Contents

TITLE		PAGE	TITLE	F	PAGE
Ackr	nowledgment	i	4.0	Community Engagement	37
Abbreviations		ii	4.1	Significance of threats to assets perceived by	y
Exec	cutive Summary	iii		various managers in the Corangamite region	37
1	Introduction	1	4.2	Community engagement processes in the development of the Corangamite Soil Health Strategy	38
1.1	Purpose of the Corangamite Soil Health Strategy	1	4.3	Community engagement to identify technology needs, attitudes and capacity	
1.2	Understanding the regional environment	3		of asset managers to address high risks	38
1.3	History of land use and its implications for soil health	7	5.0	Investing in soil health	39
1.4	Linkages to national, state and regional		5.1	Investing in priority landscape zones	39
	contexts	9	5.2	Other investment opportunities	44
2	Assets and threats to Assets in the Corangamite Region	11	6.0	Aspirations for soil health, resource condition and management action	
2.1	Asset identification	11		targets	45
2.2	Relative Asset Values	15	6.1	Aspirational target	45
2.3	Identifying threats to assets	17	6.2	Resource condition targets	45
2.4	Other potential and real threats	23	6.3	Management action targets	46
			6.4	Monitoring progress and achievements	48
3.0	Developing investment priorities for the Corangamite Soil Health Strategy	24	7.0	Regional research and development	
3.1	Landscape zones in the Corangamite region	24		and ongoing monitoring activities	49
3.2	Assessing risk to assets – Relative Risk Values	25	8.0	Implementation structure, mechanisms and principles	51
3.3	Relative Risk Values across landscape zones and for various threats	25	0.4	·	
2.4	Assets and threats to assets in each		8.1	Understanding the implementation structure	78
3.4	landscape zone	27	8.2	Predicted costs for implementing the Corangamite Soil Health Strategy	54
3.5	Validation of Relative Risk Values	31	8.3	Principles of implementation	56
3.6	Investment priorities for the Corangamite Soil Health Strategy	35			

TITLE		PAGE	TITLE		PAGE
References		57			
A.1 Land A.2 Wate A.3 Acid	A be addressed by the Strategy dslides er erosion (sheet/rill and gully/tunnel erosion) d sulphate soils condary salinity	59 59 60 62 63	Land (NDIX C use, assets, threats and relative risk values idscape zones Woady Yaloak Gellibrand Bellarine	77 77 79 81
A.5 Wat A.6 Win A.7 Soil A.8 Soil A.9 Soil A.10 Soil	terlogging and soil structure decline and erosion anutrient decline acidification contamination organic carbon (matter) decline biota decline	64 66 67 67 68 69 70	C.4 C.5 C.6 C.7 C.8 C.9 C.10 C.11	Thompsons Upper Barwon Curdies Lismore Moorabool Leigh Stony Rises Otway Coast	83 85 87 89 91 93 95
B.1 Data B.2 Rela B.3 Exa B.4 Sen B.5 Rela	, examples and results for prioritisng	71 71 71 72 74 75	C.12 C.13 C.14 C.15	Hovells Murdeduke Middle Barwon Aire	99 101 103 105

TITLE		PAGE	TITLE	
			List of Figures	
	ENDIX D: Processes and results for validating	107	Figure 1.1	Municipalities of the Corangan
D.1	stment priorities Validation of risks	107	Figure 1.2	Annual average rainfall in the Cregion
	Secondary salinity Landslides Water erosion	107 107 109	Figure 1.3	The three major geomorphic d (Joyce et al. 2004), and the ele land throughout the Corangam
	Acid sulphate soils	112	Figure 1.4	Simplified soil types in the Corregion, based on soil parent m
D.2	Impact on high value public assets	112	Figure 1 F	
	ENDIX E munity engagement processes and results	113	Figure 1.5 Figure 2.1	Land use in the Corangamite r Waterways and Water Supply I Areas in the Corangamite region
E.1	Community engagement logic and methodology	113	Figure 2.2	Bioregions defined for the Corregion
E.2	Community engagement results in priority areas	115	Figure 2.3	Wetlands and significant biodinareas in the Corangamite region
Com	APPENDIX F Common management actions used to address soil-based threats APPENDIX G An example data sheet for monitoring the progress of targets APPENDIX H		Figure 3.1	Fifteen landscape zones in the Corangamite region
			Figure 3.2	Aggregate Relative Risk Values soil threat in the Corangamite
of tar			Figure 3.3	Aggregate Relative Risk Values threats for 15 landscape zones Corangamite region
	mptions used for the Soil Health Strategy	128	Figure 3.4	Remediated landslide next to on the Barham Valley (Otway Coa
Back APPE	ENDIX I ground reports for the Soil Health Strategy ENDIX J eholders involved with the development of	129	Figure 3.5	Severe sheet, rill and gully eros contributing large sediment loa potential nutrient discharge into Creek (Woady Yaloak)
the S	Soil Health Strategy	130	Figure 7.1	Illustrates the key research cor of the Soil Health Strategy
			Figure 8.1	The flow diagram shows the fra

LIST OF FIG	uies	
Figure 1.1	Municipalities of the Corangamite region	3
Figure 1.2	Annual average rainfall in the Corangamite region	4
Figure 1.3	The three major geomorphic divisions (Joyce et al. 2004), and the elevation of land throughout the Corangamite region	5
Figure 1.4	Simplified soil types in the Corangamite region, based on soil parent materials	6
Figure 1.5	Land use in the Corangamite region	8
Figure 2.1	Waterways and Water Supply Proclaimed Areas in the Corangamite region	12
Figure 2.2	Bioregions defined for the Corangamite region	13
Figure 2.3	Wetlands and significant biodiversity areas in the Corangamite region	14
Figure 3.1	Fifteen landscape zones in the Corangamite region	24
Figure 3.2	Aggregate Relative Risk Values for each soil threat in the Corangamite region	26
Figure 3.3	Aggregate Relative Risk Values from soil threats for 15 landscape zones in the Corangamite region	27
Figure 3.4	Remediated landslide next to dwelling in the Barham Valley (Otway Coast)	32
Figure 3.5	Severe sheet, rill and gully erosion contributing large sediment loads with potential nutrient discharge into Moonlight Creek (Woady Yaloak)	33
Figure 7.1	Illustrates the key research components of the Soil Health Strategy	49
Figure 8.1	The flow diagram shows the framework for investment for the Soil Health Strategy throug the Corangamite Catchment Management Authority investment process. Dashed lines indicate reporting back to investors	gh 52
Figure 8.2	Predicted costs of implementing the Corangamite Soil Health Strategy, annually, from 2007 to 2012	54

PAGE

TITLE		PAGE	TITLE	ı	PAGE
Figure A1	A landslide that has destroyed a road in the Corangamite region	59	Figure A18	Areas of moderate, high and very high soil acidification susceptibility in the Corangamite region	68
Figure A2	The location of landslides in the Corangamite region	59	Figure A19	Illustrates two soils from neighbouring	
Figure A3	Processes associated with tunnel erosion development	60		paddocks, soil 'A' has high organic carbon levels, while soil 'B' has lower carbon levels due to land management practices	69
Figure A4	The start of an active gully erosion site which washed sediments into a tributary		Figure A20	A Soil Mite commonly found in soils	70
Figure AF	of the Leigh River	60	Figure B1	Relative Risk Values for the Upper Barwon Landscape Zone	74
Figure A5	The location of sheet and rill erosion sites in the Corangamite region	61	Figure C1	Land use in the Woady Yaloak Landscape	77
Figure A6	The location of gully and tunnel erosion sites in the Corangamite region	61	Figure C2	Zone in 2000-2002 The rank and Relative Risk Values for	77
Figure A7	Drainage channels contaminated by high levels of acidity leached from disturbed			soil-threatening processes in the Woady Yaloak Landscape Zone	78
Figure AO	acid sulphate soils	62	Figure C3	Land use in the Gellibrand Landscape Zone in 2000-2002	79
Figure A8	Predicted locations of potential acid sulphate soils in the Corangamite region	62	Figure C4	The rank and Relative Risk Values for	
Figure A9	A secondary salinity discharge site found in the Corangamite region clearly shows			soil-threatening processes in the Gellibrand Landscape Zone	80
	bare areas and salt-tolerant species	63	Figure C5	Land use in the Bellarine Landscape Zone in 2000-2002	81
Figure A10	Location of secondary salinity discharge sites in the Corangamite region	63	Figure C6	The rank and Relative Risk Values for	01
Figure A11	Illustrates pugging in waterlogged soils caused by dairy cattle, leading to soil			soil-threatening processes in the Bellarine Landscape Zone	82
	structure decline	64	Figure C7	Land use in the Thompsons Landscape Zone in 2000-2002	83
Figure A12	Areas of high to very high waterlogging susceptibility in the Corangamite region	65	Figure C8	The rank and Relative Risk Values for	00
Figure A13	Areas of high to very high soil structure decline susceptibility in the Corangamite			soil-threatening processes in the Thompsons Landscape Zone	84
	region	65	Figure C9	Land use in the Upper Barwon Landscape Zone in 2000-2002	85
Figure A14	Wind erosion in fallowed paddock	66	Figure C10	The rank and Relative Risk Values for	00
Figure A15	Areas of high to very high wind erosion susceptibility in the Corangamite region	66	rigule 010	soil-threatening processes in the Upper Barwon Landscape Zone	86
Figure A16	Areas of moderate, high and very high soil nutrient decline susceptibility in the		Figure C11	Land use in the Curdies Landscape Zone in 2000-2002	87
	Corangamite region	67	Figure C12	The rank and Relative Risk Values for	51
Figure A17	Processes associated with acidification through nitrate leaching	67	riguit 012	soil-threatening processes in the Curdies Landscape Zone	88

TITLE		PAGE	TITLE		PAGE
	Land use in the Lismore Landscape Zone in 2000-2002	89	Figure C28	The rank and Relative Risk Values for soil-threatening processes in the Middle Barwon Landscape Zone	104
Figure C14	The rank and Relative Risk Values for soil-threatening processes in the Lismore Landscape Zone	90	Figure C29	Land use in the Aire Landscape Zone in 2000-2002	105
Figure C15	Land use in the Moorabool Landscape Zone in 2000-2002	91	Figure C30	The rank and Relative Risk Values for soil-threatening processes in the Aire Landscape Zone	106
Figure C16	The rank and Relative Risk Values for soil-threatening processes in the Moorabool Landscape Zone	92	Figure D1	The overlap between the Corangamite Salinity Action Plan target areas (hatched) and the four landscape zones where	
Figure C17	Land use in the Leigh Landscape Zone in 2000-2002	93		secondary salinity is a priority in the Corangamite Soil Health Strategy	107
Figure C18	The rank and Relative Risk Values for soil-threatening processes in the Leigh	0.4	Figure D2	New failure below recent remedial works on Turtons Track (Gellibrand Landscape Zone)	110
Figure C19	Landscape Zone Land use in the Stony Rises Landscape Zone in 2000-2002	94 95	Figure D3	Forestry and logging with minor landslides and erosion on waterway just off the Great Ocean Road (Aire Landscape Zone)	110
Figure C20	The rank and Relative Risk Values for soil-threatening processes in the Stony	0.0	Figure D4	Landslides adjacent to Scrubby Creek (Upper Barwon Landscape Zone)	110
Figure C21	Rises Landscape Zone Land use in the Otway Coast Landscape Zone in 2000-2002	96 97	Figure D5	The pale areas indicate areas of sheet, rill and gully erosion in the Moonlight Creek area (Woady Yaloak Landscape Zone)	112
Figure C22	The rank and Relative Risk Values for soil-threatening processes in the Otway		Figure D6	A gully erosion site along Eclipse Creek (Moorabool Landscape Zone)	112
Figure C23	Coast Landscape Zone Land use in the Hovells Landscape Zone in 2000-2002	98 99	Figure D7	A gully erosion site connecting with a tributary close to the entry of the Leigh River (Leigh Landscape Zone)	112
Figure C24	The rank and Relative Risk Values for soil-threatening processes in the Hovells Landscape Zone	100		,	
Figure C25	Land use in the Murdeduke Landscape Zone in 2000-2002	101			
Figure C26	The rank and Relative Risk Values for soil-threatening processes in the Murdeduke Landscape Zone	102			
Figure C27	Land use in the Middle Barwon Landscape Zone in 2000-2002	103			

TITLE	,	PAGE	TITLE	,	PAGE
List of Ta	bles		Table 8.2	Other investors who support soil health	
Table 1.1	Soil Health Strategy linkages with other natural resource management initiatives in the Corangamite region	10	Table 8.3	activities across south-west Victoria Investment provided by the Australian	53
Table 2.1	Relative Asset Values (RAV) assigned to secondary and cultural and heritage			and Victorian governments through the Corangamite CMA for all soil health-based activities 2003 to 2007	54
Table 2.2	asset classes Identification of potential risk of soil-related threatening processes to asset classes	16 17	Table 8.4	Estimated strategy implementation costs characterised by resource condition targets and management action targets	55
Table 2.3	Definition of soil-threatening processes addressed by the SHS, with illustrative photographs and distribution in the		Table B1	Relative Severity Factor (RSF) assigned to threatening processes	72
Table 2.4	Corangamite region Threats to assets, triggering factors and	18	Table B2	Calculation of relative risk from soil waterlogging in the Upper Barwon	73
	consequences	21	Table B3	Landscape Zone Calculation of relative risk from gully erosion	73
Table 2.5	Features of climate change, implications and potential actions to address threats	23		in the Upper Barwon Landscape Zone	73
Table 3.1	Twenty highest Relative Risk Values for soil threats in the Corangamite region	26	Table B4	Ranking of soil-based threats for each landscape zone according to calculated Relative Risk Values	75
Table 3.2	Individual assets under threat within landscape zones, showing their locations and the top five Relative Risk Values (described by threat) in each landscape zone	28	Table D1	Field verification scores for landslide risk in priority areas. Risk to assets is indicated as very high-5, high-4, medium-3, low/medium-2, low-1.	109
Table 3.3	Field verification scores for landslide risk in the highest Relative Risk Value landscape zones. Risk to assets is indicated as: very high-5; high-4; medium-3; low/medium-2; low-1	32	Table D2	Field verification scores for water erosion risk in priority areas. Risk to assets is indicated as very high-5, high-4, medium-3, low/medium-2, low-1	111
Table 3.4	Field verification scores for water erosion in the five highest Relative Risk Value landscape zones. Risk to assets is indicated as: very high-5; high-4; medium-3;		Table E1 Table F1	Ability of asset managers in the Corangamite region to identify and address priorities in the Soil Health Strategy Risks to assets caused by threats, and	115
Table 3.5	low/medium-2; low-1 Summary of the costs and benefits	33		management practices implemented to address these threats	125
Table 3.6	considered in the economic analysis Final ranked 20 investment priorities, based on risk to assets, benefit-cost analysis	35	Table F2	Current adoption of soil health-based best management practices from asset managers in the Corangamite region	126
Table 4.1	and high-value public assets at risk Asset managers, assets and threats	36 37	Table G1	Examples of targets in the Soil Health	
Table 5.1	Actions to address the 20 highest-validated priorities for investment by landscape zone	39		Strategy and methods of how they may be monitored to determine whether they	107
Table 6.1	Resource condition targets for the Corangamite Soil Health Strategy	46	Table J1	steering committee for development	127
Table 6.2	Management action targets for the Corangamite Soil Health Strategy	47		of Draft 1 and Final Corangamite Soil Health Strategy	130
Table 6.3	Monitoring activities to measure progress towards and achievement of resource condition targets (Table 6.1) and		Table J2 Table J3	Technical organisations contributing to the development of the Corangamite Soil Health Strategy Other technical contributors to the	130
Table 7.1	management action targets (Table 6.2) Research and development actions for the Corangamite Soil Health Strategy	48 50	IANIE JS	development of the Corangamite Soil Health Strategy	130
Table 8.1	Current investment opportunities for the Soil Health Strategy through the Corangamite CMA (2006/08)	53		AND THE PERSON NAMED IN	