Committee and Members, Friends of the Great Southern Rail Trail and the South Gippsland Conversation Society who have supported this project. There has been a great deal of effort made to ensure that this planning project will make a difference to the future of this area.

There have been many important stakeholders who have been involved by providing information, support and encouragement in this project and they include;

- West Gippsland Catchment Management Authority
- South Gippsland Shire Council
- South Gippsland Landcare Network
- Great Southern Rail Trail Committee of Management
- VicRoads
- Department of Environment, Land, Water and Planning
- Australian Plant Society

We also acknowledge the funding provided by South Gippsland Shire Council and the consultancy services provided by Hands on Community Solutions.







Methodology

The following key steps were completed during the development of this project:

- A start up meeting was conducted with the Steering Committee in February 2016
- Research and extensive consultation was completed.
- A site inspection was conducted.
- A small video for the project was developed.
- A draft report was presented to the Steering Group and other key stakeholders before presenting it at the Nerrena Landcare AGM in October 2016.
- The final Project Plan will be adopted by the Nerrena Committee and circulated broadly for use.

Project Background

The Black Spur Creek Wetland (BSCW) Project area lies between Koonwarra and Meeniyan; towns linked by the South Gippsland Highway and Great Southern Rail Trail (GSRT). Both of these townships are hubs of human activity with shops, halls, recreation reserves and facilities, and appropriate streetscapes for urban dense housing subdivisions. Exotic trees and plants intermingle with natives.



These towns are embedded in the rural landscape of South Gippsland. A mosaic of rich, intensely farmed agricultural land, lifestyle properties with diverse enterprises, and only scattered native vegetation, shelterbelts and linear reserves, and shade trees. Most wetland areas have been drained and are heavily grazed.

In contrast, the BSCW with GSRT access, offers a unique opportunity to intimately observe natural flora and fauna as well as taking in sweeping views of water and surrounding hills. There are some magnificent ancient Gums. The GSRT provides all perspectives from ground level to trees tops from the historic trestle bridges.





The presence of ancient fossils at the nearby Koonwarra Fish Beds site provides a chance to connect people with stories of evolutionary changes that have taken place over 120,000,000 years.

The BSCW vegetation includes rare Strzelecki Gum Woodlands (Swampy Riparian Woodlands) and this project plans for their conservation and enhancement. Grazing, weed invasion, clearing, increased nutrient levels, altered hydrology, and isolation preventing gene flow are all considered threats to the Strzelecki Gum which is endemic to South and West Gippsland. These Woodlands are listed as Endangered.

Eucalyptus strzeleckii is listed as a Vulnerable species. "Most populations (of Strzelecki Gum) occur on roadsides and pastures with little or no recruitment and ongoing attrition. There is no security for such populations with ultimate extinction likely." Ecology Australia Pty Ltd.

Lucinda David & Andrew Paget July 1944 quotes "5.1 F. Strzelecki Gum (Eucalyptus strzeleckii) Woodland. Rare & endangered state wide – may be already extinct. No conservation reserves contain known remnants of this vegetation. Black Spur Creek confluence is one of 3 remnant sites and has a selection of understory species including Carex iynx."

Only 5% of Endangered Swamp Scrub remains in West Gippsland and Deep Freshwater Marsh is now considered extinct. They are threatened by the same processes as the Strzelecki Gum Woodlands.

Bushland fragmentation, narrow remnant strips and the high ratio of edges to area has eliminated many species of birds, animals and plants from the South Gippsland landscape. The size of BSCW area gives it the potential to provide significant habitat for species requiring intermediate patch size. The project would be an important "node/core" of biodiversity which, linked with wildlife corridors including the GSRT, would add value to the other remnants and revegetation in the district. It could be a significant link for the Strzelecki koalas and even, eventually, lyrebirds.

Scarcity of wetlands remaining in South Gippsland and their importance:

- Useful for flood mitigation.
- Improve water quality in the Tarwin River through slowing runoff and modifying pollutant, nutrient and sediment content.
- Conserve native fish species.
- They provide significant nesting, feeding and habitat value for a range of native wildlife including permanent and migratory birds such as the Australasian Bittern, Intermediate Egret, Royal Spoonbills and Nankeen Night Heron.
- A very significant site for people wishing to observe, study, photograph or depict flora and fauna or natural landscapes.
- Restoration of natural flow regimes in the BSCW could significantly contribute to biodiversity conservation.







The contribution of the BSCW to maintaining health of the Tarwin River is significant as it flows into Anderson Inlet, part of the Bunurong Coastal Landscape Priority Area. It contributes to improved environmental conditions of waterways, estuaries and wetlands.

Demographic Profile

The Shire of South Gippsland is a local government area in Victoria, Australia, located in the south-eastern part of the state. It covers an area of 3,305 square kilometres and at the 2011 Census, had a population of 27,208.

- The age group with the most population is 60-64 years (2,394 persons)
- Our 5 most populous towns are Leongatha (5332), Korumburra (4373), Mirboo North (2,296), Foster (1,677) and Nyora (1,332)
- The main family type is "couples without children" 47% of the population;
- The average household size for the Shire is 2.4 people
- The median age of people residing here is 44 years
- Couples with children make up 26% of the population
- Couples without children are 32.4% with 14% older people

South Gippsland has traditionally been a farming community which has been adversely affected by the recent dairy crisis.



The Great Southern Rail Trail, along with Wilsons Promontory, is a major South Gippsland tourist attraction. This mostly flat or gently undulating trail goes through lush dairy farmland, areas of remnant bush and lowland scrub. It climbs from the foothills of Fish Creek up past Mount Hoddle and then down a steep descent through dense forest out into magnificent views of Wilsons Promontory and Corner Inlet, continuing on to Foster. The 10 km Toora to Welshpool section was opened on 7 February 2015.







The trail is well maintained with a surface of compacted gravel. Koalas and wallabies can often be seen from the trail particularly in the early mornings and evenings.

As of 4 March 2016, the Great Southern Rail Trail has been completed for the full distance (70 kilometre) from Leongatha to Port Welshpool. The new section of rail trail, opened this year through the Black Spur Creek area, has lifted the profile of the area. It is a beautiful and easy to ride section of the trail.

Literature Review

Relevant Plans and Strategies have informed the development of this report including;

- 1. Australia's Biodiversity Conservation Strategy 2010-2030
- 2. DELWP Flora & Fauna Guarantee, Vegetation Plans
- 3. Department of Sustainability & Environment, Vegetation Work Standards, Victorian Investment Framework 2011
- 4. Great Southern Rail Trail. Koonwarra Wetlands. Some Preliminary Comments on Principles for Future Management. 19/08/2005 Sid Cowling
- 5. Great Southern Rail Trail Vegetation Management Plan undertaken by Celia Donnellan, Greening Australia. 2002
- 6. Lucinda David & Andrew Paget. Assessment of Tarwin River System. Board Report July 1994
- 7. Great Southern Rail Trail Extension Proposal
- 8. Koonwarra Fish Beds Geological Reserve Prepared by Mark Simons, Senior Environmental Planner PLS, Department of Sustainability & Environment
- 9. Protecting Victoria's Environment Biodiversity 2036 (Draft)
- Recruitment of Eucalyptus strzeleckii (Myrtaceae) in remnant patches of native vegetation in the Latrobe Valley and South Gippsland, Victoria. Harley Schinagl, Wendy Wright, Philip Rayment. CSIRO publishing, Australian Journal of Botany, 2013, 61, 654-662
- 11. Strzelecki Gum. Eucalyptus strzeleckii. A nationally threatened species. (then) Department of Sustainability and Environment. Copyright the State of Victoria Department of Sustainability and Environment
 - Listed as vulnerable under the Commonwelath Envrironment Protection and Biodiversity Act 1999
 - Listed under the Victorian Flora and Fauna Guarantee Act 1988
 - Listed as Vulnerable under The Advisory list for Victorian Rare or threatened Species (DSE 2006). Strzelecki Gum (Eucalyptus strzeleckii) Survey. Project 06-45. Prepared for: Murray Goulburn Co-operative Co. Ltd. Ecology Australia Pty Ltd
- 12. West Gippsland Native Vegetation Plan 2003. WGCMA
- 13. West Gippsland Regional Catchment Strategy 2009-2013
- 14. South Gippsland Shire Council Plan 2013-2017
- 15. South Gippsland Shire Council Sustainability Strategy 2016-2020
- 16. South Gippsland Shire Council Economic Development & Tourism Strategy
- 17. South Gippsland Shire Council Paths & Trails Strategy.
- 18. Plants and Birds List June 2016, Prepared by volunteers lead by L Norton.







South Gippsland Highway Bypass - Current Status

VicRoads has provided the plans and information about the proposed future bypass that will be developed throughout the project area. There is currently no date set for the commencement of the bypass but VicRoads staff have participated throughout this project and are aware of the significance of the wetlands and are supportive of this project.

Key Project Stakeholders

Consultation for this project has been extensive and has been led by the Nerrena Landcare Group and the South Gippsland Landcare Network who are responsible for the local co-ordination and commitment. The Landcare group has the ability to undertake volunteer works, apply for future grants and provide advice and support to implement this project. However, this will need to be undertaken in partnership with key authorities, land managers and funding requirements.

Landcare do not have the capacity to take on maintenance roles, so projects will need to be undertaken with sustainability in mind.



This photo was taken during a site visit and consultation for the project







The other stakeholders and their roles include;

Organisation Name	Role
West Gippsland Catchment Management Authority	Provide advice to ensure planning and project implementation around the wetlands and waterways is in line with State and Catchment Policy. Advocate for funding and implement works.
Great Southern Rail Trail Committee	Land manager for the Rail Trail easement and some sections of crown land surrounding the trail which are leased by the COM for Income
South Gippsland Shire Council	Provide advice to ensure planning and project implementation falls within shire planning schemes. Provide support and funding for future projects.
Department of Environment, Land, Water and Planning	Underlying land manager. Ensure plans meet their requirements. Provide Biodiversity advice. Strategies.
Vic Roads	Project Management for any future Bypass implementation works, inform the community, plan for future revegetation offsets and consider this report in future planning.
Private Landholders	If interested, participate in Nerrena Landcare Group planning. Undertake complementary vegetation protection, establishment and management on their own properties.
Australian Plant Society	The South Gippsland group encourage and facilitate the growing, conserving and appreciating of Australian Plants. Potentially assist with, volunteer involvement, monitoring, fund raising and educational material.
Museum of Victoria	Share information and have input into plans to ensure geological values are not compromised





Our Vision

"As a beautiful natural area, the Black Spur Creek Wetland delights locals and visitors, its unique ecological functions and features are protected and restored, and it continues to enhance adjoining road, rail trail, lifestyle, educational and farming activities."

Significant Features

We have identified a range of rare and unique features of this area which make it so special including;

- Remnant vegetation including Strzelecki Gum Woodlands, Swamp Scrub and (potentially) Deep Freshwater Marsh and associated flora and fauna.
- Confluence of the West Branch of the Tarwin River and Black Spur Creek.
- Wetlands providing a wide range of services including habitat, flood mitigation, improved water quality, and landscape amenity.
- It is traversed by South Gippsland Highway
- It is traversed by Great Southern Rail Trail including historic (1892) trestle railway bridges providing public access.
- Interesting landforms and 115 myo fossils (Koonwarra Fish Beds Geological Reserve)
- Adjoining private landholdings.
- Approximately 100 acres (40 hectares) of public land with potential to provide significant habitat.
- A place of quiet, soft, natural beauty located between townships of Koonwarra and Meeniyan









Values

This is not a short term plan. It provides a vision for the many stakeholders, in cooperation with the local community, to work towards over the next twenty or more years.

Nerrena Landcare Group especially recognizes the work of the GSRT committee and values the public access the Rail Trail provides. The Rail Trail provides an opportunity to share the unique beauty and natural assets of our local area and this project will enhance the aesthetic, recreational and educational experience for GSRT users.

We have developed the following values to guide future development of this project:

- 1. Acknowledge the traditional landowners and respect the human history of the area.
- 2. Continue to communicate and liaise with relevant public land managers, adjoining landholders and community groups.
- 3. Enhance the experience of the Great Southern Rail Trail users to encourage and attract tourism.
- 4. Restore biodiversity and flow regimes to facilitate improved habitat values.
- 5. Facilitate ongoing research, monitoring, learning and appreciation of the natural features.

Project Areas

The Black Spur wetlands entire project area has been broken down into 6 distinct areas that have a name and theme based on their significance. Each area has been given its own page that lists the key features and identified projects in priority order.

Timelines/Priority

A Priority Scale has been developed for the projects identified which has been based on the possible impact of the bypass, cost involved, significance and current land ownership but the priority will really be driven by future funding opportunities and the willingness of volunteers to actively implement projects;

Very high within 12 months

High 1-3 years Medium 3-10 years

Low future consideration
Ongoing ongoing management





Area Name: 1. Black Spur Wetlands Confluence

Approximate size: 7.86 hectares

- Confluence of Black Spur Creek and the Tarwin River
- Seasonal remnant wetlands currently compromised by grazing and drainage
- Remnant Swamp Scrub and Wetland vegetation
- Weed infestations
- Closest section to Koonwarra
- Potential for synergies with adjoining private land owners
- Below South Gippsland HWY wayside stop
- Significant remnant vegetation should regenerate naturally

Actions Identified	Partners	Cost	Priority
Restore wetland hydrology	WGCMA	\$5,000	Medium
Control of high threat weeds.	All partners	\$8,000	High/ Ongoing
Fencing of adjoining wetland areas.	WGCMA	\$4,000	Medium
Liaise with neighbouring property owners to improve wetlands.	WGCMA/ Landcare	\$3,000	Very High
Revegetation where appropriate	WGCMA/ Landcare	\$5,000	Medium/ Ongoing
Monitor wayside stop for emerging weeds	VicRoads	Maintenance Cost	High/ Ongoing





Approximate size: 3.91 hectares

- High quality understorey with native grasses Open space for tree planting
- Affected by future VicRoads work
- Potential for synergies with adjoining landholders

Actions Identified	Partners	Cost	Priority
Work with VicRoads to develop a revegetation plan	Vic Roads	NA	Medium/in line with bypass
Liaise with adjoining landholders to fence and revegetate Tarwin River	WGCMA	\$20,000	High/Ongoing
Prevent weed invasion	All partners	\$1,000	Medium/ Ongoing
Control priority weeds	All partners	\$4,000	High/Ongoing





Area Name: 3. River Flats/Tree Top Walk

Approximate size: 7.98 hectares

- Scenic with River flats and more distant hillside views
- Potential for synergies with adjoining private landholders
- Elevated Rail Trail bridges with potential to be "tree top" walk/bike ride
- Approximately 6 hectares
- Area currently leased for grazing
- Weeds present

Actions Identified	Partners	Cost	Priority
Phase out grazing on Crown Land areas	DELWP	NA	Low
Restore wetland hydrology – reduce drainage	WGCMA	\$3,000	Medium
Consider "lines of site" to retain aesthetics and diversity of views	GSRT	\$0	Ongoing
Revegetation	All partners	\$50,000	Low
Weed Control	All partners	\$15,000	Medium/Ong oing
Fencing removal and or construction	GSRT	\$3,000	Low
Possible VicRoads re-vegetation	VicRoads		As bypass is implemented





Approximate size: 3.36 hectares

- Significant large old Apple Tree likely derived from Train Passengers
- There are two distinct areas to be broken into East West that will ultimately function as one wetland
- Impacted by highway re-alignment

Actions Identified	Partners	Cost	Priority
Use apple tree to develop human interest story of railway line history	Landcare	\$0	Medium
Liaise closely with Vic Roads to maintain wetland function	WGCMA/ VicRoads/ Council	\$3,000	High
Focus on weed control	All partners	\$10,000	Medium/Ong oing
Revegetate with consideration to sightlines	All partners	\$15,000	Medium/Ong oing





Approximate size: 3.43 hectares

- Views of hills and valley
- Significant weed infestations along the river frontage
- Remnant vegetation and some bare areas
- Opportunity for synergies with adjoining landholders

Actions Identified	Partners	Cost	Priority
Weed control	All partners	\$10,000	Medium/Ong oing
Re-vegetation with consideration to sight lines	All partners	\$15,000	Medium/Ong oing
Liaise with adjoining landholders	WGCMA	\$15,000	Medium





Approximate size: 8.05 hectares

- Access from Minn's Rd Car Park
- River frontage
- Affected by highway realignment
- Approximately 2.3 hectares of cleared land in river bend
- Additionally vulnerable to weed introduction at Minns Road carpark
- Private landholdings slope down to river

Actions Identified	Partners	Cost	Priority
Regular monitoring and control of carpark weeds	VicRoads	Mainten ance cost	High/Ongoing
Weed removal on river frontage	WGCMA	\$15,000	Medium
Re-vegetation of river frontage	WGCMA	\$10,000	Medium
Re-vegetation of part or all of peninsula, this site is suitable for direct seeding	All partners	\$40,000	Low
Liaise with private landholders and encourage participation	WGCMA/ Landcare	\$20,000	Medium
Explore potential for:			
A wheelchair/walking nature trail around the area	GSRT	To be advised	Low
Placing interpretive material focusing on the natural history	GSRT	\$5,000	Low





Future Management Principles

We explored the options for future management of the project area throughout this project. The land is owned and managed by a range of stakeholders and we:

1. Acknowledge the traditional landowners and respect the human history of the area

- Consult with traditional landowners and include costs for this in calculations for funding applications.
- Acknowledge the traditional landowners and incorporate stories of them and more recent European settlers and GSRT history into interpretive material.

2. Continue to communicate and liaise with relevant public land managers, adjoining landholders and community groups

- Annual meetings and/or newsletter updating key stakeholder groups.
- Facilitate vegetation planning which includes regular monitoring, reviews and consideration of follow up management and weed control.
- Establish plant communities with the intent they will be self-regenerating and ongoing maintenance will be minimal.
- Where appropriate, establish memorandums of understanding to establish responsibilities, how decisions are made, and pathways for conflict resolution.
- Help attract resources to develop, implement and maintain vegetation plans.
- Create opportunities for community involvement and encourage volunteers.

3. Enhance the experience of Great Southern Rail Trail users to encourage and attract tourism

- Consider sight lines from the GSRT when planning vegetation restoration.
- With The Great Southern Rail Trail committee, plan to enhance the aesthetic, recreational and educational experiences of rail trail users.

4. Restore biodiversity and ecological function

- Refer to Dept. of Sustainability and Environment, Vegetation Work Standards, Victorian Investment Framework 2011.
- West Gippsland Native Vegetation Plan 2003. WGCMA.
- Restore hydrological function to the wetlands.
- Where fencing is required, encourage the use of plain wire. (Barb-wire fencing is a hazard to wildlife especially Feathertail and Sugar Gliders. See DSE Vegetation Work Standards page 90).
- Systematically prevent, contain, control or eradicate noxious weeds and priority environmental weeds and pest animals (See pages 661 Recruitment of Eucalyptus strzeleckii etc by Schinagl, Wright, & Rayment).
- Continue to monitor vegetation and ensure follow-up maintenance.
- Plan ahead for revegetation to allow time for collection and propagation of appropriate local source material (seed, cuttings).



- If vegetation is removed, try to collect seed before or during removal.
- Retain old and dead trees, whether standing or fallen, for habitat.
- Ensure all revegetation includes a wide range of appropriate understory species for the Strzelecki Gum Woodland and Wetlands. Refer to EVC mapping and documented plant lists.
- Strzelecki Gum should make up the majority (more than 75%) of eucalypts planted, with the proportion increasing to 100% in swampy areas (See pages 658, 660 Recruitment of Eucalyptus strzeleckii etc by Schinagl, Wright, & Rayment).
- Maximise patch size to reduce impacts of "edge" effects (See page 28 WGCMA Native Vegetation Plan 2003).
- Facilitate connectivity for wildlife by constructing underground/overhead "bridges/tunnels" for wildlife where bushland areas are separated by the South Gippsland Highway.
- Encourage and prioritise protection of remnant vegetation, drainage lines, and wildlife corridors to connect other significant bushland areas on adjoining properties.

5. Facilitate ongoing research, monitoring, learning and appreciation of the natural features.

- Encourage interested individuals, community groups, and learning institutions to increase and share knowledge of the area.
- Develop interpretive material and/or signage in cooperation with the Great Southern Rail Trail and, where appropriate, with compatibility of format and style.
- Consult with the Museum of Victoria to develop interpretive material.
- Identify and communicate gaps in knowledge that would assist management and appreciation of the area.
- Seek expert advice on appropriate tunnels/bridges for wildlife to traverse the South Gippsland Highway.





Recommendations & Conclusions

While we have made every effort to collect current and relevant information to inform this project we have identified the following gaps in knowledge:

- Comprehensive flora and fauna lists including amphibians.
- Instream monitoring.
- Comprehensive plan for management or control of Sweet Pittosporum (Pittosporum undulatum).
- Agreed list, mapping and strategies for priority weeds.
- Strategies for pest animals such as rabbits and browsing native fauna such as wallabies.

This work should be completed in future to fully understand the unique Black Spur project area.

Get involved! The Nerrena Landcare Group encourages individuals and other community groups to share their passion for the Black Spur Creek Wetland Area. Perhaps you would like to be a friend of the Black Spur Creek Wetlands. There is a wide scope for volunteers to be involved and contribute a multitude of skills.

The Nerrena Landcare group will continue to advocate and lobby to protect, develop and enhance the Black Spur Wetlands as set out in this report in partnership with other key stakeholders.





Appendices

Appendix 1 - Weeds Management Plan

Determine approach for each individual priority weed in each specific area.

Prevent:

New introductions and emerging weeds – regular monitoring and control especially at Minns Road Car Park, Black Spur Wayside Stop, along GSRT, and newly revegetated areas.

Ongoing education (forums, workshops, leaflets, pamphlets, newspaper articles) with South Gippsland Shire, South Gippsland Landcare Network, Nerrena Landcare Group and Koonwarra and Meeniyan townships, schools, GSRT users.

Identify and map priority weeds.

Contain:

Take measures to ensure current infestations do not spread further.

Destroy new plants.

Control:

Destroy all specimens with reproductive potential (seed, vegetative, bulbs etc).

Eradicate:

Follow-up maintenance - regular monitoring and control of weed regrowth.

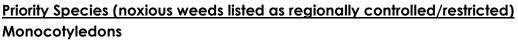
Develop co-operative action with adjoining land managers.

Remove remaining weed specimens.

Monitor:

Regular reviews of the effectiveness of weed priorities and approaches

Regular patrolling and recording of weed presence



Allium triquetrum Angled Onion
Asparagus asparagoides Asparagus Fern

Dicotyledons







Crataegus monogyna Hawthorn Rubus fructicosus agg. Blackberry

Salix spp Willows - various

Genista monspessulana Montpellier or Cape Broom

Senecio jacobaea Ragwort

Carduus tenuiflorus/C.

pycnocephalus Slender/Shore Thistle

Cirsium vulgare Spear Thistle

Monitor and Control (environmental weeds)

Conifers

Cupressus Cypress

Pinus radiata Monterey Pine

Monocotyledons

Agapanthus praecox ssp. orientalis Agapanthus
Galanthus spp Snowdrop
Narcissus spp Daffodil

Tradescantia fluminensis Wandering Creeper

Dicotyledons

llex aquifolium Holly

Hedera helixEnglish IvyErigeron karvinskianusSeaside DaisyErica lusitanicaSpanish Heath

Acacia baileyana Cootamundra Wattle
Acacia decurrens Early Black Wattle
Dipogon lignosus Dolichos Pea

Passiflora tarminiana Banana Passionfruit Pittosporum undulatum Sweet Pittosporum

Cotoneaster sp. Cotoneaster

Malus pumila Apple

Prunus cerasifera Cherry Plum
Coprosma repens Mirror Bush
Solanum mauritianum Tree Tobacco

Solanum pseudocapsicum Madeira Winter Cherry

Potential weeds locally present but not yet recorded in the wetlands area:

Delairea odorata Cape Ivy





Appendix 2 - Revegetation Plan

Draft species lists suitable for revegetation

These lists are compiled for current conditions on public land. Different and more comprehensive lists would be required for land rehabilitation such as after Vic Roads constructions. Similarly, work on private land further from the river and wetlands would require specific lists according to the site.

The aim is to establish a healthy structure of plants which will establish readily and develop favourable habitat for ongoing natural regeneration. In some areas, direct seeding will be the most cost- effective revegetation method.

There are many other species which could be added but have so far been omitted because a) they may be difficult or impractical to propagate & establish or b) the material is already present & the plants might spread adequately through natural regeneration and c) with so little remnant left it is difficult to know what was there.

The current Parks Vic sign at Minns Road is a little misleading because there is no evidence for Melaleuca squarrosa or Leptospermum lanigerum either on the ground or in records/plant lists for the area.

Species suitable for revegetation in Swamp(*) and Riparian Areas (all)

Quantities and proportions of various species will vary for each site code. They will also **vary within each site** according to slope and position relative to flood levels and remnant vegetation already present. In particular, the riparian "Riverbends" requires separate species lists and management actions to the comparatively high ground of the currently cleared and slashed "Peninsula"

Туре	Species	Target Density
Overstorey	*Strzelecki Gum (E. strzeleckii) >75%	50
•	Manna Gum (E. viminalis ssp. viminalis)	plants
	Mountain Grey Gum (E. cypellocarpa)	per ha
	Gippsland Blue Gum (Eucalyptus globulus	
	ssp. pseudoglobulus)	
Understorey Tree	*Silver Wattle (Acacia dealbata)	300
or Large Shrub >	*Blackwood (Acacia melanoxylon)	plants
5m tall	*Muttonwood Myrsine howittiana	per ha
	Blanket-Leaf (Bedfordia arborescens)	
Medium Shrub 1-	Prickly Moses (Acacia verticillata)	800
5m tall	Sweet Bursaria (Bursaria spinosa subsp.	plants
	spinosa)	per ha
	Prickly Currant-bush (Coprosma	
	quadrifida)	
	Hop Goodenia (Goodenia ovata)	
	Hemp Bush (Gynatrix pulchella s.l.)	
	*Tree Violet (Melicytus dentatus s.l.)	
	Prickly Tea-tree (Leptospermum	





continentale)

*Swamp Paperbark (Melaleuca ericifolia)
*Elderberry Panax (Polyscias sambucifolia)
Musk-Daisy Bush (Olearia argophylla)
Hazel Pomaderris (Pomaderris aspera)
Tree Everlasting (Ozothamnus ferrugineus)
Dusty Daisy Bush (Olearia phlogopappa)
Narrow-leaf Wattle (Acacia mucronata)

Golden Tip (Goodia Iotifolia) Victorian Xmas Bush (Prostanthera

lasianthos)

Large Tufted Graminoid (grasses and grass-like tussocks > 1m tall) *Tall Sedge (Carex appressa)

*Golden-Brown Sedge (Carex iynx)
Red-Fruited Saw-Sedge (Gahnia

1500

plants

per ha

sieberiana)

Tasman Flax-lily (Dianella tasmanica)

*Tall Rush (Juncus procerus)
*Pale Rush (Juncus pallidus)

Spiny-headed Mat-rush (Lomandra

longifolia)

Common Tussock-grass (Poa labillardierei)

Species suitable for revegetation in Minns Road Carpark & above Vistas (South) of GSRT.

Quantities and proportions of various species will vary according to slope, position & remnant vegetation already present.

Type Overstorey	Species Acacia dealbata (Silver Wattle) Messmate Stringybark (Eucalyptus obliqua) Stzelecki Gum (Eucalyptus strzeleckii) Narrow-leaf Peppermint (Eucalyptus radiata s.l.) Blackwood (Acacia melanoxylon)	Target Density 50 plants per ha
Medium Shrub 1- 5m tall	Tree Everlasting (Ozothamnus ferrugineus) Hop Wattle (Acacia stricta) Prickly Moses (Acacia verticillata) Narrow-leaved Wattle (Acacia mucronata) Silver Banksia (Banksia marginata) Common Cassinia (Cassinia aculeata) Scrub Sheoak (Allocasuarina paludosa) Sweet Bursaria (Bursaria spinosa subsp. spinosa) Bushy Needlewood (Hakea decurrens) Snowy Daisy Bush (Olearia lirata)	1200 plants per ha



Prickly Tea-tree (Leptospermum continentale)
Heath Tea-tree (Leptospermum myrsinoides)
Hairpin Banksia (Banksia spinulosa)
Broad-leaved Bitter Pea (Daviesia latifolia)
Gorse Bitter Pea (Daviesia ulicifolia)

Hop Goodenia (Goodenia ovata)

Small Shrub < 1m tall 500 plants per ha

Large Tufted Graminoid (grasses and grass-like tussocks > 1m tall) Common Tussock-grass (Poa labillardierei) Tarwin Lily/ Butterfly flag (Diplarrena moraea) 500 plants per ha





Appenidx 3 - Flora and Fauna Sightings- Prepared by Nerrena Landcare

Animals

- Koala 7/8/2015
- Platypus 7/7/16
- Wallaby 17/8/2016
- Echidna 14/9/2016
- Sugar Glider 2016
- Lace Monitor 25/09/16 (neighbouring property)

Introduced

*Rabbit (manure) 5/8/2016

Birds

- Australian Raven 14/7/2016
- Black Duck 14/7/2016
- Black Shouldered Kite 1/8/2016
- Blue Wren 7/7/16
- Bronzewing Pigeon 6/10/2016
- Crimson Rosella 7/7/16
- Chestnut Teal 24/10/2016
- Dusky Woodswallow 6/10/2016
- Eastern Rosella 1/9/2016
- Eastern Spinebill 1/9/2016
- Eastern Yellow Robin 17/8/2016
- Golden Whistler 1/9/2016
- Great Cormorant 6/10/2016
- Grey Butcherbird 7/7/16
- Grey Fantail 7/7/16
- Grey Shrike Thrush 17/8/2016
- King Parrot 24/8/2016
- Kookaburra 17/8/2016
- Little Wattlebird 1/9/2016
- Magpie 14/7/2016
- Magpie-Lark 14/7/2016
- Mountain Duck 7/7/16
- New Holland Honeyeater 5/8/2016
- Naknkeen Kestrel 14/09/16

Introduced

- *Blackbird 14/7/2016
- *Spotted Dove 24/10/2016

Key

- * Species introduced from outside Australia
- ^ Australian native but not in their natural range



- Red Browed Finch 7/7/16
- Rufous Whistler 18/10/2016
- Sacred Kingfisher 18/10/2016
- Silver Eye 9/8/2016
- Striated Pardalotee 2/09/2016
- Striated Thornbill 14/7/2016
- Swamp Harrier 17/8/2016
- Wedge-tail Eagle 31/7/16
- White Eared Honey Eater 14/7/2016
- Whitefaced Heron 7/7/16
- White-throated Tree Creeper 7/7/16
- Whipbird 14/9/2016
- Wood Duck 7/7/16
- Yellow-faced Honeyeater 24/8/2016
- Yellow Tailed Black Cockatoo 7/7/16

Outside natural range

- ^Galah 17/8/2016
- ^Corella 17/8/2016
- ^White Cockatoos 24/8/2016





Appendix 4 - Plant and Bird List Prepared June 2016 lead by L Norton

* Refers to introduced plants and birds

Great Sc	outhern Rail Trail: Koonwarra	- Meeniyan
Family	Botanic name	Common Name
Club Mosses		
Selaginellaceae	Selaginella uliginosa	Tiny Selaginella or Clubmoss
Ferns		
Cyatheaceae	Cyathea australis	Rough Tree Fern
Dennstaedtiaceae	Pteridium esculentum	Austral Bracken
Dryopteridiaceae	Polystichum proliferum	Mother Shield-fern
Gleicheniaceae	Gleichenia sp.	Coral-fern
Pteridaceae	Pteris tremula	Tender Brake
Conifers		
Cupressaceae	*Cupressus sp.	Cypress
Pinaceae	*Pinus radiata	Monterey Pine
Monocotyledons		
Amaryllidaceae	*Allium triquetrum	Angled Onion
Asparagaceae	*Asparagus asparagoides	Asparagus Fern
Asparagaceae	Lomandra filiformis ssp. coriacea	Wattle Mat-rush
Asparagaceae	Lomandra longifolia	Spiny-headed Mat-rush
Asparagaceae	Lomandra longifolia ssp. exilis	
Commelinaceae	*Tradescantia fluminensis	Wandering Creeper
Cyperaceae	Carex appressa	Tall Sedge
Cyperaceae	*Cyperus eragrostis	Drain Flat-sedge
Cyperaceae	Gahnia radula	Thatch Saw-sedge
Cyperaceae	Gahnia sieberiana	Red-fruited Saw-sedge
Cyperaceae	Lepidosperma elatius	Tall Sword-sedge
Iridaceae	Diplarrena moraea	Tarwin Lily
Juncaceae	Juncus pallidus	Pale Rush
Juncaceae	Juncus sp.	Rush
Poaceae	*Anthoxanthum odoratum	Sweet Vernal Grass
Poaceae	*Avena barbata	Bearded Oat
Poaceae	*Briza maxima	Quaking Grass



	T	T
Poaceae	*Cenchrus clandestinus	Kikuyu
Poaceae	*Cynodon dactylon	Couch
Poaceae	*Dactylis glomerata	Cocksfoot
Poaceae	*Digitaria sanguinalis	Summer Grass
Poaceae	*Ehrharta erecta	Panic Veldtgrass
Poaceae	*Ehrharta longiflora	Annual Veldtgrass
Poaceae	Eragrostis sp.	Lovegrass
Poaceae	*Holcus lanatus	Yorkshire Fog
Poaceae	Imperata cylindrica	Blady Grass
Poaceae	*Paspalum dilatatum	Paspalum
Poaceae	*Phalaris aquatica	Phalaris
Poaceae	Phragmites australis	Common Reed
Poaceae	Poa labillardieri	Tussock Grass
Poaceae	Tetrarrhena juncea	Forest Wire-grass
Poaceae	*Sporobolus africanus	Rat's-tail Grass
Restionaceae	Empodisma minus	Spreading Rope-rush
Typhaceae	*Typha latifolia	Bulrush
Xanthorrhoeaceae	Dianella revoluta	Black-anther Flax-lily
Xanthorrhoeaceae	Dianella tasmanica	Tasman Flax-lily
Dicotyledons		
Amaryllidaceae	*Agapanthus	Agapanthus
	praecox ssp.	
Aguifaligaaga	orientalis	Holly
Aquifoliaceae Araliaceae	*Ilex aquifolium *Hedera helix	Holly
Araliaceae		English Ivy
Ardilacede	Polyscias sambucifolia	Elderberry Panax
Asteraceae	*Arctotheca	Capeweed
	calendula	2 3.10 0 0 0 0.
Asteraceae	Cassinia aculeata	Common Cassinia,
		Dogwood
Asteraceae	Cassinia trinerva	Three-veined Cassinia
Asteraceae	*Cirsium vulgare	Spear Thistle
Asteraceae	*Conyza bonariensis	Flax-leaf Fleabane
Asteraceae	Cotula australis	Common Cotula
Asteraceae	*Dittrichia graveolens	Stinkwort
Asteraceae	*Erigeron karvinskianus	Seaside Daisy
Asteraceae	*Hypochaeris radicata	Cat's Ear
Asteraceae	*Leontodon saxatilis	Hairy Hawkbit
Asteraceae	Olearia argophylla	Musk Daisy-bush
	- 5 - 15 - 17 - 12 -	,





A. C.		C. D. L. L.
Asteraceae	Olearia lirata	Snowy Daisy-bush
Asteraceae	Olearia ramulosa	Twiggy Daisy-bush
Asteraceae	Ozothamnus	Tree Everlasting
Asteraceae	ferrugineus	Annual Fireweed
Asieracede	Senecio glomeratus ssp. glomeratus	Annual Fileweed
Asteraceae	Senecio biserratus	Jagged Fireweed
Asteraceae	*Senecio jacobaea	Ragwort
Asteraceae	Senecio minimus	Shrubby Fireweed
Asteraceae	Senecio pinnatifolius	Variable Groundsel
Asteraceae	*Silybum marianum	Variegated Thistle
Asteraceae	*Sonchus asper	Rough Sowthistle
Asteraceae	*Sonchus oleraceus	Common Sowthistle
Bignoniaceae	Pandorea	Wonga Vine
Bigiteria de de	pandorana	, vollage ville
Brassicaceae	*Cardamine hirsuta	Flickweed
Brassicaceae	*Brassica sp.	
Campanulaceae	Wahlenbergia	Bluebell
,	gracilis	
Casuarinaceae	Allocasuarina	Scrub Sheoak
	paludosa	
Ericaceae	*Erica Iusitanica	Spanish Heath
Euphorbiaceae	*Euphorbia peplus	Petty Spurge
Fabaceae	*Acacia baileyana	Cootamundra Wattle
Fabaceae	Acacia dealbata	Silver Wattle
Fabaceae	*Acacia decurrens	Early Black Wattle
Fabaceae	Acacia melanoxylon	Blackwood
Fabaceae	Acacia mucronata	Narrow-leaf Wattle
Fabaceae	Acacia stricta	Hop Wattle
Fabaceae	Acacia verticillata	Prickly Moses
Fabaceae	*Dipogon lignosus	Dolichos Pea
Fabaceae	*Genista	Montpellier Broom
	monspessulana	
Fabaceae	*Medicago	Burr Medic
5.4	polymorpha)
Fabaceae	*Trifolium repens	White Clover
Fabaceae	*Vicia hirsuta	Tiny Vetch
Fabaceae	*Vicia sativa ssp.	Common Vetch
Contiguações	sativa *Centaurium	Common Contains
Gentianaceae	erythraea	Common Centaury
Geraniaceae	Geranium	Cinquefoil Cranesbill
	potentilloides	
Geraniaceae	Geranium sp.	Cranesbill
Goodeniaceae	Goodenia ovata	Hop Goodenia
- COUNCINGCOUC	230deriid Ovald	TIOP COCCOING





Haloragaceae	Gonocarpus sp.	Raspwort
Нурегісасеае	Hypericum	Small St John's Wort
Trypenedeede	gramineum	ornali or soriirs vveri
Lauraceae	Cassytha glabella	Slender or Tangled
	, -	Dodder-laurel
Lauraceae	Cassytha pubescens	Downy Dodder-laurel
Loranthaceae	Amyema pendulum	Drooping Mistletoe
Loranthaceae	Muellerina eucalyptoides	Creeping Mistletoe
Malvaceae	Gynatrix pulchella	Hemp Bush
Malvaceae	*Malva caroliniana	Red-flowered Mallow
Myrsinaceae	Myrsine howittiana	Muttonwood
Myrtaceae	Eucalyptus cypellocarpa	Mountain Grey Gum
Myrtaceae	Eucalyptus kitsoniana	Gippsland Mallee, Bog Gum
Myrtaceae	Eucalyptus obliqua	Messmate Stringybark
Myrtaceae	Eucalyptus ovata	Swamp Gum
Myrtaceae	Eucalyptus radiata	Narrow-leaf Peppermint
Myrtaceae	Eucalyptus strzeleckii	Strzelecki Gum
Myrtaceae	Eucalyptus viminalis	Manna Gum
Myrtaceae	Kunzea sp.	Burgan
Myrtaceae	Leptospermum continentale	Prickly Tea-tree
Myrtaceae	Melaleuca ericifolia	Swamp Paperbark
Myrtaceae	Melaleuca squarrosa	Scented Paperbark
Oxalidaceae	*Oxalis corniculata	Yellow Wood-sorrel
Papaveraceae	*Fumaria sp.	Fumitory
Passifloraceae	*Passiflora tarminiana	Banana Passionfruit
Pittosporaceae	Bursaria spinosa	Sweet Bursaria
Pittosporaceae	Pittosporum undulatum	Sweet Pittosporum
Plantaginaceae	*Plantago lanceolata	Ribwort
Polygonaceae	*Acetosella vulgaris	Sheep Sorrel
Polygonaceae	*Rumex sp.	Dock
Primulaceae	*Lysimachia arvensis	Pimpernel
Proteaceae	Banksia marginata	Silver Banksia
Proteaceae	Hakea decurrens	Bushy Needlewood
Proteaceae	Persoonia juniperina	Prickly Geebung
Ranunculaceae	Clematis aristata	Austral Clematis, Goat's or Old Man's Beard
Ranunculaceae	Clematis glycinoides	Forest Clematis
Ranunculaceae	*Ranunculus repens	Creeping Buttercup







Birds		Animals/other
*Common Blackbird	*Common Blackbird	Antechinus - dead
Australian Magpie	Australian Magpie	
Australian White Ibis	Australian White Ibis	
Crimson Rosella	Eastern Yellow Robin	
Currawong	Grey Butcherbird	
Eastern Yellow Robin	Grey Fantail	
Grey Butcherbird	Noisy Miner	
Grey Fantail	Red Wattlebird	
Grey Shrike-thrush	Superb Fairy-wren	
Laughing Kookaburra	Wedge-tailed Eagle	
Australian Raven	White-throated	
	Treecreeper	
New Holland Honeyeater	Golden Whistler	
Noisy Miner	White-faced Heron	
Red-browed Finch	Swamp Harrier	
White-browed Scrubwren	Willie Wagtail	
White-eared Honeyeater		





Appendix 5 - BSC Wetlands EVC Map

EVC Name: Swampy Riparian Woodland

EVC Group Name: Riparian Scrubs or Swampy Scrubs and Woodlands

 EVC No:
 83

 EVC Group No:
 8

 EVC SubGroup No:
 8.1

 EVC Code:
 0083

 EVC Map Unit Type:
 EVC

 Data Scale:
 100000

Bioregion: Gippsland Plain

Bioregion No: 5.1
Bioregion Code: GipP
Bio EVC: GipP0083
Conservation Status: Endangered

