

Glenelg Strategic Land Use Study

Volume One



August 2010

Strategic Land Use Study Volume One

Table of Contents

Glenelg Strategic Land Use Study	1
Volume One	1
August 2010	1
Strategic Land Use Study Volume One	2
Executive Summary	12
1.1 Introduction	12
1.2 Zone Analysis	12
1.2.1 Business 1 Zone	12
1.2.2 Business 4 Zone	13
1.2.3 Industrial Zones (IN1, IN2, IN3)	13
2 Preamble	15
Section 1 Introduction to Glenelg	18
3 Introduction	18
4 Demographics of Glenelg Shire	19
4.1 Population Movements	21
4.2 Labour Force Participation	22
4.3 Employment in the Shire	23
4.4 Employment Trends	24
4.5 Income Levels	25
4.6 Industry Structure	26
5 Land Characteristics of Glenelg	29
5.1 Agriculture Forestry and Mineral Extraction Activities in Glenelg	31
5.2 Forestry	32
5.3 Agriculture	32
6 Soils	42
6.1 Introduction	42
7 Current Climate Conditions	45
7.1.1 Rainfall	45
7.1.2 Casterton	45
7.1.3 Heywood	46
7.1.4 Portland	47
7.1.5 Nelson	47
7.2 Climate Data	48
7.2.1 Casterton	48
7.2.2 Heywood	49
7.2.3 Portland	49
7.3 Future climate forecast and impacts through the advent of Climate Change	50
8 Flooding Patterns in Glenelg	50
8.1 Introduction	50

8.1.1	Casterton Flooding.....	50
8.1.2	Heywood Flooding.....	52
8.1.3	Portland flooding	53
9	Wind Erosion	54
10	Salinity.....	55
11	Mass Movement (Earthquakes and Soil Movements)	55
12	Cliff and Shoreline.....	56
Section 2 Planning Zones.....		58
13	Current Glenelg Planning Zones.....	58
13.1.1	Physical Development Constraints	60
14	Glenelg Biodiversity	69
14.1	Bridgewater Bioregion.....	70
14.2	Bridgewater Bioregional Landscape.....	71
14.2.1	Public and Private Land.....	71
14.2.2	Climate, Geology and Drainage.....	72
14.2.3	Landscape and Land Use	72
14.2.4	Implications for biodiversity conservation	73
14.2.5	Priority Biodiversity Actions for the Bridgewater.....	74
14.3	Glenelg Plain Bioregion.....	74
14.3.1	Climate, Geology and Drainage.....	74
14.3.2	Landscape and land use	75
14.3.3	Implications for Biodiversity Conservation.....	76
14.3.4	Priority Biodiversity Actions for Glenelg Plains Bioregion.....	78
14.4	Dundas Tableland Bioregion	79
14.4.1	Public and Private Land.....	81
14.4.2	Climate, Geology and Drainage.....	81
14.4.3	Landscape and Land Use	82
14.4.4	Implications for biodiversity conservation	84
14.4.5	Priority biodiversity Actions for Merino Landscape Zone	84
15	Current Victorian Planning Framework.....	85
15.1	Planning in Rural Areas	85
15.1.1	Introduction.....	85
15.2	Planning	85
15.2.1	Rural.....	87
15.2.2	Biodiversity.....	87
15.2.3	Flooding.....	87
Section 2 Individual Planning Analysis.....		89
16	Business Zones.....	89
16.1	Rational for Business 1 Zone Inclusion in the Study.....	89
16.2	B1 Zone.....	89
16.2.1	Purpose.....	89
16.3	Land use.....	90
16.3.1	Current Land Use Analysis.....	92
16.3.2	Current B1Z Portland.....	98
16.3.3	Fire Proneness of the Zone	99
16.3.4	Land Use Impediments	99

16.3.5	Forecast Population over the next 20 years	100
16.3.6	Levels of Fragmentation and building utilization in the Zone.....	100
16.3.7	Subdivision Permits	100
16.4	Parking and Traffic Movements	106
16.4.1	Block1	108
16.4.2	Block 2	109
16.4.3	Block 3	109
16.4.4	Block 4.....	110
16.4.5	Block 5	111
16.4.6	Block 6.....	112
16.4.7	Block 7	113
16.4.8	Current B1Z Portland Soil Characteristics	116
16.4.9	Current B1Z Casterton.....	117
16.4.10	Fire Proneness of the Zone	118
16.4.11	Land Use Impediments	118
16.4.12	Forecast Population over the next 20 years	118
16.4.13	Levels of Fragmentation in the Zone	119
16.4.14	Subdivision Permits	119
16.4.15	Parking and Traffic Movements	119
16.4.16	Current Casterton Soil Characteristics.....	119
16.4.17	Current B1Z Heywood.....	120
16.4.18	Fire Proneness of the Zone	121
16.4.19	Land Use Impediments	121
16.4.20	Forecast Population over the next 20 years	121
16.4.21	Levels of Fragmentation in the Zone	121
16.4.22	Subdivision Permits	121
16.4.23	Parking and Traffic Movements	121
16.4.24	Current Heywood Soil Characteristics.....	122
16.4.25	Retail Activity.....	122
16.5	Challenges and Options	124
16.5.1	Challenges.....	124
16.5.2	Options.....	124
16.6	B1 Zone Needs Summary	125
17	B4 Zone.....	126
17.1	Rational for Business 4 Zone Inclusion in the Study.....	126
17.2	Purpose.....	126
17.3	Land Use	127
17.3.1	Current Land Use Analysis.....	127
17.3.2	Current B4Z Portland.....	130
17.3.3	Fire Proneness of the Zone	131
17.3.4	Land Use Impediments	131
17.3.5	Forecast Population over the next 20 years	132
17.3.6	Levels of Fragmentation and building utilization in the Zone.....	132
17.3.7	Subdivision Permits	133
17.3.8	Parking and Traffic Movement.....	134
17.3.9	Current B4Z Portland Soil Characteristics	134

17.4	Current B4Z Casterton.....	135
17.4.1	Fire Proneness of the Zone	136
17.4.2	Land Use Impediments	136
17.4.3	Forecast Population over the next 20 years	137
17.4.4	Levels of Fragmentation in the Zone	137
17.4.5	Subdivision Permits	137
17.4.6	Parking and Traffic Movements	137
17.4.7	Current Casterton Soil Characteristics.....	137
17.5	Current B4Z Heywood.....	138
17.5.1	Fire Proneness of the Zone	138
17.5.2	Land Use Impediments	138
17.5.3	Forecast Population over the next 20 years	139
17.5.4	Levels of Fragmentation in the Zone	139
17.5.5	Subdivision Permits	139
17.5.6	Parking and Traffic Movements	139
17.5.7	Current Heywood Soil Characteristics.....	139
17.5.8	Retail Activity.....	139
17.6	Challenges and Options	139
17.6.1	Challenges.....	140
17.7	B4 Z Needs Summary.....	140
18	Industrial Zones	140
18.1	Rational for IN1 Zone Inclusion in the Study.....	140
19	INZ 1 Zone.....	140
19.1	Purpose.....	140
19.2	Land Use	142
19.3	Current Land Use Analysis.....	143
20	Current IN1 Z Portland.....	145
20.1	Fire Proneness of the Zone	147
20.2	Land Use Impediments	147
20.3	Levels of Land Use Fragmentation.....	147
20.3.1	Subdivision Permits	147
20.4	Current IN1Z Portland Soil Characteristics.....	152
21	Current IN1Z Heywood	154
21.1	Fire Proneness of the Zone	155
21.2	Land Use Impediments	155
21.2.1	Levels of Fragmentation in the Zone	155
21.2.2	Subdivision Permits	156
21.3	Current IN1Z Heywood Soil Characteristics.....	156
22	Current IN1Z Casterton	156
22.1	Fire Proneness of the Zone	158
22.2	Land Use Impediments	158
22.3	Levels of Fragmentation in the Zone	158
22.3.1	Subdivision Permits	158
22.4	Current IN1Z Casterton Soil Characteristics.....	158
22.5	Challenges and Options	158
22.5.1	Challenges.....	158

22.5.2	Options.....	159
23	IN2 Zone.....	159
23.1	Rational for IN2 Zone Inclusion in the Study.....	159
23.2	Purpose.....	159
23.3	Current Land Use.....	160
24	Current IN2 Portland.....	163
24.1	Fire Proneness of the Zone.....	163
24.2	Land Use Impediments.....	163
24.3	Land Use Fragmentation.....	163
24.3.1	Subdivision Permits.....	163
24.4	Current IN2Z Portland Soil Characteristics.....	166
24.5	Challenges and Options.....	169
24.5.1	Challenges.....	169
24.5.2	Options.....	169
25	IN3 Zone.....	169
25.1	Rational for IN3 Zone Inclusion in the Study.....	169
25.2	Purpose.....	169
25.3	Current Land Use.....	170
26	Current IN3Z Portland.....	171
26.1	Fire Proneness of the Zone.....	172
26.2	Land Use Impediments.....	172
26.3	Land Use Fragmentation.....	173
26.3.1	Subdivision Permits.....	173
26.4	Current IN3 Z Portland Soil Characteristics.....	175
27	IN3 Heywood.....	175
27.1	Fire Proneness of the Zone.....	176
27.2	Land Use Impediments.....	176
27.3	Land Use Fragmentation.....	176
27.3.1	Subdivision Permits.....	177
27.4	Current IN3Z Heywood Soil Characteristics.....	177
27.5	Challenges and Options.....	177
27.5.1	Challenges.....	177
27.5.2	Options.....	177

Tables

Table 1 Demographic Profile of Glenelg.....	20
Table 2 Population Age Breakdown for Glenelg.....	21
Table 3 Glenelg population Movements 2001 - 2006	21
Table 4Glenelg Shire Employment Status.....	22
Table 5 Glenelg Labour Force Participation.....	23
Table 6 Industries in Glenelg and their respective employment numbers.....	24
Table 7 Glenelg Income Levels	25
Table 8 Business by Industry by Employment Size 2006	26
Table 9 Business by industry by turnover.....	27
Table 10 Glenelg 10 largest land use activities	29
Table 11 The remaining 27 Land use activities in Glenelg by area.....	31
Table 12 Agriculture, Forestry, Quarry Activity in Glenelg	32
Table 13 Soils of Glenelg	43
Table 14 Processes impacting on the Glenelg Cliffs and Shoreline	56
Table 15 Processes impacting on the Glenelg Cliffs	57
Table 16 Current Glenelg Planning Zones.....	58
Table 17 Portland Drainage Infrastructure Issues.....	62
Table 18 Portland Water Services Assessment.....	64
Table 19 Portland Sewer Services Assessment	64
Table 20 Heywood Development Constraints	67
Table 21 Casterton Development Constraints	68
Table 22 Land Use in the Bridgewater Bioregion	72
Table 23 total area of Pre 1750 and Extant EVC's in the Bridgewater Bioregion.....	73
Table 24 total area and number of EVC's in the Bridgewater bioregion	74
Table 25 Land Use Glenelg Plains Bioregion.....	76
Table 26 total area of pre 1750 EVC's in the Lower Glenelg Bioregion.....	77
Table 27 Total area of Pre 1750 and Extant EVC' in Merino zone.....	83
Table 28 Overlays impacting on Glenelg	88
Table 29 B1Z Parcels in Glenelg by Location.....	89
Table 30 B1Z parcel area.....	90
Table 31 B1Z Land use by Property Levy Description	91
Table 32 B 1 Property Description by Location.....	93
Table 33 Value of B1Z Building permits 2000-2009	94
Table 34 B1Z Land Budget.....	95
Table 35 Growth Scenarios for B1Z Zone 1%, 2%, 3%.....	95
Table 36 Business Zoning Across S. W. Victoria	96
Table 37 B1Zone Area Compared to Population.....	97
Table 38 Summary of B1 Zone in Portland.....	99
Table 39 B1Z Subdivision permits by year	101
Table 40 B1 Development Areas.....	101
Table 41 B1Z Subdivision Proposals by location.....	104
Table 42 B1 Subdivision Permit Progress through the Glenelg Planning Department	105
Table 43 Progress of B1 Submissions Permits through the Glenelg Planning Process.....	105
Table 44 Parking Provision relative to Retail Floor Space for the CBD of Portland	115
Table 45 Portland B1 Soil Characteristics	116

Table 46 Summary of B1 Zone in Casterton	118
Table 47 Casterton B1 Zone Soil Characteristics	119
Table 48 Summary of B1Z in Heywood	121
Table 49 Heywood B1 Soil characteristics	122
Table 50 Retail Activity Employment	122
Table 51 B4Z Parcels by Rating Code	126
Table 52 B4Z Parcel Area by Location	127
Table 53 B4Z Property Description by Location	128
Table 54 Value of B4Z Building Permits 2000-2009	128
Table 55 B4 Available Land and Demand	129
Table 56 B4 Zone Area Compared to Population	130
Table 57 B4 Zone Portland	131
Table 58 B4Z Subdivisions permits by year	133
Table 59 B4 Development Areas	133
Table 60 B4 Subdivision permit progress through the Glenelg Planning Department	133
Table 61 Portland B4 Soil Characteristics	135
Table 62 Summary of B4 Zone in Casterton	136
Table 63 Casterton B4 Soil Characteristics	137
Table 64 Summary of B4Z in Heywood	138
Table 65 Casterton B4 Soil characteristics	139
Table 66 INZ 1 parcels in Glenelg by location	141
Table 67 INZ1 Parcel Area	141
Table 68 INZ Land Use By Property Levy Description	142
Table 69 Property Description by Location	143
Table 70 Value of B4Z Building Permits 2000-2009	144
Table 71 IN1 Zone Compared to Population For Selected Locations	145
Table 72 Summary of Industrial 1 Zone Portland	146
Table 73 IN1Z Subdivision permits by year	147
Table 74 IN1Z Development Areas	148
Table 75 IN1Z Subdivision Proposals by Location	150
Table 76 Subdivision Permit Process through the Glenelg Planning Department	151
Table 77 Progress of IN1Z Permits through the Glenelg Planning Process	151
Table 78 North Portland IN1Z Soil Characteristics	152
Table 79 IN1 Z Soil Characteristics Middle Section South Portland	153
Table 80 Summary Industrial 1 Zone Heywood	155
Table 81 Heywood IN1 Z Soil Characteristics	156
Table 82 Summary of Industrial 1 Zone Casterton	157
Table 83 Casterton IN1Z Soil Characteristics	158
Table 84 INZ 2 Parcels in Glenelg by Location	160
Table 85 IN 2 Land Use by Property Levy Description	161
Table 86 Building Permits 2000-2009 For Industrial Two Zone	161
Table 87 IN2Z Subdivision permits by year	164
Table 88 IN2 Development Areas	164
Table 89 IN2Z Subdivision Proposals by location	165
Table 90 IN2 Subdivision Permit progress through the Glenelg Planning Department	166
Table 91 North Portland IN2 Soil Map	167

Table 92 Soil characteristics for Portland Smelter Area.....	168
Table 93 Soil Characteristics for IN2Z in West Portland.....	169
Table 94 IN3 Zone by Location.....	170
Table 95 IN3 Land Use by Property Levy Description.....	170
Table 96 Summary Table of Ind3 Zoning in Portland.....	172
Table 97 IN3Z Subdivision permits by year.....	173
Table 98 B1 Development Areas.....	173
Table 99 Subdivision Activity in Portland IN3 Zone.....	174
Table 100 Decisions by Year IN3Z Portland.....	175
Table 101 IN3 Portland Soil Characteristics.....	175
Table 102 Summary of IND3 Zone in Heywood.....	176
Table 103 Heywood IN3 Soil Characteristics.....	177

Maps

Map 1 Glenelg Shire	18
Map 2 Glenelg Land Uses identified by Victorian Department of Primary Industry.....	30
Map 3 Grazing Modified Pastures	33
Map 4 Roads	34
Map 5 Other Conserved Areas.....	35
Map 6 National Parks.....	36
Map 7 Hardwood Production.....	37
Map 8 Grazing Natural Vegetation.....	38
Map 9 Production Forestry	39
Map 10 Irrigated Modified Pastures	40
Map 11 Remnant Native Cover	41
Map 12-Yearly Rainfall in Casterton.....	46
Map 13 Yearly Rainfall in Heywood.....	46
Map 14 Yearly Rainfall in Portland.....	47
Map 15 Yearly Rainfall in Nelson.....	47
Map 16 Climate and Rainfall data for Casterton	48
Map 17 Climate and Rainfall data for Heywood.....	49
Map 18 Climate and Rainfall data for Portland.....	49
Map 19 Casterton 10 Year Flooding Pattern	51
Map 20 Casterton 100 Year Flooding Pattern	51
Map 21 Heywood 10 Year Flooding Pattern	52
Map 22 Heywood 100 Year Flooding Pattern	52
Map 23 Heywood Combined Flood Map showing 10 and 100 Year Floods	53
Map 24 Portland 10 Year Flooding Pattern	53
Map 25 Portland 100 Year Flooding Pattern	54
Map 26 Composite Map of Wind Erosion in Glenelg.....	54
Map 27 Glenelg Salinity Map.....	55
Map 28 Areas of Mass Movement in Glenelg.....	55
Map 29 Portland Physical Development Constraints	61
Map 30 Portland Drainage Assessments.....	63
Map 31 Portland Sewer Services Assessment	65
Map 32 Heywood Reticulated Sewer Network	66
Map 33 Heywood Reticulated Water Network.....	67
Map 34 Casterton Reticulated Sewer Network.....	68
Map 35 Casterton Reticulated Water Network.....	69
Map 36 Glenelg's Biodiversity Regions	70
Map 37 Bridgewater Biodiversity Region	71
Map 38 Glenelg Bio Region	75
Map 39 Dundas Table Bioregion.....	79
Map 40 Merino Zone of the Dundas Tableland Bioregion.....	80
Map 41 B1Z Parcels with 5 KM of Portland	98
Map 42 B1 Subdivision Permits Portland.....	102

Map 43 B1 Subdivision Permits Casterton.....	102
Map 44 Portland CBD Parking Study Area.....	106
Map 45 Pedestrian and Vehicular Linkages in Portland CBD	107
Map 46 Block 1 Portland CBD Parking Study	108
Map 47 Block 2 Portland CBD Parking Study	109
Map 48 Portland CBD Parking Study Block 3	110
Map 49 Portland CBD Parking Study Block 4	111
Map 50 Portland CBD Parking Study Block 5	112
Map 51 Portland CBD Parking Study Block 6	113
Map 52 Portland CBD Parking Study Block 7	114
Map 53 B1 Z Parcels within 5 KM of Casterton	118
Map 54 B1Z Parcels within 5 Km of Heywood	120
Map 55 B1Z Parcels with 5 KM of Portland	131
Map 56 B4 Subdivision Permits Portland.....	134
Map 57 B4 Z Parcels within 5 KM of Casterton	136
Map 58 B4Z Parcels within 5 Km of Heywood	138
Map 59 Industrial 1 Zone Portland.....	146
Map 60 IN1 Subdivision Permits Portland.....	148
Map 61 IN1Z Subdivision Permits Casterton.....	149
Map 62 Northern Portland Soil Map for Industrial 1 Zone	152
Map 63 Soil Map for the Middle Section of the Industrial 1 Zone of Portland.....	153
Map 64 Soil Map for the Southern Section of the Industrial 1 Zone of Portland.....	154
Map 65 Heywood IN1Z Industrial Land	155
Map 66 Summary of Industrial 1 Zone in Casterton	157
Map 67 Industrial 2 Zone Portland.....	163
Map 68 IN2 Subdivision Permits Portland.....	165
Map 69 Northern Portland Soil Map for Industrial 2 Zone	166
Map 70 Soil Map for Portland Smelter Area.....	167
Map 71 IN2 Zone Western Portland Area Soil Map for IN2 Zone	168
Map 72 Ind3 Zone in Portland.....	172
Map 73 IN3 Subdivision Permits Portland.....	174
Map 74 IN3 Zone Heywood	176

Executive Summary

Volume1

1.1 Introduction

Section 1 of Volume One, of the Glenelg Sustainable Land Use Study provides an overview of Glenelg Shire highlighting the demographic and physical land / soil characteristics, climate conditions, the natural physical constraints which impact on the shire and the biodiversity of Glenelg Shire.

Section Two of Volume One introduces the Victorian Planning Framework and its role in the daily operational statutory and strategic planning of Glenelg. This discussion provides the platform for a through analysis of each of the current Glenelg planning zones. The analysis examines current land use; physical impediments; land fragmentation; subdivision and building permit activity; forecast demand and supply of land; soil characteristics and challenges and options for each respective zone.

Volume one, contains the analysis on Glenelg's commercial and industrial zones (i.e. B1, B4, IN1, IN2, and IN 3). Volume two of the study deals with the residential zones (i.e. Residential1, Township, Low Density Residential, Rural Conservation, Farm Zone and Rural Living).

A brief synopsis relating to the finding for each zone listed in Volume one is listed below.

1.2 Zone Analysis

1.2.1 Business 1 Zone

Portland, Casterton and Heywood each have B1Z zoning

Challenges:

1. The future demography of Glenelg – the aging population
2. Physical constraints such as flooding, sink holes and physical infrastructure in the three primary centers (Portland, Casterton and Heywood)
3. Land availability and where to expand the zone in Portland
4. Heritage Impacts on the B4 Zone in Portland
5. Parking in Portland
6. Land availability and where to expand the zone in Casterton
7. Land availability and where to expand the zone in Heywood
8. Streetscapes and appearance of the three major retail areas (Portland, Casterton and Heywood) in the shire- 3 majors- UDF

9. Non-commercial uses impacting of the B1 zone in the Portland, Casterton and Heywood.
10. Retail leakage to surrounding areas such as Hamilton, Warrnambool and Mount Gambier
11. No design framework
12. No catalyst for change
13. No signage control
14. No respect for heritage

Options

1. Design framework for Business 1 areas in the three towns
2. Rezone some of the B4 area into B1 land
3. Develop a advertising signage policy for the zone
4. Integrate the heritage features and assets into a proposed Urban Design Framework

1.2.2 Business 4 Zone

The B4 Zone may hold the future for retailing in Glenelg, Portland, Casterton and Heywood each have B4Z zoning

Challenges

1. Is zone relevant? (what is the demand for box stores) Can the current B4 zone be converted to B1 zone?
2. Residential contamination
3. Limited land size
4. Possible flooding, sinkholes, fragmentation
5. Something population demand for goods
6. Stagnant growth

Options

1. Use or rezone suitable B4 in B1

1.2.3 Industrial Zones (IN1, IN2, IN3)

Glenelg Shire has substantial holdings of industrial land located primarily in greater Portland, Heywood and Casterton.

Challenges

1. Large allotments or portions of the industrial land area in Portland are constrained by residential development inside and outside the zone.

2. Industrial Land is constrained by physical impediments such as sink holes and flooding issues.
3. Lack of serviced industrial land ready for market
4. Perceived Lack of demand for current supply of industrial land

Options

1. Relocate remaining industrial areas out of heavily developed residential areas /enclaves which have developed in industrial zoned land.
2. Develop site specific industrial park for low and medium intensive industry and manufacturing
3. Enforce the industrial buffer requirements
4. Enforce the policy of non residential development in industrial zones
5. Specify the Heywood to Portland Industrial development corridor as a major industrial development area.

2 Preamble

The Glenelg Strategic Futures Plan had as one of its recommendations to undertake a sustainable settlement / rural zones review to determine the appropriate settlement pattern in Glenelg Shire.

Glenelg Shire has not undertaken a rigorous review of its settlement patterns, commercial, industrial or farm (rural) zones or demand for residential, agricultural or commercial land since the Shire was formed in 1996. The current suite of rural zones in Glenelg was the result of a direct translation of the former rural zones in 2006. In Victoria, planning authorities are required to undertake a review of their planning schemes every four years to ensure that their respective planning scheme is current and adequately reflects the Shire it represents.

The Glenelg Sustainable Settlement Study has a series of goals, objectives and targeted outcomes. The goals, objectives and outcomes of the project are:

1. To provide a detailed analysis of the residential patterns, commercial, industrial and agricultural potential which currently resides in Glenelg Shire
2. To have a sustainable settlement policy that will provide the basis for the long term policy direction for residential development in Glenelg.
3. To have a sustainable agricultural sector that is a major economic influence for the future well being of Glenelg Shire
4. To provide the best statutory planning platform for sustainable settlement and agriculture in its many and varied forms in Glenelg Shire.
5. To determine the role of the current residential, industrial, commercial and agricultural (rural) zones in Glenelg. Do these zones cater for the current needs of the citizens in Glenelg Shire?
6. To determine if a reallocation or addition to residential, commercial, industrial or agricultural (rural) zones is required to meet present and future needs of citizens.
7. To align the sustainable settlement review to take into consideration climate change, technology, demographic, social / economic factors and current state government policy relating to land management

The study has a management structure that includes an executive steering committee. The committee is comprised of state agencies (Department of Planning and Community Development (DCPD); Country Fire Authority (CFA); Department of Primary Industry (DPI); Department of Sustainability and Environment (DSE) and the Glenelg Hopkins Catchment Management Authority (GHCMA)). These agencies are currently responsible for various legislative responsibilities or have an interest in the future development patterns of Glenelg Shire.

The role of executive steering committee is to comment on the progress and robustness of the review. The steering committee is scheduled to meet either 3 or 4 times during the life of the project. In addition to these meetings monthly updates on the study will be circulated to the steering committee.

To assist the steering committee three peer reviews will be undertaken. The peer review process will be undertaken by a private consultant. The peer review process will be comprised of three separate reviews (1 prior to commencement of the study, 1 at the mid point and one at the completion of the project and public consultation phase of the project).

The first peer review will review volume one of the Glenelg Sustainable Settlement Study examining the study's proposed methodology and data sources. The initial review will assess the methodology and suggest where possible improvements can be made.

The second peer review will be conducted at the mid point of the study to provide an audit and review of the work undertaken and completed to ensure that the review will meet the stated goals and objectives of the project.

The third review will be undertaken at the completion of the review and the public consultation phase of the Sustainable Land Use Study.

Glenelg Shire through the Community Engagement Strategy and Glenelg Council Plan has committed itself to ongoing community and stakeholder consultation through various methods.

The 2009- 2013 Council Plan states the council is committed to:

“Review and implement continuous improvements to statutory planning to ensure efficient and effective processes, statutory compliance and quality levels of customer engagement and service” P 17 (Glenelg Council Plan 2009-2013)

With respect to planning issues the Shire utilizes methods such as: meetings with individuals, public forums, discussions papers, questionnaires, service brochures / pamphlets, community news outlets, issues based workshops press releases and public notices to engage and communicate with the community regarding planning issues.

This review will provide a final report on the study summarizing the project and assessing how the project complied with meeting prescribed goals and objectives. In addition the consultant will provide a final endorsement of the study.

Section 1 of Volume 1 of the study is entitled Introduction to Glenelg. This section outlines basic information on the Shire's location; demographics (population and employment); industry characteristics; land characteristics and land use activities and current planning zones which operate in the Shire.

Section 2 of Volume 1 is entitled Planning Zone Analysis and describes current status and projected growth pattern for each zone in detail giving information on:

1. Number of parcels
2. Parcel area
3. Land use activity
4. Number of parcels within a 5 and 10- km radius from a major Shire center
5. Fire prone level for each zone

6. Soil characteristics per zone including acidity; dispersive behavior; landslides; nutrient decline; salinity; water logging; water erosion; wind erosion; pH; soil impeding depth; soil drainage; topsoil characteristics and total topsoil depth
7. Suitability for Agricultural activities in the relevant zone.
8. Nominated agricultural activities if the parcel is suitable for agricultural activity.
9. Land use impediments such as flooding, infrastructure, waste water management and sinkholes locations are identified in each planning zone
10. A 10 year building and planning permit summary for each zone highlights development activity and history
11. A current land budget for each zone showing the current stock of available vacant land per zoning category.
12. An economic and population forecast with growth rates of 0, 1 and 3 percent per annum for a period of 10 and 20 years applied to the land budget to determine what additional land would need to be specifically zoned for each zone classification.
13. The level of current zone fragmentation
14. The level of zone contamination by non prescribed uses or activities
15. Summary for each zone and its future requirements.

Section 1 Introduction to Glenelg

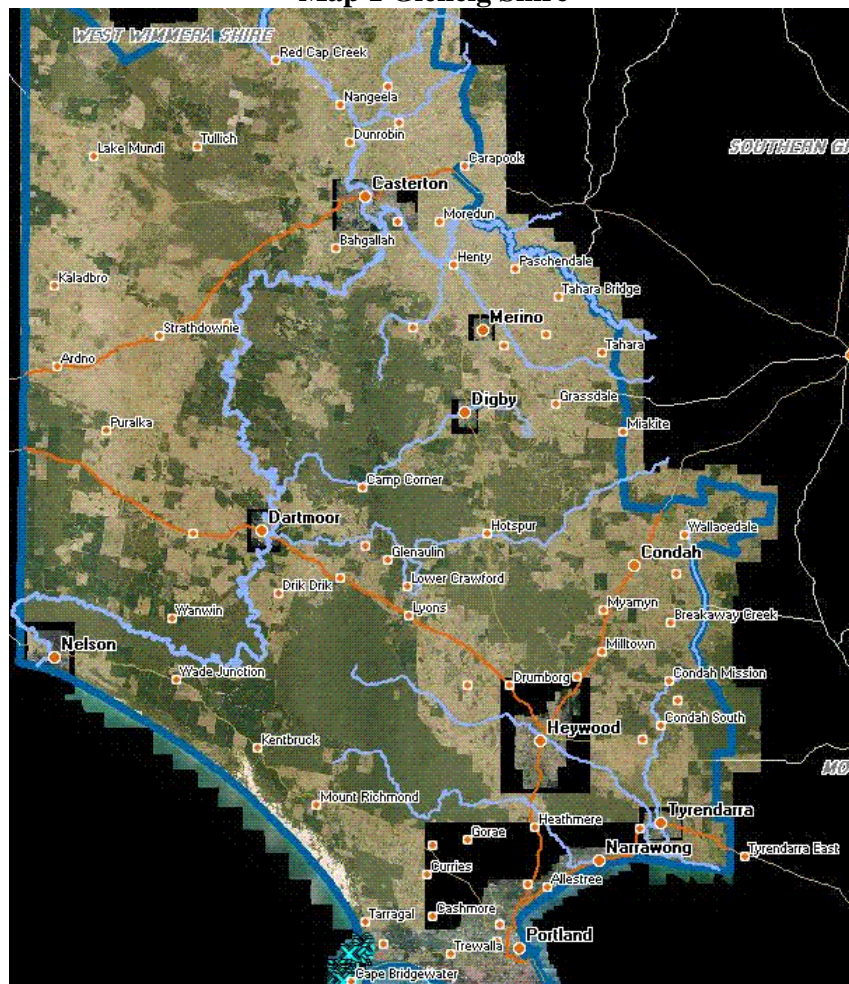
3 Introduction

Glenelg Shire is located on the south coast of south western Victoria, about 360 kilometers west from Melbourne. Glenelg Shire is bounded by West Wimmera Shire in the north, Southern Grampians and Moyne Shire in the east, the South Australian border in the west and the Southern Ocean in the south.

Glenelg Shire is predominately a rural Shire with the main residential areas in Casterton, Heywood, Nelson, Digby, Dartmoor, Merino, Cape Bridgewater, Tyrendarra, Narrawong and the principle town of Portland.

The Shire encompasses a total land area of 6,200 square kilometers including, national parks, pine plantations and coastline. Much of the rural area is used for plantation timber, farming, grazing and dairying.

Map 1 Glenelg Shire



Source: Glenelg Shire

4 Demographics of Glenelg Shire

Data from the 2006 ABS Census indicates that Glenelg Shire has:

- An age profile characterized by higher proportions of children and older persons;
- More than double the average proportion of Indigenous residents compared to Victoria;
- Lower than average full-time employment compared to the State average;
- Lower than average levels of labour force participation;
- A higher than average unemployment than State and Western SD averages;
- Slightly higher than average proportion of couple families without children than the state average;
- Slightly lower than average proportions of single parent households;
- Higher than average levels of car ownership compared to the average;
- Average weekly incomes that are 17% lower than the State average;
- Average monthly housing loans that are significantly lower (-30%) than the State average;
- A lower average weekly rent payment than the State average (-39%);
- A lower than average proportion of persons with non-school qualification;
- Less than half the average proportion of persons with a Bachelors degree or higher in comparison to the average;
- Higher than average proportion of persons with a certificate qualification;
- Higher than average proportions of persons occupied as managers & administrators (15.6%), tradespersons and related workers (13.2%), intermediate production & transport workers (13.6%), labourers and related workers (12.4%); and
- Most dominant industries of the workforce are agriculture, forestry and fishing, manufacturing, and retail trade.

A summary of key statistics and a demographic profile of Glenelg Shire are provided in Table 1. It displays 2001 and 2006 data as both absolute numbers and percentages (where applicable), along with the change in number between these years.

Table 1 Demographic Profile of Glenelg

Key statistics(summary statistics) Glenelg Shire							
Enumerated data	2006			2001			Change 2001 to 2006
	number	%	Great South Coast %	number	%	Great South Coast %	
Enumerated population, including overseas visitors							
Total population (a)	19,362	100.0	100.0	19,288	100.0	100.0	74
Males (a)	9,745	50.3	49.5	9,772	50.7	49.7	-27
Females (a)	9,617	49.7	50.5	9,516	49.3	50.3	101
Overseas visitors	68	0.4	0.4	39	0.2	0.5	29
Enumerated population, excluding overseas visitors							
Total population (b)	19,296	100.0	100.0	19,249	100.0	100.0	47
Males (b)	9,720	50.4	49.6	9,745	50.6	49.7	-25
Females (b)	9,576	49.6	50.4	9,504	49.4	50.3	72
Population characteristics							
Indigenous population	360	1.9	1.1	226	1.2	0.8	134
Australian born	16,848	87.3	88.1	16,911	87.9	89.1	-63
Overseas born	1,371	7.1	6.4	1,317	6.8	6.0	54
Australian citizens	17,805	92.3	92.5	17,947	93.2	94.0	-142
Australian citizens aged 18+	13,238	68.6	68.3	12,966	67.4	68.3	272
Institutional population	545	2.8	3.4	503	2.6	3.2	42
Age structure							
Infants 0 to 4 years	1,128	5.8	6.1	1,328	6.9	6.9	-200
Children 5 to 17 years	3,775	19.6	19.7	3,988	20.7	20.5	-213
Adults 18 to 64 years	11,413	59.2	58.5	11,206	58.2	57.7	207
Mature adults 65 to 84 years	2,584	13.4	13.6	2,408	12.5	13.1	176
Senior citizens 85 years and over	392	2.0	2.1	320	1.7	1.8	72
Households and dwellings							
Owned	3,192	34.6	35.1	3,723	41.9	42.5	-531
Purchasing	2,486	26.9	24.6	1,987	22.4	20.3	499
Renting	1,609	17.4	19.2	1,442	16.2	16.5	167
Households (occupied private dwellings)	7,816	--	--	7,635	--	--	181
Persons counted in households	18,815	--	--	18,785	--	--	30
Average household size (persons)	2.41	--	--	2.46	--	--	-0.05
Total Dwellings	9,235	100.0	100.0	8,885	100.0	100.0	350

Source: Australian Bureau of Statistics, Census of Population and Housing, 2006, 2001, 1996, and 1991.

The population is forecast in accordance with current trends to decline from 22,039 to 19,194 over the period 1991 to 2030, a decrease of 2,845 persons or a fall of 12.9 %. The age break for Glenelg is highlighted in Table 2.

Table 2 Population Age Breakdown for Glenelg

Age structure age group (years)	Glenelg Shire		2006		2001		Change 2001 to 2006
	number	%	Great South Coast %	number	%	Great South Coast %	
0 to 4	1,128	5.8	6.1	1,328	6.9	6.9	-200
5 to 11	1,986	10.3	10.2	2,220	11.5	11.2	-234
12 to 17	1,789	9.3	9.5	1,768	9.2	9.2	21
18 to 24	1,255	6.5	7.5	1,168	6.1	7.3	87
25 to 34	2,040	10.6	10.6	2,353	12.2	11.9	-313
35 to 49	4,354	22.6	21.5	4,490	23.3	22.0	-136
50 to 59	2,788	14.5	13.8	2,288	11.9	12.0	500
60 to 69	1,820	9.4	9.3	1,626	8.4	8.5	194
70 to 84	1,740	9.0	9.4	1,689	8.8	9.2	51
85 and over	392	2.0	2.1	320	1.7	1.8	72

Source: Australian Bureau of Statistics

The largest changes in age structure between the 2001 and 2006 census were in the following age groups

- 50 to 59 (+500 persons) ; 25 to 34 (-313 persons)
- 5 to 11 (-234 persons) 0 to 4 (-200 persons)

4.1 Population Movements

Retaining younger people in the community is a significant issue for the Shire. Between 2001 and 2006, 767 persons aged between 15 and 24 moved out of the Shire to pursue higher education and other opportunities compared to only 331 persons in this age bracket who migrated into the area, for a net 15-24 loss of 436 persons. The most common Local Government Areas that people from Glenelg moved to were Greater Geelong, Warrnambool and Mt Gambier.

Table 3 Glenelg population Movements 2001 - 2006

Age Group	Movements In	Movements out	Net Movements
5 to 14	395	398	-3
15 to 24	331	767	-436
25 to 34	515	423	92
35 to 54	762	610	152
55 to 64	302	231	71
65 +	268	222	46
Total	2,573	2,651	-78

Source: Australian Bureau of Statistics

Statistics relating to labour force participation show Glenelg has a similar levels to other Shires in the south west Victoria. The current rate is approximately 62%

Table 4Glenelg Shire Employment Status

Employment status (persons aged 15 years and over)	Glenelg Shire			Great South Coast			Change 2001 to 2006
	2006		2001	2001		2006	
Enumerated data	number	%	number	%	number	%	
Employed full time	5,333	57.0	5,149	57.8	5,149	60.3	184
Employed part time	3,187	33.8	2,746	30.8	2,746	30.5	421
Employed not stated	266	2.8	302	3.4	302	3.3	-36
Total employed	8,786	93.7	8,197	92.1	8,197	94.1	589
Total unemployed	592	6.3	705	7.9	705	5.9	-113
Total labour force	9,358	100.0	8,902	100.0	8,902	100.0	456
Total in labour force	9,358	61.3	8,902	60.1	8,902	60.6	456
Total not in labour force	5,193	34.0	5,300	35.8	5,300	35.4	-107
Not stated	726	4.8	622	4.2	622	4.0	104
Total	15,277	100.0	14,824	100.0	14,824	100.0	453

Source: Australian Bureau of Statistics

4.2 Labour Force Participation

Males were far more likely to be in full time employment than females. A further 9.6% of males were employed part time along with 24.5 % of females.

The Northern area has the highest proportion of persons not in the labour force (40.5%) followed by Portland (34.6%) and Heywood (30.9).

In 2006 there were 601 persons unemployed in Glenelg Shire representing an unemployment rate of 6.3% (5.1% in Heywood and 7.7% in Portland).

In 2006 there were 2756 person who were employed part time in the labour force (29%0. (27.5% in Heywood, (27.5%) North and (30.5%) in Portland.

Table 5 Glenelg Labour Force Participation

Labour Force	Glenelg	% of persons in labour force	Heywood	% of persons in labour force	North	% of persons in labour force	Portland	% of persons in labour force
Employed Full Time	5316	56	1801	58.5	869	57.8	2648	53.9
Employed Part Time	2756	29	847	27.5	459	30.5	1454	29.6
Employed & away from work	541	5.7	170	5.5	64	4.3	309	6.3
Employed hours not stated	283	3	120	3.9	34	2.3	125	2.5
Unemployed	601	6.3	142	4.6	77	5.1	379	7.7
		% of total persons 15+		% of total persons 15+		% of total persons 15+		% of total persons 15+
Not in the labour force	5442	34.6	1479	31	1083	40.4	2878	34.8
Total labour force (includes employed and unemployed)	9497	60.4	3080	64.5	1503	56.1	4915	59.5
Total persons 15 years and over+	15720		4774		2678		8266	

Source: Australian Bureau of Statistics

4.3 Employment in the Shire

There are number of key sectors in Glenelg, including the Port of Portland, the Portland Aluminium smelter, renewable energy timber production and processing, commercial fishing, agribusiness and tourism.

There were a total of 7944 jobs located in Glenelg and 8894 residents who were in employment. The major concentrations of jobs were in manufacturing 1607 (20%), agriculture 1194 (15%), retail 900 (11%), health care and social assistance 859 (11%) and education and training 412 (6%). Males held 4401 jobs or 55.4 % and Females held 3543 jobs or 44.6%.

The industries employing male and females were substantially different. Males were mainly employed in goods production (58.3%) or goods related industries (10.5%) with the major sectors being manufacturing 1354 jobs; agriculture, forestry and fishing 772 jobs; and transport and logistics 347. Females were mainly employed in personal services 2290 jobs or 64.9% with the major sectors being retail 900 jobs; health care and social assistance 859 jobs; accommodation and food services 473 jobs and education and training 512 jobs.

There was some commuting to jobs in the regions. Of the 7941 jobs in the Shire, 95% are filled by Glenelg Shire residents and 5% by persons travelling into the region. Around 15% of Glenelg Shire residents commute outside of the Shire for employment. Of 8903 employed persons living within Glenelg, 1367 commuted to jobs in locations outside of the Shire.

Table 6 Industries in Glenelg and their respective employment numbers

Industry, 2006 ANZSIC(employed persons)	Glenelg Shire		
	2006		Great South Coast
Enumerated data	number	%	%
Agriculture, Forestry & Fishing	1,289	14.5	18.8
Mining	31	0.4	0.7
Manufacturing	1,644	18.8	10.7
Electricity, Gas, Water and Waste Services	113	1.3	1.0
Construction	559	6.4	7.5
Retail Trade	917	10.5	11.5
Wholesale Trade	239	2.7	3.5
Accommodation and Food Services	498	5.7	6.5
Transport, Postal and Warehousing	480	5.2	4.0
Information Media and Telecommunications	48	0.5	0.9
Financial and Insurance Services	118	1.3	1.6
Rental, Hiring and Real Estate Services	84	1.0	0.9
Professional, Scientific and Technical Services	224	2.6	2.9
Administrative and Support Services	172	2.0	2.4
Public Administration and Safety	341	3.9	4.7
Education and Training	520	5.9	6.9
Health Care and Social Assistance	946	10.8	11.2
Arts and Recreation Services	70	0.8	0.9
Other Services	272	3.1	3.1
Inadequately described or Not stated	245	2.8	2.5
Total	8,768	100.0	100.0

Source: Australian Bureau of Statistics

4.4 Employment Trends

There has been limited growth in the number of jobs in the region between 2001 and 2006. In this period total jobs increased by only 335 (males 45 and females 290). There has been a major increase in jobs in Portland and a major decline occurring in the Heywood area.

Jobs in Portland increased by 840 or 24% over the period, with these jobs being concentrated in manufacturing (+242) health and social assistance (+168) and accommodation, cafes and restaurants (+158).

Jobs in the Heywood area declined by 496 or 25% with the major falls being in manufacturing (-74) retail trade (-97) agriculture, forestry and fishing (-68) and accommodation, cafes and restaurants (-41)

Jobs in the north of the Shire declined by 9, with the major fall being in retail (-45) and growth in several sectors including agriculture, forestry and fishing (+26) and transport and logistics (+12)

4.5 Income Levels

The region has lower income levels relative to Australia as a whole. An analysis of ABS census data on individual gross incomes in the Glenelg shows that:

Glenelg Shire has a median weekly gross income of \$405, compared with \$466 for Australia as a whole. Income data for Portland (Median income and the distribution of income) shows that it more closely mirrors that of the aggregate data for the Shire.

The northern area of the Shire had the highest proportion of lower income persons and the lowest proportion of higher income persons compared with other areas in the Shire. A total of 50 % of individuals in northern areas reported a gross weekly income of \$400 or less while only 9% reported incomes of \$1000 or greater. The median weekly income for the northern area was \$441.

The lower incomes for the Northern areas of Glenelg can be attributed in part to the high proportion (45%) of persons aged 50 and over which translates into an overall lower participation in the labour force.

In Heywood 43% of persons reported gross weekly incomes of \$400 or below while 16% of people from this area reported incomes of \$1000 or greater. The median weekly individual income for the area was \$441.

Table 7 Glenelg Income Levels

Measure	Glenelg	Portland	Heywood	North
Median individual income	405	402	441	370
Median Family Income	1074	1067	1136	902
Median Household Income	831	833	985	644

Source: Australian Bureau of Statistics

4.6 Industry Structure

ABS data shows that there was 2091 business in the Shire. Of these 1221 were non employing businesses. The data shows that there are a small number of large employers and a large number of small businesses. The most frequently reported business size has 1-4 employees followed by the 5 -19 segment. On a turnover basis, few businesses had turnovers over \$ 1 Million per year, with almost half having turnovers of less than \$100,000.

Table 8 Business by Industry by Employment Size 2006

Industry	Non Employing	1-4	5-19	20- 49	50- 99	100- 199	200+	Total
Agriculture forestry & fishing	3600	231	120	18	3	0	0	972
Mining	0	0	0	0	0	0	0	0
Manufacturing	15	15	21	9	0	0	0	60
Construction	96	63	24	3	0	0	0	183
Wholesale Trade	45	15	9	12	0	0	0	72
Retail Trade	69	72	33	3	0	0	0	186
Accommodation Cafes, restaurants	30	21	9	6	0	0	0	63
Transport & Storage	51	21	0	0	0	0	0	78
Communication Services	3	9	0	0	0	0	0	12
Finance & insurance	57	12	6	0	0	0	0	75
Property & Business Services	210	21	39	0	0	0	0	270
Education	0	0	0	0	0	0	0	0
Health & community services	12	24	18	0	0	0	0	54
Cultural & recreational Services	15	6	0	0	3	0	0	24
Personal & other Services	18	9	12	3	0	0	0	42
Total	1221	519	291	54	6	0	0	2091

Source: Australian Bureau of Statistics

Table 9 Business by industry by turnover

Industry	0 to less than \$25 K	\$25 K to less than \$50 K	\$50 K to less than \$75K	\$75 K to less than \$100 K	\$100 K to less than \$150K	\$150K to less than \$200K	\$200K to less than \$500K	\$500K to less than \$1 M	\$1 M to less than \$2 M	\$2 M to less than \$5 M	\$5 M to less than \$10M	\$10 M to less than \$20M	\$20M to less than \$50M	total
Agriculture forestry & fishing	183	114	126	63	102	84	189	87	12	12	0	0	0	972
Mining	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manufacturing	6	6	3	0	0	9	15	6	3	9	3	0	0	60
Construction	24	15	21	15	30	12	36	24	6	0	0	0	0	183
Wholesale Trade	3	6	9	9	9	3	12	9	12	0	0	0	0	72
Retail Trade	24	21	12	18	15	9	33	30	15	6	3	0	0	186
Accommodation Cafes, restaurants	3	0	12	12	12	3	18	3	0	0	0	0	0	63
Transport & Storage	9	9	3	6	24	6	12	3	3	0	0	3	0	78
Communication Services	0	0	6	3	0	0	0	3	0	0	0	0	0	12
Finance & insurance	27	12	12	0	3	0	6	3	9	3	0	0	0	75

Source Australian Bureau of Statistics

Business by industry by turnover

Industry	0 to less than \$25 K	\$25 K to less than \$50 K	\$50 K to less than \$75K	\$75 K to less than \$100 K	\$100 k to less than \$150K	\$150K to less than \$200\$	\$200K to less than \$500K	\$500K to less than \$1M	\$1 M to less than \$2M	\$2 m to less than \$5 M	\$5 M to less than 10M	\$10 M to less than \$20m	\$20M to less than \$50M	Total
Property & Business Services	75	42	30	21	30	12	45	6	6	0	0	0	3	270
Education	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Health & community services	3	0	0	3	6	9	21	6	6	0	0	0	0	54
Cultural & recreational Services	3	0	3	6	6	0	6	0	0	0	0	0	0	24
Personal & other Services	9	0	3	0	9	9	9	0	3	0	0	0	0	42
Total	369	231	237	153	246	156	405	177	75	30	6	3	3	2091

Source Australian Bureau of Statistics

5 Land Characteristics of Glenelg

Approximately 81 % of Glenelg has been developed for agricultural use. Approximately 2% of the area is comprised of pine forest, while 16% is native forest and less than 1% is used for urban and industrial development. The main agricultural land uses are dominated by dryland pasture. Glenelg Shire's total land mass is 784,047 hectares. The ten largest land use activities by area are shown in Table 10. The activities represent 94.4 % of the total land mass of the Shire.

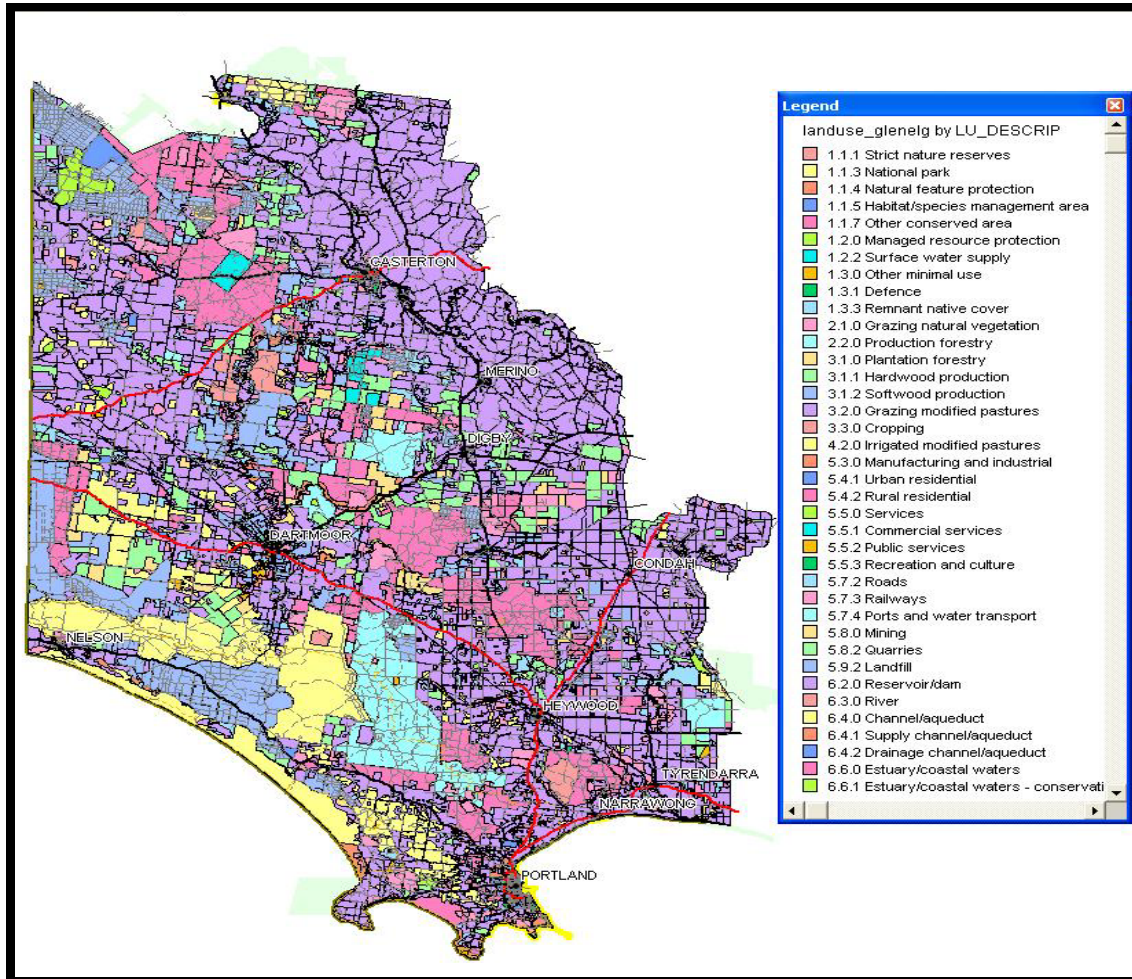
Table 10 Glenelg 10 largest land use activities

Activity	Area	% of total Shire area
Grazing modified pastures	304058	38.781%
Roads	123831.7	15.794%
Other conserved area	71976.18	9.180%
Softwood production	62483.3	7.969%
National park	46406.3	5.919%
Hardwood production	33884.25	4.322%
Grazing natural vegetation	29908.29	3.815%
Production forestry	26989.22	3.442%
Irrigated modified pastures	21099.66	2.691%
Remnant native cover	19259	2.456%
Total	739895.8	94.369%

Source: Victorian Department of Primary Industry

A series of maps have been produced to highlight various land use activities across the Shire. The maps are Total Land Use (Map 2); Grazing Modified Pastures (Map 3); Roads (Map 4); Other Conserved Areas (Map 5); National Parks (Map 6); Hardwood Production (Map 7); Grazing Natural Vegetation (Map 8); Production Forestry (Map 9) Irrigated Modified Pastures (Map 10) and Remnant Native cover (Map 11).

Map 2 Glenelg Land Uses identified by Victorian Department of Primary Industry



Source: Department of Primary Industry

The remaining 27 activities with their respective areas are shown on the following page.

Table 11 The remaining 27 Land use activities in Glenelg by area

Activity	Area	% of total Shire area
Plantation forestry	11799.05	1.505%
Strict nature reserves	6489.831	0.828%
Other minimal use	5130.748	0.654%
Natural feature protection	4039.962	0.515%
Managed resource protection	3936.427	0.502%
Habitat/species management area	3087.513	0.394%
Surface water supply	3028.988	0.386%
Urban residential	1382.542	0.176%
Cropping	1176.145	0.150%
Rural residential	1134.686	0.145%
Manufacturing and industrial	860.6916	0.001%
Railways	537.1415	0.069%
Quarries	534.2444	0.068%
Recreation and culture	447.7469	0.057%
Public services	227.8223	0.029%
Services	88.29608	0.011%
Commercial services	73.08212	0.009%
Landfill	33.6491	0.004%
Ports and water transport	28.91692	0.004%
Drainage channel/aqueduct	26.00862	0.003%
Mining	24.38663	0.003%
River	19.85656	0.003%
Channel/aqueduct	19.74119	0.003%
Estuary/coastal waters - conservation	9.63031	0.001%
Reservoir/dam	9.10812	0.001%
Supply channel/aqueduct	4.42276	0.001%
Defence	1.31572	0.000%

Source: Victorian Department of Primary Industry

5.1 Agriculture Forestry and Mineral Extraction Activities in Glenelg

Glenelg is one of the major forestry and agricultural regions in Victoria. Table 12 shows the area and number of parcels involved in forestry, agriculture and mineral extraction activities in Glenelg.

Table 12 Agriculture, Forestry, Quarry Activity in Glenelg

Activity	Hectares	Number of Parcels
Forestry		
Softwood	62483.3	297
Production Forestry	26989.22	26
Plantation forestry	11799.05	148
Hardwood	33884.25	245
Total forestry	135155.8	716
Agriculture		
Cropping	1176	54
Natural	29908	788
Modified Grazing	304058	2388
Controlled Irrigation	21099	279
Total Agriculture	356242	3459
Total Agriculture and Forestry	491397	4178
Mineral Extraction		
Quarrying		
Quarry	534.22	30
Other mineral Uses	5130	519
Total	5664	546

Source Victorian Department of Primary Industry

5.2 Forestry

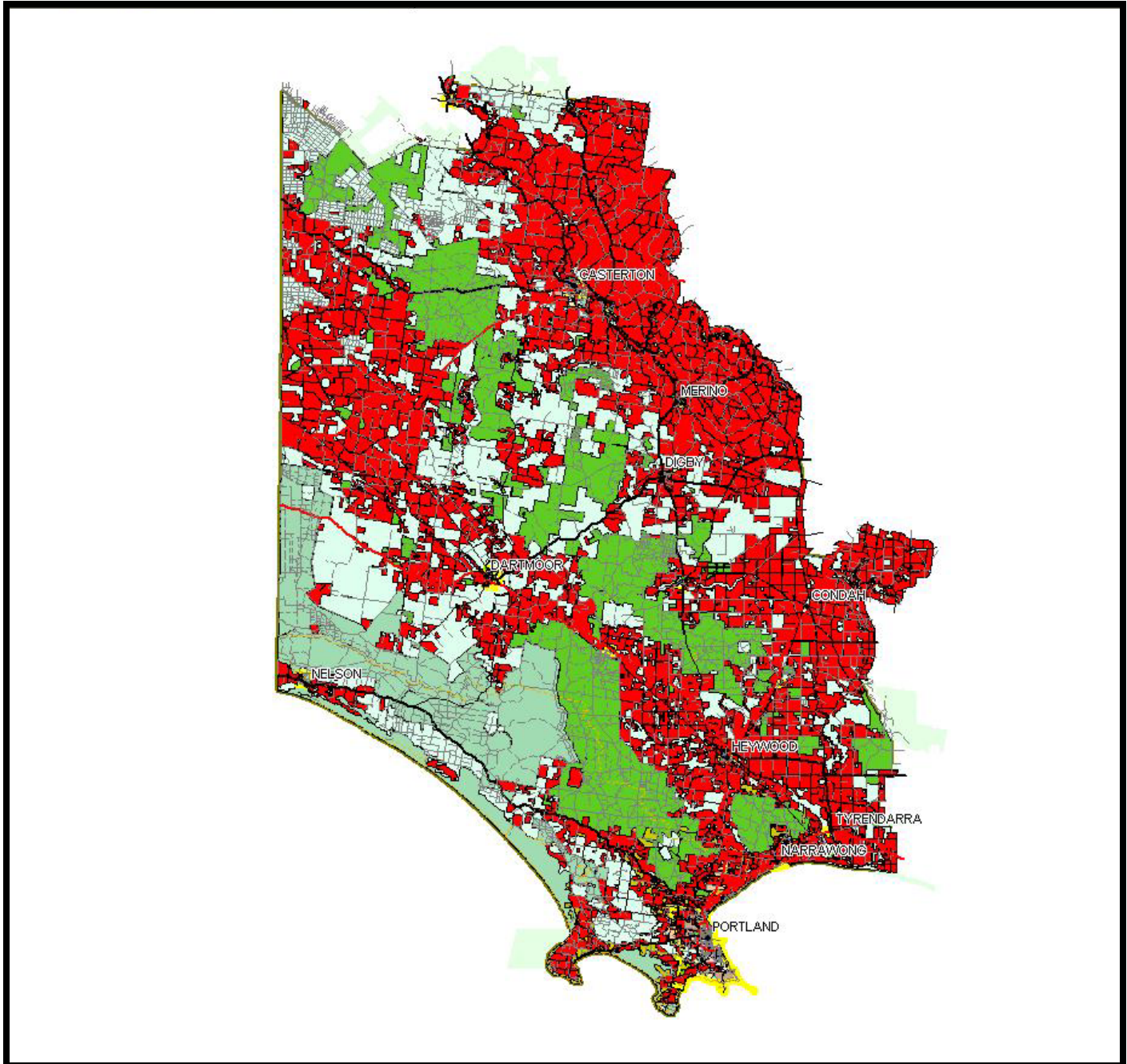
A major driver for the Shire is the forthcoming Blue Gum harvesting phase. It is considered that this industry has considerable potential to mature and develop. The industry will provide economic development and employment opportunities in many of the towns around the Shire. Forestry represents 135,155 HA or (17.2%) of the total 784,047 HA which comprise Glenelg Shire.

5.3 Agriculture

Agriculture plays a major role in the economy of Glenelg Shire. As indicated in the Glenelg Strategic Futures Plan Glenelg is of state-wide importance in terms of its arable land and good rainfall, most of the Shire being in the top category for agricultural productivity.

Agriculture continues to play a significant role in the region despite the expansion of forestry over the last couple of decades. Beef production, sheep raising and dairying still predominate as the main agricultural pursuits whilst grain is still an important crop in the north of the Shire. Agricultural activities represent 356,242 HA or (45.2%) of the total 784,047 HA which comprise Glenelg Shire.

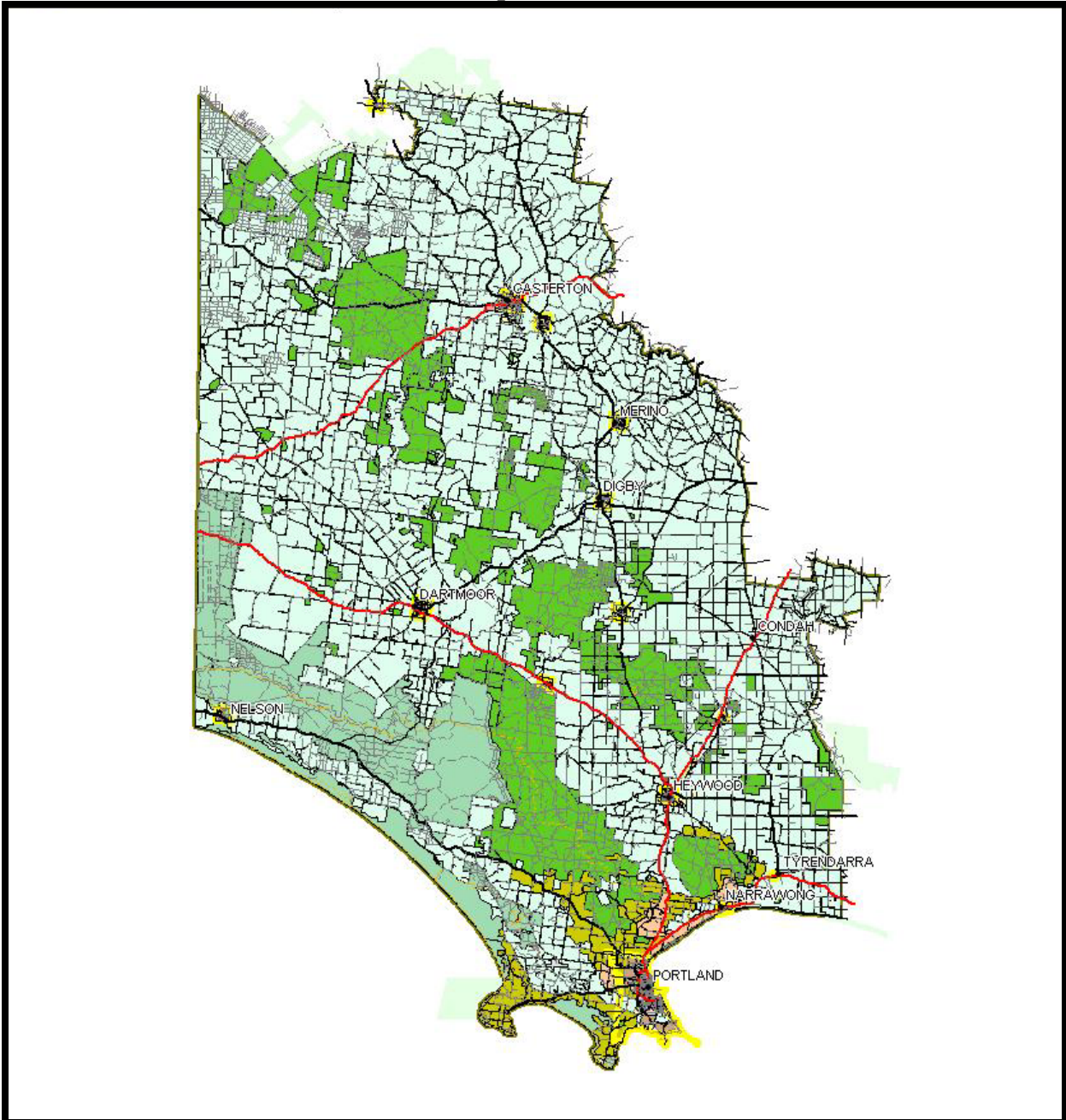
Map 3 Grazing Modified Pastures



Source: Victorian Department of Primary Industry

Grazing activity which is coloured red on Map represents 304,058 hectares. It stretches from the north of the Shire to the southern limits of the Shire and represents the 85% of all area used in agriculture. Modified grazing activity is undertaken on 69% of all agricultural parcels in Glenelg.

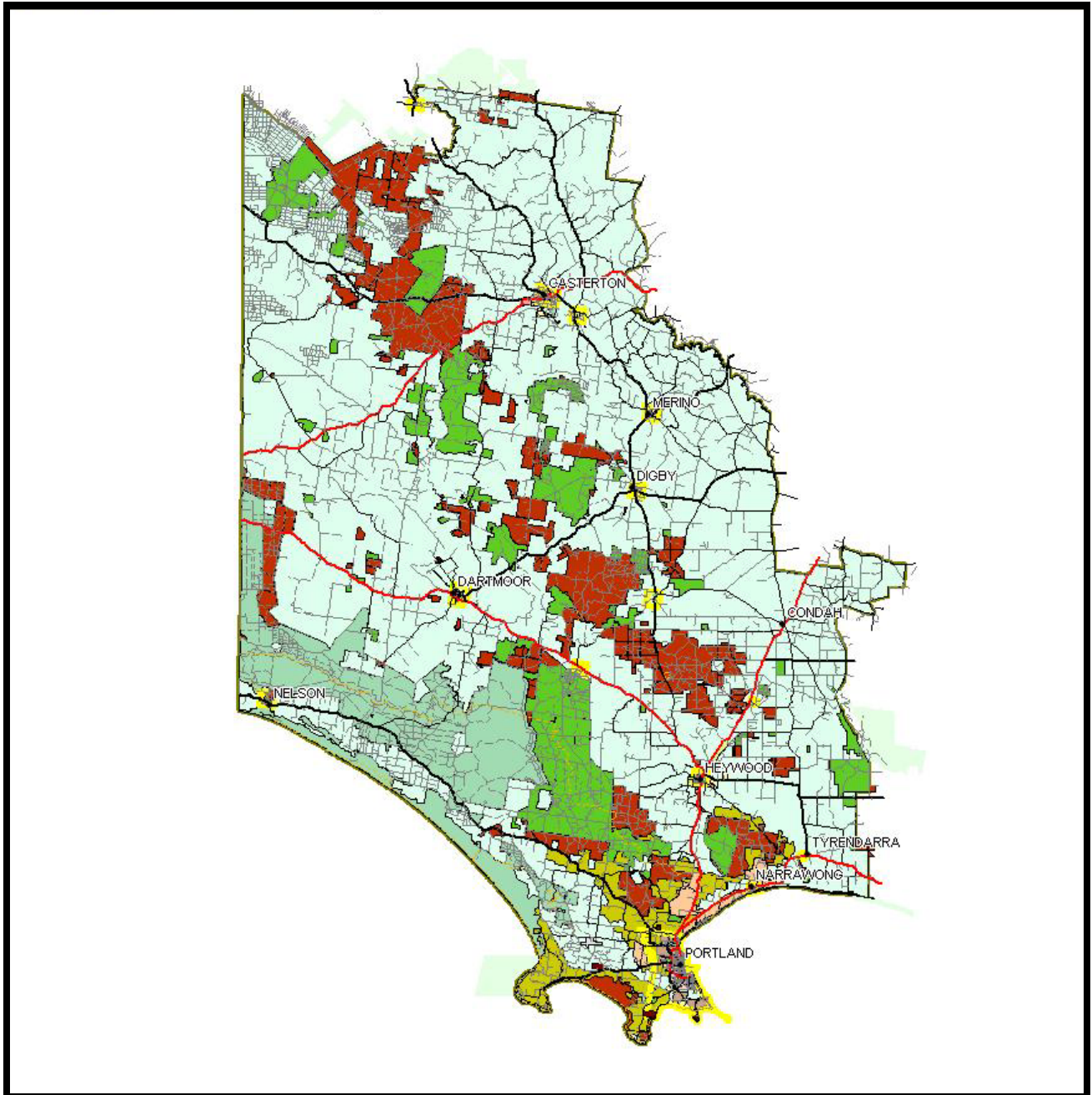
Map 4 Roads



Source: Victorian Department of Primary Industry

Glenelg Shire has over 7,000 kilometers of declared and non declared roads. The roads are a combination of paved and unpaved surfaces. Road constitute 123,831.7 hectares in Glenelg.

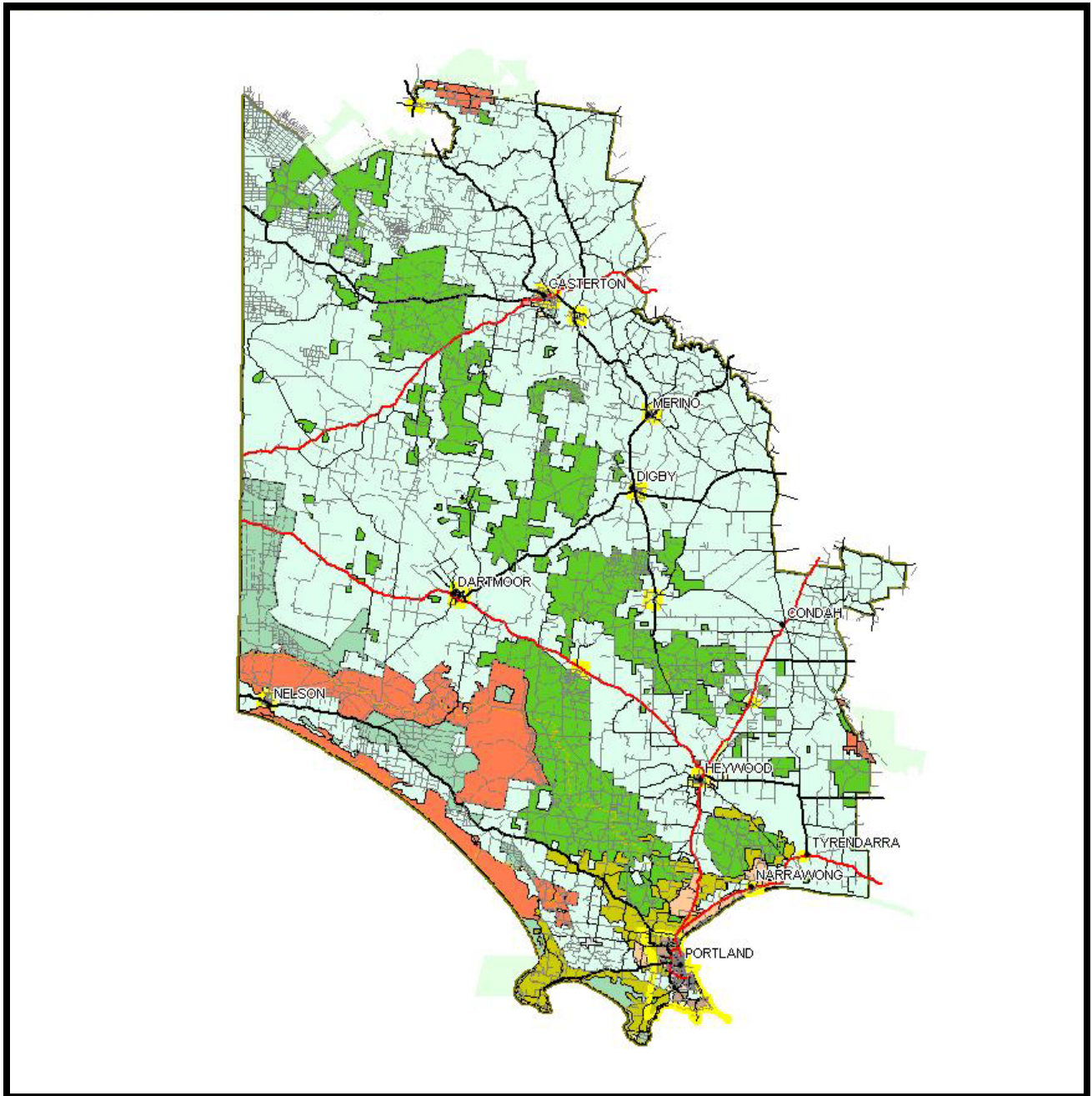
Map 5 Other Conserved Areas



Source Victorian Department of Primary Industry

Conserved areas represent 71,976.18 hectares and are coloured brown on Map 5.

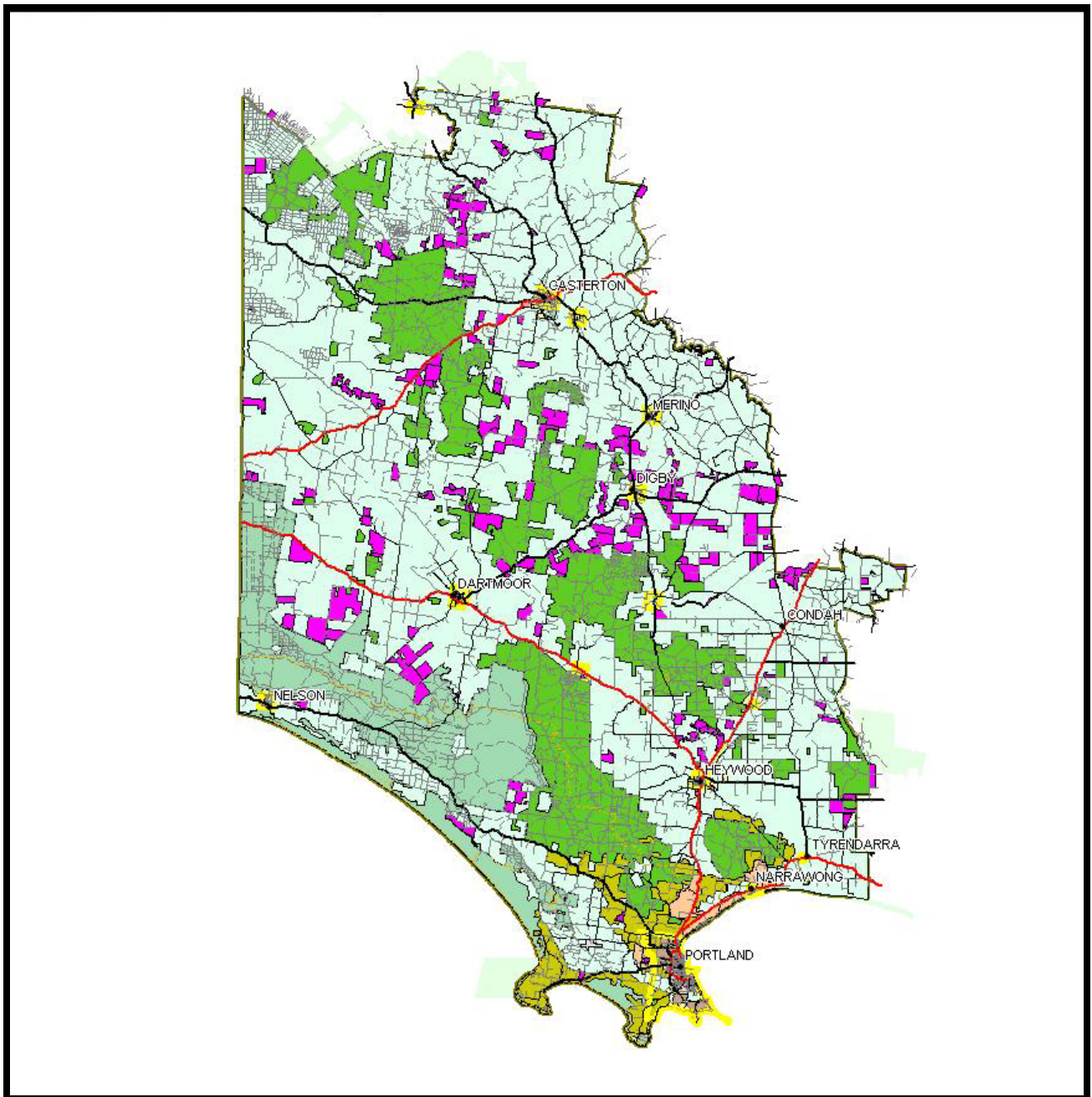
Map 6 National Parks



Source: Victorian Department of Primary Industry

There is a series of national parks in Glenelg stretching from Nelson in the west to Tarragal in the east. National Parks in Glenelg have a combined area of 46,406.35 hectares and are coloured orange on Map 6.

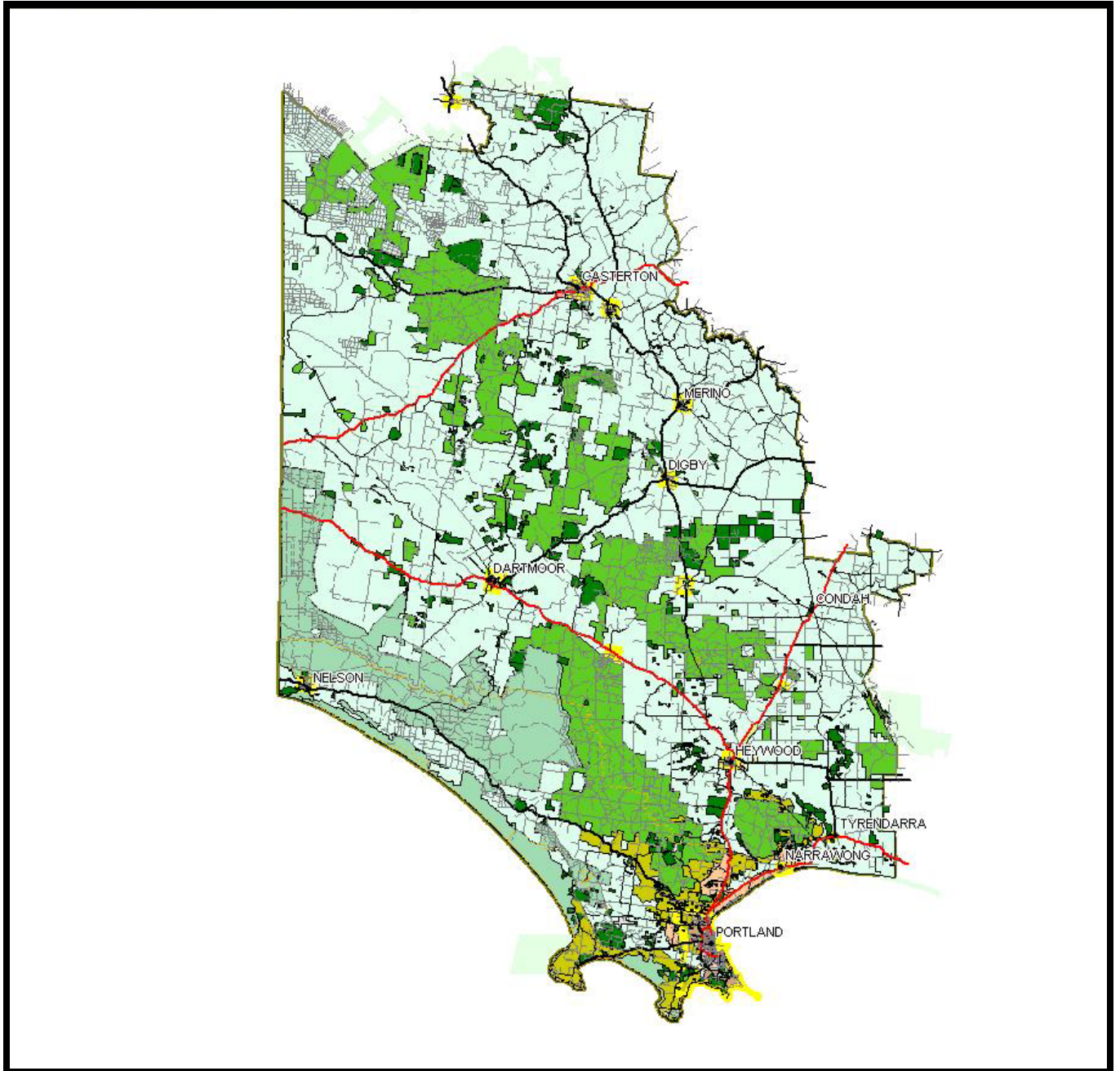
Map 7 Hardwood Production



Source: Victorian Department of Primary Industry

Hardwood production is dispersed throughout the central portion of the Shire. Major activity points for hardwood production include north of Heywood and the Digby area. Hardwood production area is coloured purple on Map 7 and represents 33,884.25 hectares.

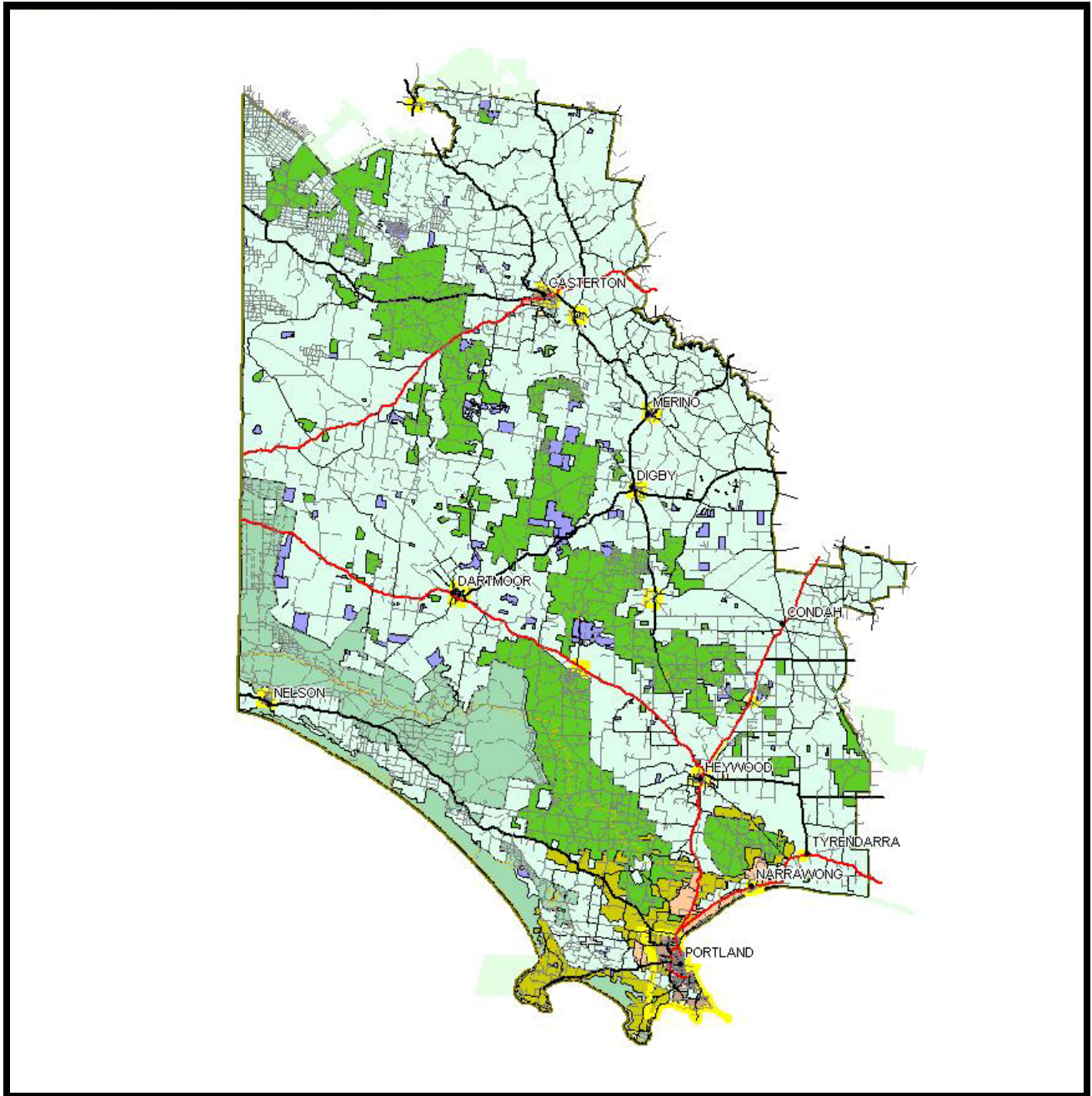
Map 8 Grazing Natural Vegetation



Source: Victorian Department of Primary Industry

Natural grazing pastures occur throughout the Shire. The greatest concentration is in and around the Portland area. Natural grazing represents 29,908.29 hectares and is coloured dark green on Map 8.

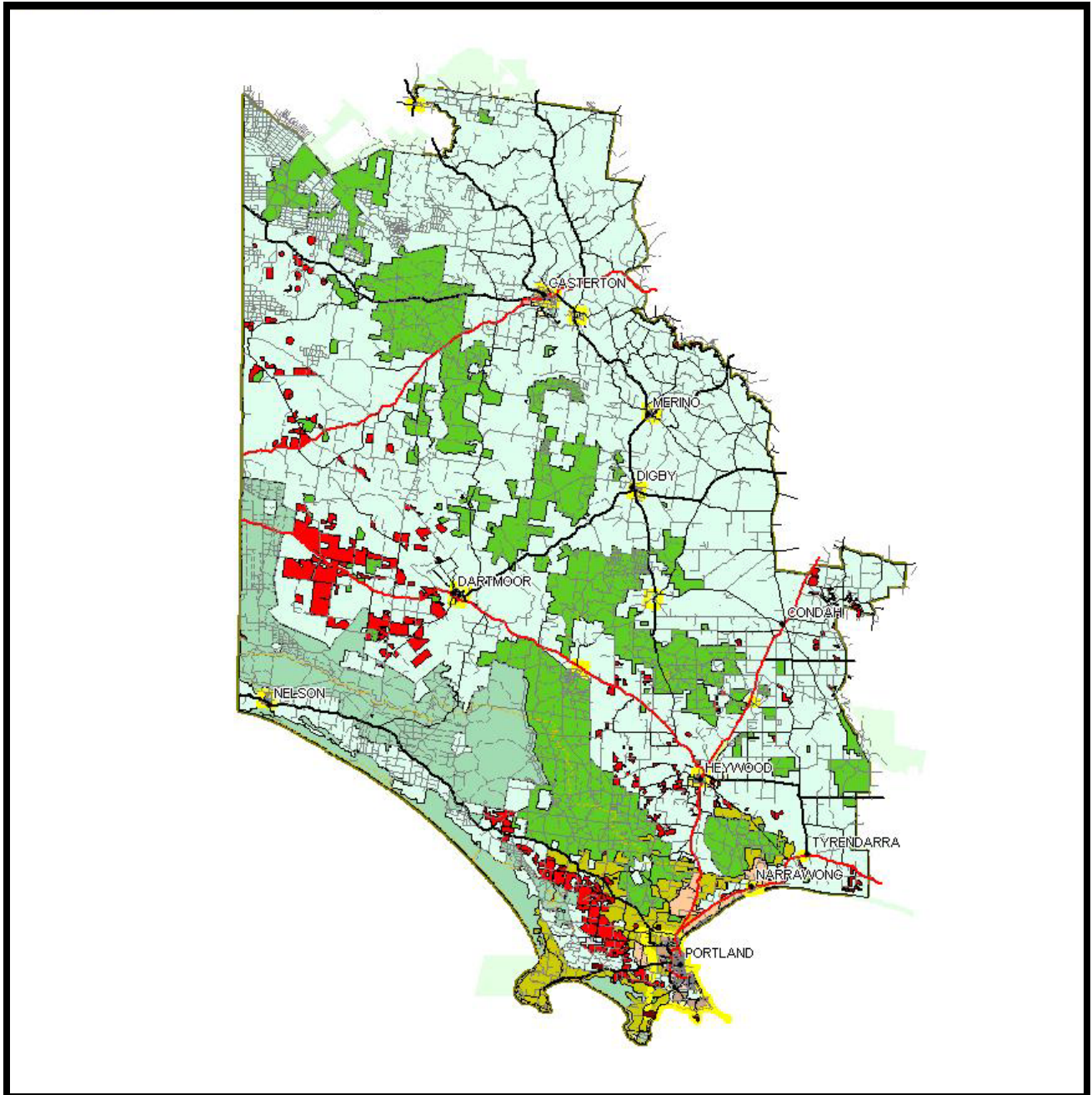
Map 9 Production Forestry



Source: Victorian Department of Primary Industry

Production forestry is centered in two areas - the first is to the west of Digby and the second is west of Heywood. Production forestry areas are coloured purple on Map 9 and have an area of 26,989.22 hectares.

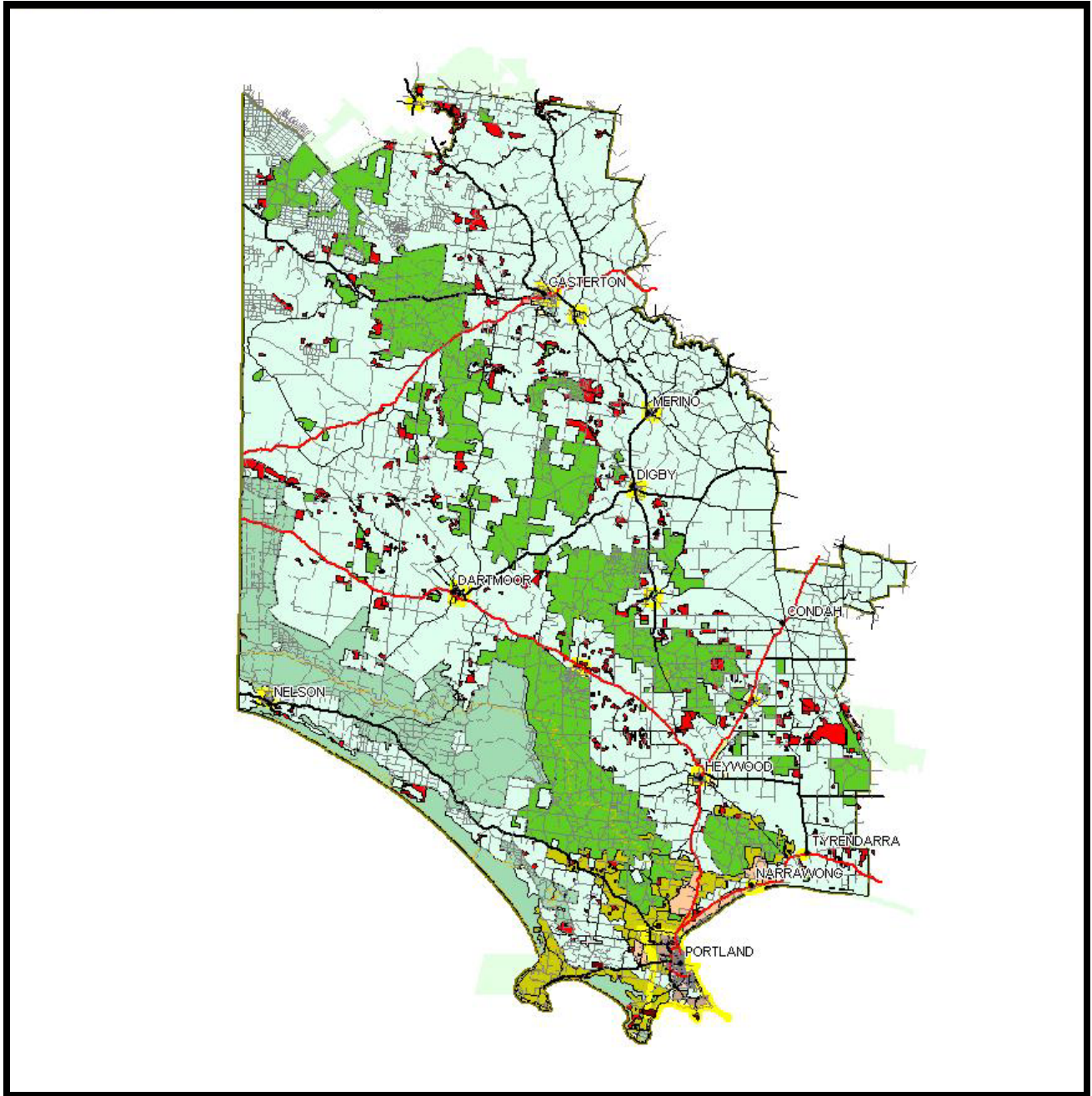
Map 10 Irrigated Modified Pastures



Source: Victorian Department of Primary Industry

Controlled irrigation areas are located to the west of Portland near Cashmore, Trewella and Curries. Other irrigation areas in the Shire include: to the west and south west of Heywood, the Dartmoor, Lake Mundi and Kaladbro area. The controlled irrigation areas are coloured red on Map 10 and have an area of 21,099.66 hectares.

Map 11 Remnant Native Cover



Source: Victorian Department of Primary Industry

Remnant native cover is coloured red on Map 11 and has an area of 19,259 Hectares.

6 Soils

6.1 Introduction

The soil types that are found in the Glenelg Hopkins region area are diverse, with their diversity related to the parent rocks and sediments from which they formed and the geomorphological history. Broadly, all soils are the product of (a) weathering of the mineral constituents present at the location where they are found as well as (b) any materials that have been or are being added from external sources by wind and water, (c) any materials that have been or are being lost to external areas, and (d) internal translocations described in general theoretical form by Simonson (1959).

In the Glenelg Hopkins area, over many millions of years, the alumino-silicate minerals that make up most rocks and unconsolidated deposits have been losing a large proportion of their silica. The fractions that remain have become proportionally enriched in aluminium compounds and iron compounds. Bauxite and laterite are the end products. The associated clay minerals have lower cat ion exchange capacities than those that have not lost silica. Therefore they are poorer from a soil fertility point of view.

The oldest basalt flows in the region were deposited 3-5 million years ago. These flows have weathered so strongly that they have become bauxitised (bauxite is an aluminium ore with a very high content of aluminum oxide (Al_2O_3) and aluminium hydroxide ($Al(OH)_3$) or gibbsite), and ferruginised by forming laterite. Laterite is a secondary rock dominated by iron oxide-hydroxides such as goethite and hematite.

In 2006, the Victorian Department of Primary Industry undertook a new soils classification study for the region. The study described the broad categories of soils that exist in south west Victoria. The soil order is highlighted in Table 13.

Table 13 Soils of Glenelg

Name of Order	Good For	Derivation	Connotation
Anthrosols	Rarely used for agriculture	Gr. <i>anthropos</i> , man	Human-made soils; soils that at least partially are the result of materials transported by humans, often contain artefacts, thoroughly modified by humans
Organosols	Natural environment	Organic matter dominates	Dominantly organic materials, e.g. peat
Rudosols	Conservation and broad acre	L. <i>rudimentum</i> , a beginning	Rudimentary soil development, negligible soil horizonation or structure development, may be full of local bedrock fragments
Tenosols	Conservation and natural environment	L. <i>tenuis</i> , weak, slight	Weak soil development, slight colour differentiation, some organic matter accumulation
Podosols	Conservation and natural environments	Rus. <i>pod</i> , under; <i>zola</i> , ash	Podzol soils, having a Bs, Bh or Bhs horizon (respectively an accumulation of sesquioxides, i.e. aluminium and iron oxides, humus or humus sesquioxides); if these accumulations have formed a cemented layer, it is often called coffee rock
Vertosols	Grain and dry acre crops	L. <i>vertere</i> , to turn	Clays with very pronounced shrinks well behaviour; crack widely and deep when dry
Hydrosols	Broad acre and conservation	Gr. <i>hydor</i> , water	Wet soils, soils that suffer prolonged seasonal saturation
Kurosols	Broad acre		Have strong texture contrast between A and B horizons, and strongly acidic in the upper B horizon, pH < 5.5; Duplex soils
Sodosols	Horticulture		Influenced by sodium, have strong texture contrast between A and B horizons, are sodic in upper B horizon with pH > 5.5; Duplex soils
Chromosols	Broad acre cropping	Gr. <i>chroma</i> , colour	Often bright coloured, have strong texture contrast between A and B horizons, are non-sodic in upper Bo horizon, with pH > 5.5; Duplex soils
Calcarosols	Conservation and natural environments	L. <i>calcis</i> , lime	Calcareous throughout the profile or below the A1 horizon, lacking strong texture contrast between A and B horizons
Ferrosols	Broad acre and dry land agriculture	L. <i>ferrum</i> , iron	High free iron content in the B2 horizon. Often referred to as krasnozems, from the Russian: <i>krasno</i> = red, <i>zem</i> = soil
Dermosols	Broad acre cropping	L. <i>dermis</i> , skin	Often having clay skins on ped faces, lacking strong texture contrast between A and B horizons, B2 horizon is structured
Kandosols	Broad acre and conservation	Kandite (1:1) clay minerals	Lacking strong texture contrast between A and B horizons, B2 horizon is structureless or has only weak structure. They can have small amounts of illite (2:1) clay, but are mainly kaolinitic with iron oxides

Source: Victorian Department of Primary Industry

Large parts of the Glenelg Hopkins Catchment Management Authority (GHCMA) area are covered by so-called Duplex soils (*Sodosols-Chromosols-Kurosols*, depending on sodicity and pH of B horizon). Duplex soils are soils which have a lighter textured topsoil (A horizon) resting abruptly on a much heavier textured subsoil (B horizon). The chief mechanism involved in creating the texture contrast between A and B horizons is biological rather than mineral weathering. Soil inhabiting animals, like worms, termites, ants, etc., bring up soil and worm casts to the surface, where they are subject to raindrop impact and surface run-off. The finest soil particles therefore are preferentially removed leaving the coarser particles at the surface.

Apart from weathering processes that alter bedrock and change it into soil, the diversity of soils in the GHMCA area is also due to differential erosion and deposition. The Dundas and Merino Tablelands are old landscapes and have been attacked by erosion from streams that are able to incise themselves and carve out deep valleys. Their tributaries similarly attack the edges of the Tablelands. Thus the slopes leading down to these streams now intercept the deeply weathered profiles and expose different weathering zones.

Near the coast the soils of the most recent dunes, mapped as Discovery Bay land system, contain a large proportion of finely broken up seashells which are made up of lime (calcium carbonate). Older coastal dunes further inland and mapped as Nelson land system, have been subject to leaching by rainfall and downward movement of the lime. The lime has not been washed out altogether and has cemented lower parts of the sand to form relatively soft secondary limestone. Both are classified as Calcarosols.

Soil Problems that have been identified in Glenelg Shire include:

Soil acidification which has been caused by the removal of bases like calcium and magnesium in farm produce, accelerated leaching of bases resulting from increased nitrogen additions by legumes and fertilizers

Soil salinity that has been caused by increased groundwater recharge by decreased transpiration

Soil water logging caused by decreased transpiration, decreased runoff and increased rainwater infiltration. Note certain parts of the landscape are naturally collecting run-off and seepage

Soil compaction caused by trafficking by animals and equipment; reduction of biological life in the soil.

Loss of soil structure which has several causes such as inappropriate cultivation, trafficking, loss of organic matter, salinity and sodicity, including irrigation with high bicarbonate water

Soil erosion caused by the loss of surface vegetative cover, injudicious cultivation, development of salinity or extreme acidity

Land slips caused by loss of perennial vegetative cover, changed soil hydrology (see soil-water logging)

Nutrient losses caused by removal by produce, increased water percolation

Acid sulphate soils caused by exposure of sulphidic swamp soils to air and drainage of sulphidic discharge zones in uplands; some acid sulphate soils associated with groundwater discharge zones

Soil contamination caused by spillage and excessive use of farm chemicals from pesticides to fuels, and also associated with industrial sites where chemicals and industrial materials have contaminated the soil

Soil organic matter decline caused by frequent and inappropriate cultivation, poor crop rotations and lack of pasture phase

Soil biota decline caused by excessive cultivation and use of farm chemicals and fertilisers, monoculture. No problems were identified by this survey. However, this may well reflect a lack of knowledge and reporting

Loss of perennial vegetation caused by cropping and use of annuals in pastures, clearing of trees and shrubs

7 Current Climate Conditions

The Glenelg climate is characterised by hot dry summers and cool, wet winters. Average annual rainfall ranges from 600 mm per year near Casterton to more than 910 mm per year in the Cobboboonee Forest, west of Heywood and the Grampians. The region has high winter rainfall. A notable feature of the regional climate is the consistency of rainfall, 700mm is the average rainfall and over the past 120 years there have only been two years with less than 350mm and 2 years with more than 1,000mm. By Australian standards this is remarkably consistent. Average annual temperatures range from 4 deg to about 27 deg in the north, with January and February being the hottest months. Climate change projections developed by the CSIRO suggest that in the future the region will have slightly higher average annual temperatures, with coastal areas being least affected by this change. Warming will be greatest in spring and least in winter. Overall, it is predicted average annual rainfall will decrease slightly with less summer and autumn rain. Projections also indicate episodic heavy rainfall events will increase in frequency. The climate and weather data was obtained from the Department of Meteorology. The Bureau has a series of locations across Glenelg which collect rainfall and climate data. Some of these stations are new whilst others have operated since the early 1880's. Rainfall data was obtained from the following stations; Nelson, Portland, Heywood and Casterton. Temperature and climatic data was obtained for Casterton, Heywood and Portland.

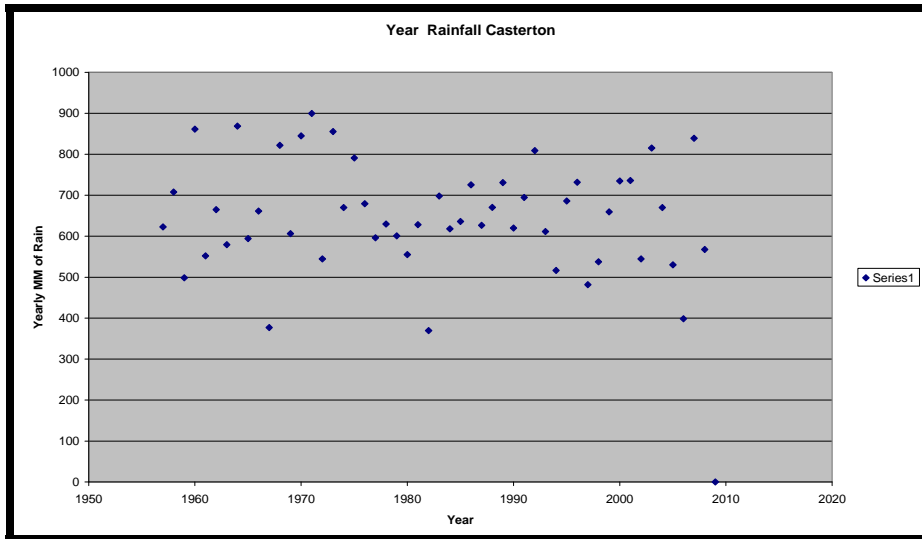
7.1.1 Rainfall

The following charts indicate monthly and annual rainfall for various locations,

7.1.2 Casterton

The Casterton weather station has been in operation since 1956. The amount of rainfall recorded at this station has ranged from 400 mm to 900 mm per annum.

Map 12-Yearly Rainfall in Casterton



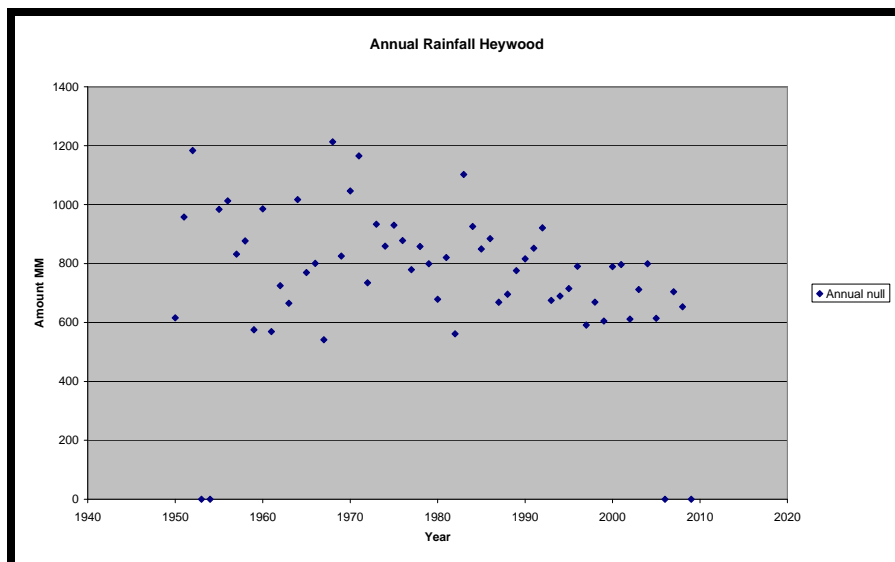
Source: Bureau of Meteorology

In past 10 years the variation in rainfall has been the highest since the Casterton recording station opened. The rainfall has varied from 398 mm to 900 mm per annum.

7.1.3 Heywood

The Heywood weather station opened in 1949. The amount of rainfall recorded at this station has ranged from 600 mm to 1100 mm per annum.

Map 13 Yearly Rainfall in Heywood



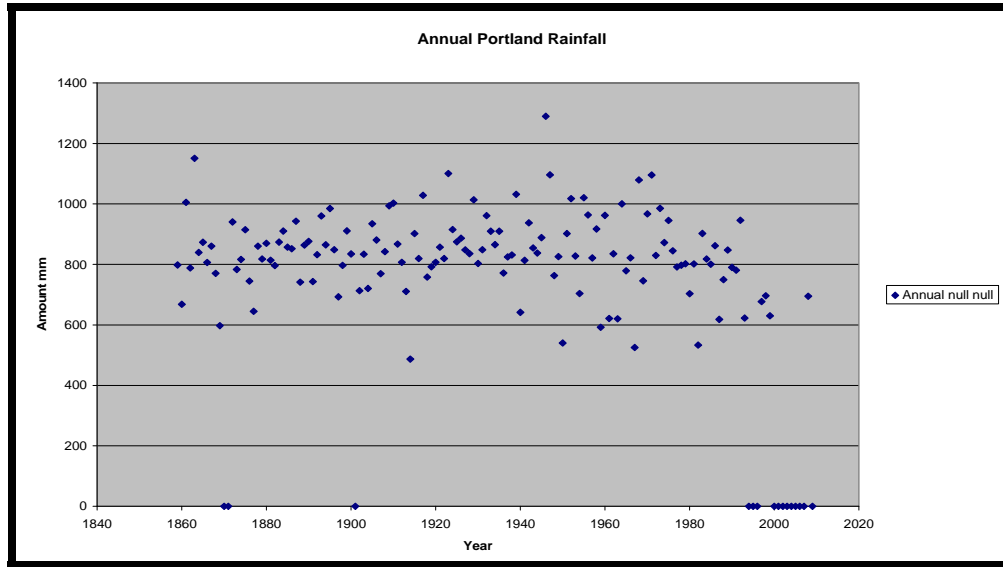
Source: Bureau of Meteorology

In the past 10 years the variation in rainfall has averaged around 150 mm. The rainfall has varied from 600 mm to 800 mm per annum.

7.1.4 Portland

The Portland weather station opened in 1857. The amount of rainfall recorded at this station has ranged from 600 mm to 1100 mm per annum.

Map 14 Yearly Rainfall in Portland



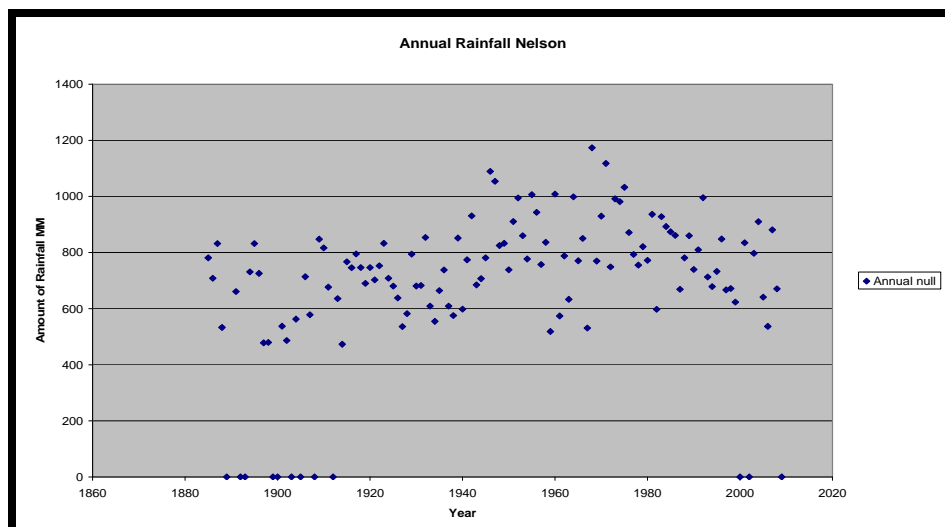
Source: Bureau of Meteorology

Recorded data at the Portland weather station for the past 10 years is incomplete and does not provide an accurate representation of rainfall patterns for the Portland area.

7.1.5 Nelson

The Nelson weather station opened in 1884. The amount of rainfall recorded at this station has ranged from 550 mm to 1100 mm per annum.

Map 15 Yearly Rainfall in Nelson



Source: Bureau of Meteorology

Recorded data at the Nelson weather station for the past 10 years is incomplete and does not provide an accurate representation of rainfall patterns for the Nelson area.

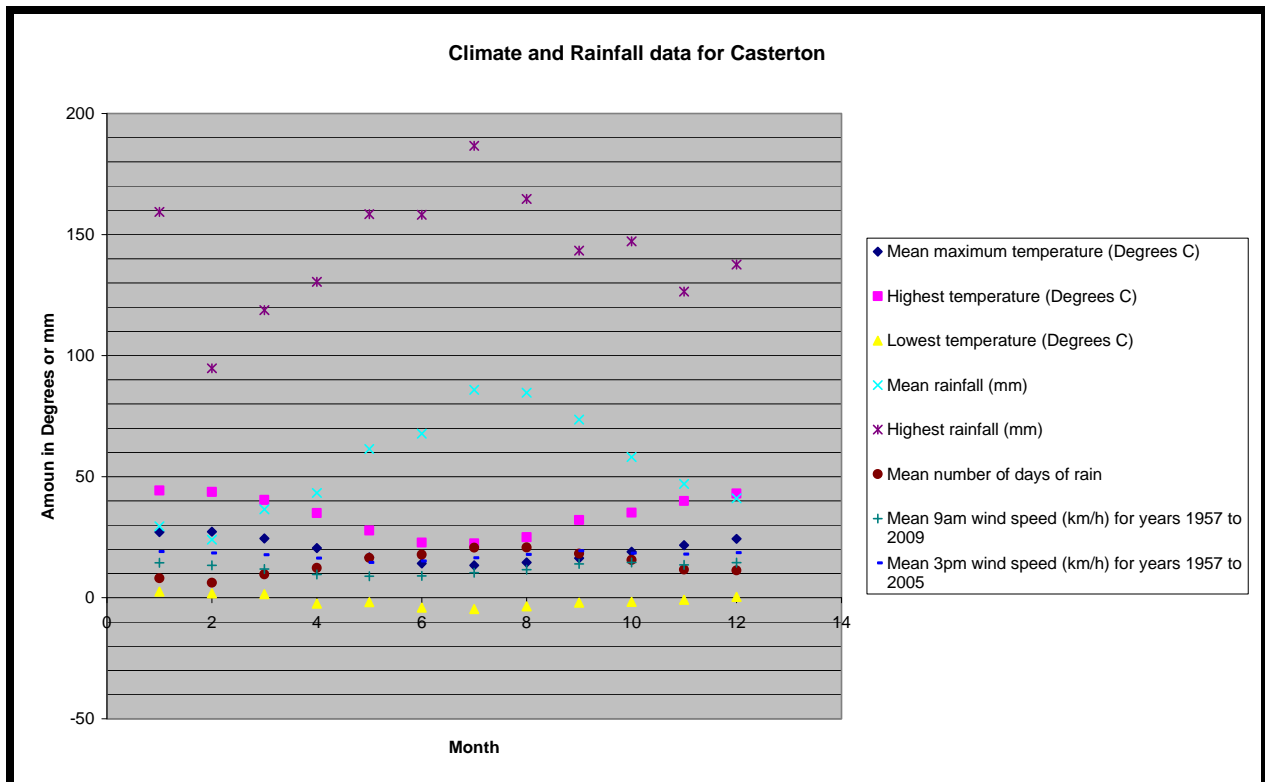
7.2 Climate Data

7.2.1 Casterton

A series of climate information is portrayed in the following graph includes:

- Mean maximum temperature per month
- Highest temperature recorded per month
- Lowest temperature recorded per month
- Highest rainfall recorded per month
- Mean rainfall recorded per month
- Mean number of days of rainfall per month
- Mean wind speed at 9 am
- Mean wind speed recorded at 3 pm

Map 16 Climate and Rainfall data for Casterton



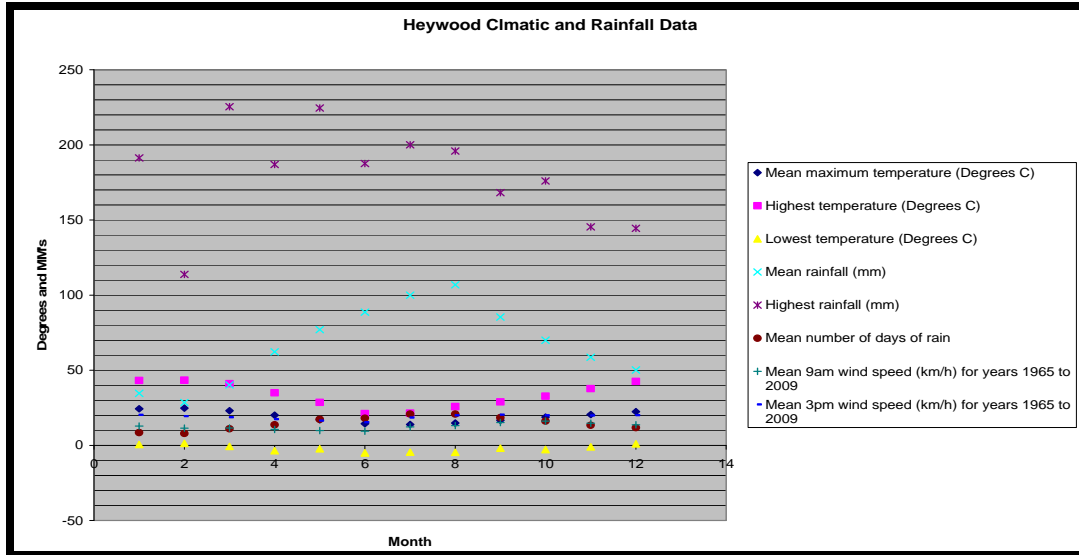
Source: Bureau of Meteorology

The Mean average temperatures in Casterton ranges from 14 to 27 degrees on average with the highest temperatures approach near 45 degrees. Wind speed in the Casterton area averages between 14 and 20 kilometers.

7.2.2 Heywood

The Mean average temperatures in Heywood range from -4 to 27 degrees on average with the highest temperatures approach near 45 degrees. Wind speed in the Heywood area averages between 10 and 21 kilometers.

Map 17 Climate and Rainfall data for Heywood

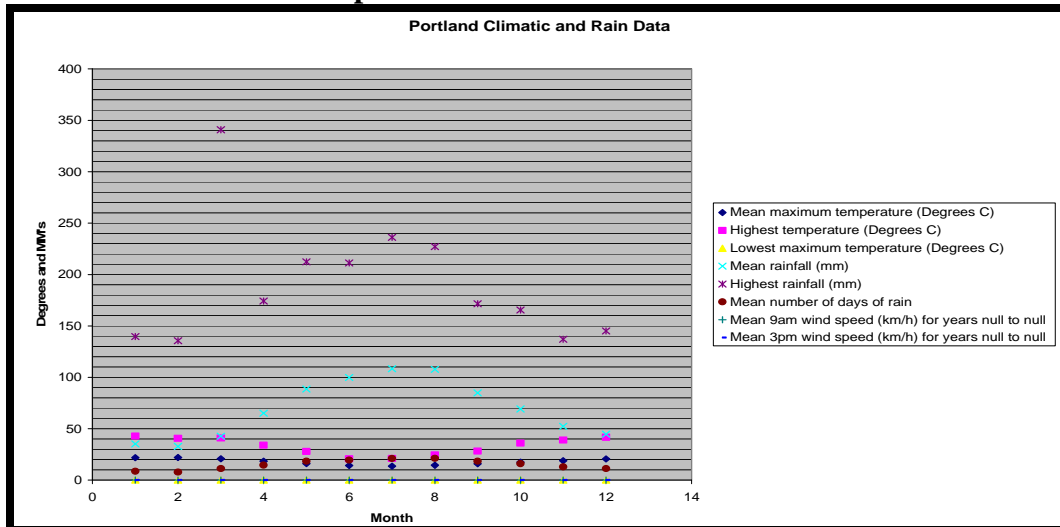


Source: Bureau of Meteorology

7.2.3 Portland

Data relating to wind speed and the lowest minimum temperature to be recorded in Portland was only partially recorded at the Portland recording station.

Map 18 Climate and Rainfall data for Portland



Source: Bureau of Meteorology

7.3 Future climate forecast and impacts through the advent of Climate Change

The future climate of the Glenelg region is expected to be hotter and drier than it is today. The Victorian government has predicted that the impact of climate change on Victoria will include:

- Higher global and regional temperatures, more hot days, fewer cold days
- Global sea level rise
- Decreasing Victorian rainfall in winter and spring
- Increasing Victorian potential evaporation
- Declining Victorian soil moisture
- Increased risk of bushfire in Victoria
- Increasing storm surge heights in Victoria
- Increasing intensity of extreme rainfall in summer and autumn in Victoria
- Decreasing Victorian rainfall in summer and autumn
- Decreasing annual average stream flow in Victoria
- Increased drought frequency, intensity and duration in Victoria
- Abrupt changes, such as a step-change in rainfall, rapid melting of polar ice sheets or changes in global ocean currents
- Changes in small-scale storm phenomena, such as tornadoes, hail and wind-gusts

8 Flooding Patterns in Glenelg

8.1 Introduction

There are significant areas within Glenelg Shire that are prone to flooding. Glenelg Shire in conjunction with the Glenelg Hopkins Catchment Management Authority has conducted major studies relating to impacts of flooding on Portland, Casterton and Heywood.

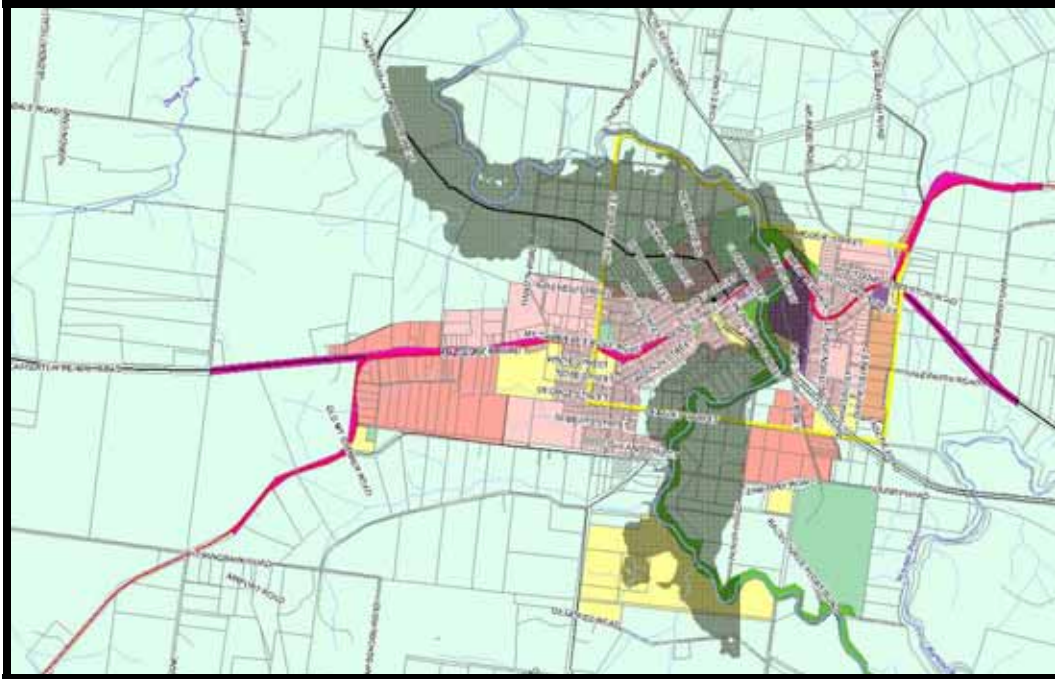
Studies examined the flooding potential for the three towns (Portland, Casterton and Heywood) on a 10 and 100 year scenario basis.

8.1.1 Casterton Flooding

The 10 year and 100 year flood scenarios indicated that 420 parcels would be impacted by a one in ten year flooding incident and 430 parcels would be impacted by a one in one hundred year flooding incident.

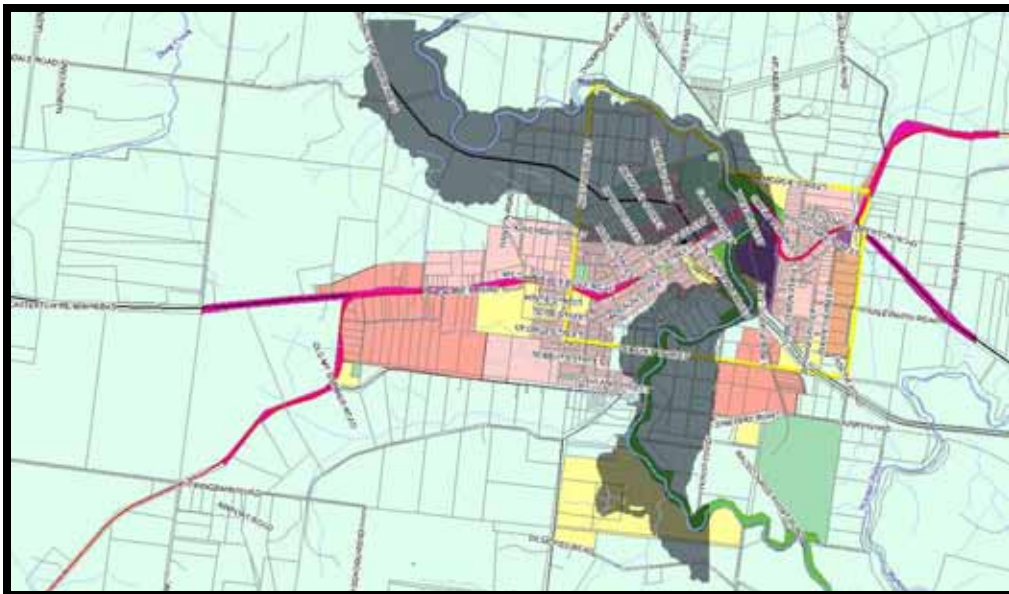
The 10 and 100 year floods would impact on the central business core of Casterton.

Map 19 Casterton 10 Year Flooding Pattern



Source: Glenelg Flooding Study

Map 20 Casterton 100 Year Flooding Pattern



Source: Glenelg Flooding Study

8.1.2 Heywood Flooding

The 10 year and 100 year flood scenarios indicated that 65 parcels would be impacted by a one in ten year flooding incident and 153 parcels would be impacted by a one in one hundred year flooding incident.

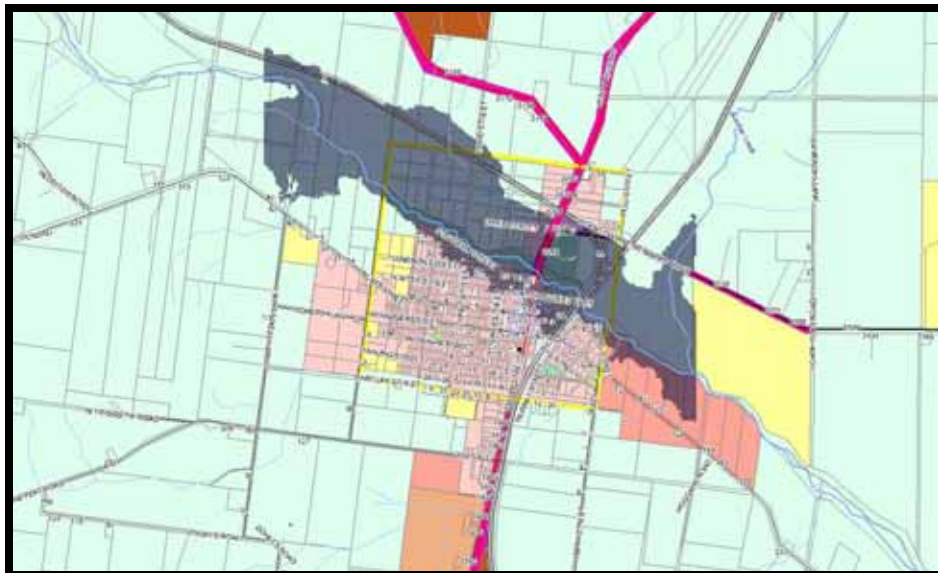
The 10 and 100 year floods would impact on the northern section of Heywood.

Map 21 Heywood 10 Year Flooding Pattern



Source: Glenelg Flooding Study

Map 22 Heywood 100 Year Flooding Pattern



Source: Glenelg Flooding Study

Map 23 Heywood Combined Flood Map showing 10 and 100 Year Floods



Source: Glenelg Flooding Study

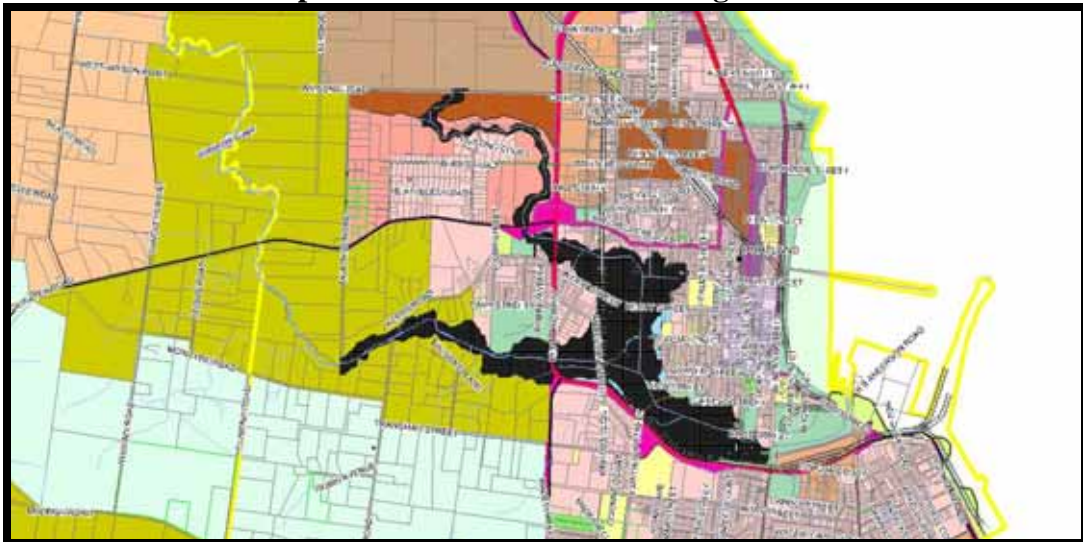
The Heywood combined flooding map highlights the increased area which would be exposed in a 1 in 100 year major flooding incident.

8.1.3 Portland flooding

The 10 year and 100 year flood scenarios indicated that 145 parcels would be impacted by a 1 in 10 year flooding incident and 229 parcels would be impacted by a 1 in 100 year flooding incident.

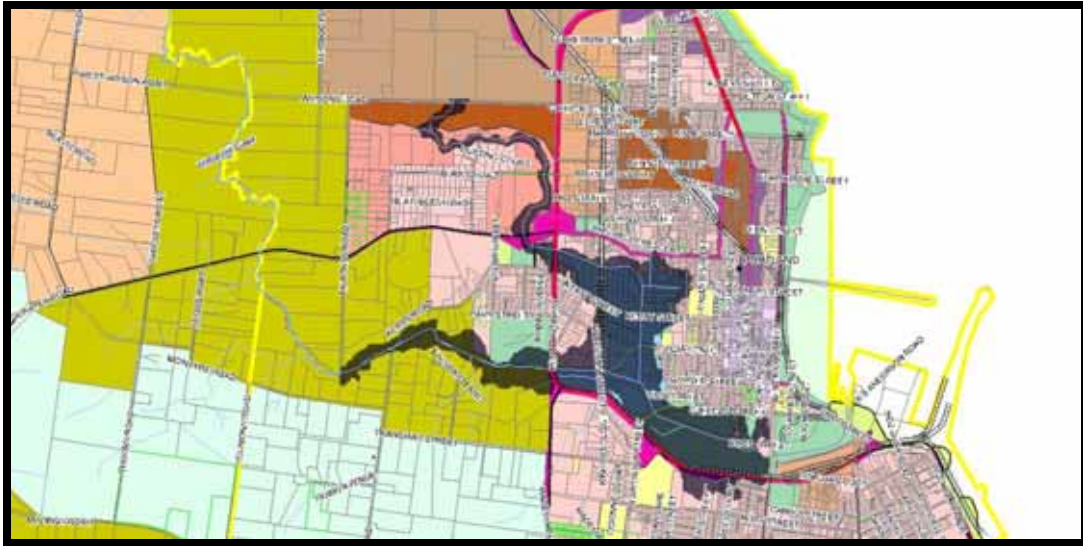
The 10 and 100 year floods would impact on the central section of Portland.

Map 24 Portland 10 Year Flooding Pattern



Source: Glenelg Flooding Study

Map 25 Portland 100 Year Flooding Pattern

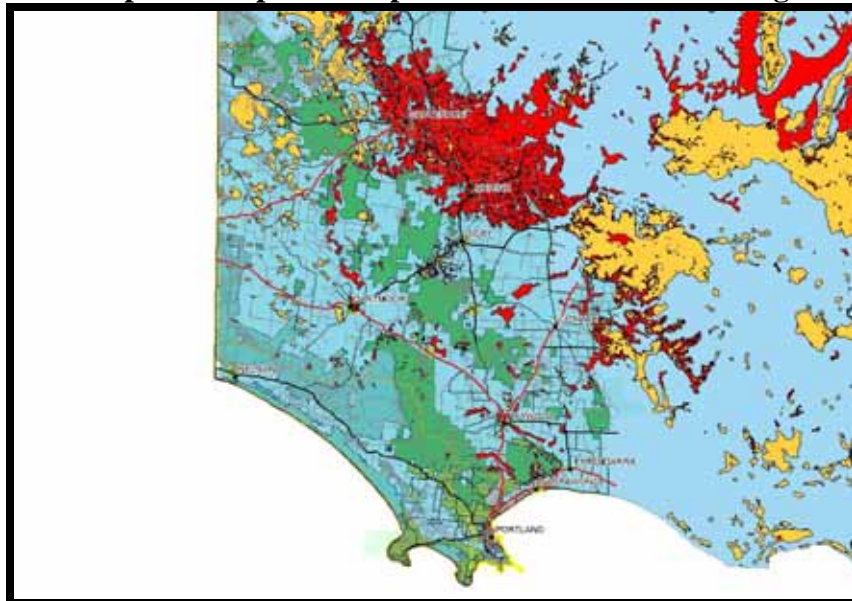


Source: Glenelg Flooding Study

9 Wind Erosion

Glenelg Shire is prone to wind erosion. The Victorian Department of Primary Industry conducted tests throughout western Victoria to identify areas of low, medium and high wind erosion. The red areas in the north represent areas of high wind erosion. Gold areas in the north and central areas of the Shire are areas of medium wind erosion and the blue areas which cover most of the Shire represent areas of low wind erosion.

Map 26 Composite Map of Wind Erosion in Glenelg



Source: Victorian Department of Primary Industry

10 Salinity

Glenelg Shire has inland areas which impacted by the effects of salinity. These areas are mainly situated near Casterton. The Victorian Department of Primary Industry will by 2012 undertake salinity studies relating to the impact of salinity on coastal areas

Map 27 Glenelg Salinity Map

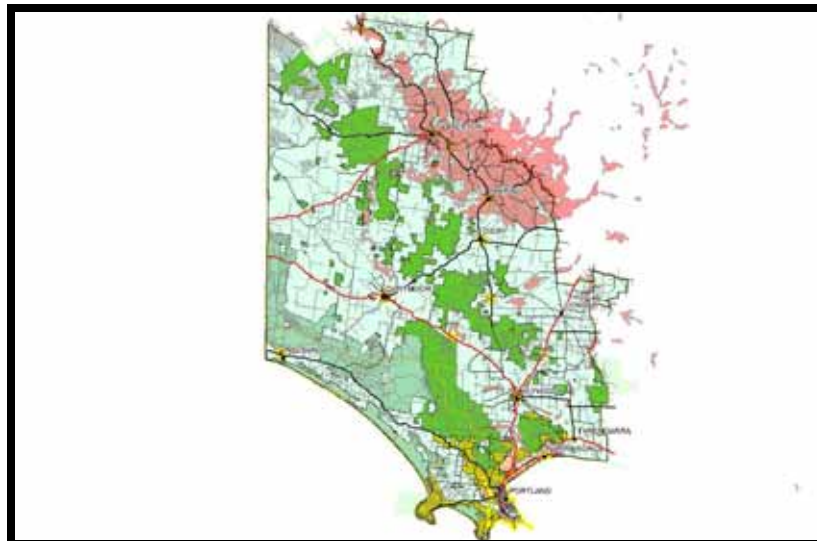


Source: Victorian Department of Primary Industry

11 Mass Movement (Earthquakes and Soil Movements)

The vast majority of Glenelg has a very low probability for either earthquakes or the movement of cliffs and soil. The Shire has one area of high potential and that is centered on the Casterton area and is colored red on the Mass Movement Map.

Map 28 Areas of Mass Movement in Glenelg



Source: Victorian Department of Primary Industry

12 Cliff and Shoreline

A number of processes are impacting on the shoreline. The current shoreline shape has come about mainly due to the impact of wave erosion on the specific geological make up of the cliffs. “The change to the coastline which may well have led to this situation is the construction of the breakwaters associated with the Port of Portland.” (Golder Associates, 2000) Fourteen processes are described in the Table. The Portland coast and greater foreshore which stretches to Narrawong and beyond has experienced over the past 30 years a series processes which have reduced the shoreline, eroded the cliffs, soil slippage and increased the number of sinkholes in the general coastline area. Table 14 illustrates what processes are impacting the Portland Coastline.

Table 14 Processes impacting on the Glenelg Cliffs and Shoreline

Processes	Area		
	Cliff Base	Slope	Crest
Wave Erosion	Undercutting; Caves Removal of slumped soil New Fossils exposed Erosion of previous groynes Construction of riprap	Wetting and Drying New Fossils exposed	
Long Shore Drift	Lack of sand on beach		
Surface Water Erosion	Eroded surface water channel Talus Slopes	Eroded pathways Areas beneath shade trees	Gullies Sinkholes
Weathering	Softening	Wetting and Drying	
Groundwater Seepage	Seepage		Subterranean Caves
Soil Slip	Slumped soils Talus slopes	Slumped Soils Shape of Shoreline Falling Trees	Back Scarps Tension Cracks Shape of Crest Undermined bridge
Soil Creep			Tension Cracks Patched Roadway Kerb movements Leaning Power poles
Rock Slope Instability		Toppling	Toppling
Direct Human Impact	Excavation for fossil collection Beach renourishment	Excavation for fossil collection Pathways Drainage Installation	Pathways Dumping garden rubbish

Source: Golder Associates

The human intervention has had a direct impact on the condition and stability of the Glenelg cliffs and foreshore. Golder stated that direct human impacts on the cliffs include the creation of pathways on the cliff face which are further eroded by surface water. In the 2000 study they state that there are only a few points over the 3 km length of the Portland cliff where safe access can be made from the crest to the foreshore.

The destruction of vegetation and the abrasion by foot traffic, not allowing plants to reestablish, is creating surface erosion. This will only worsen with time through continued usage of pathways.

Cliff instability is associated with local and overall failure of the cliff face leading to general coastline regression. Cliff regression cannot be arrested only managed in an effort to achieve a balance between inevitable natural processes and the needs of the people of Portland. (Golder Associates)

Table 15 Processes impacting on the Glenelg Cliffs

Processes	Cliff Base	Slope	Crest
Indirect Human Impact	Foreshore become erosion zone due to construction of breakwaters		Mounding Soil Construction of Embankment Installation of water pipes Tree planting Irrigation Construction of roads and housing
Drainage and Sewerage	Old sewer pipes Damaged sand pipe \Damaged Drains	Trenches Blocked and broken dams	Manholes Trenches Blocked and broken drains
Services		Service Trenches	Water pipes Irrigation systems
Vegetation		Falling Trees Trees shading slope	Large trees close to crest
Long term cliff regression		Large historical soil slips	Road and building relocated westwards

Source: (Golder Associates)

Section 2 Planning Zones

13 Current Glenelg Planning Zones

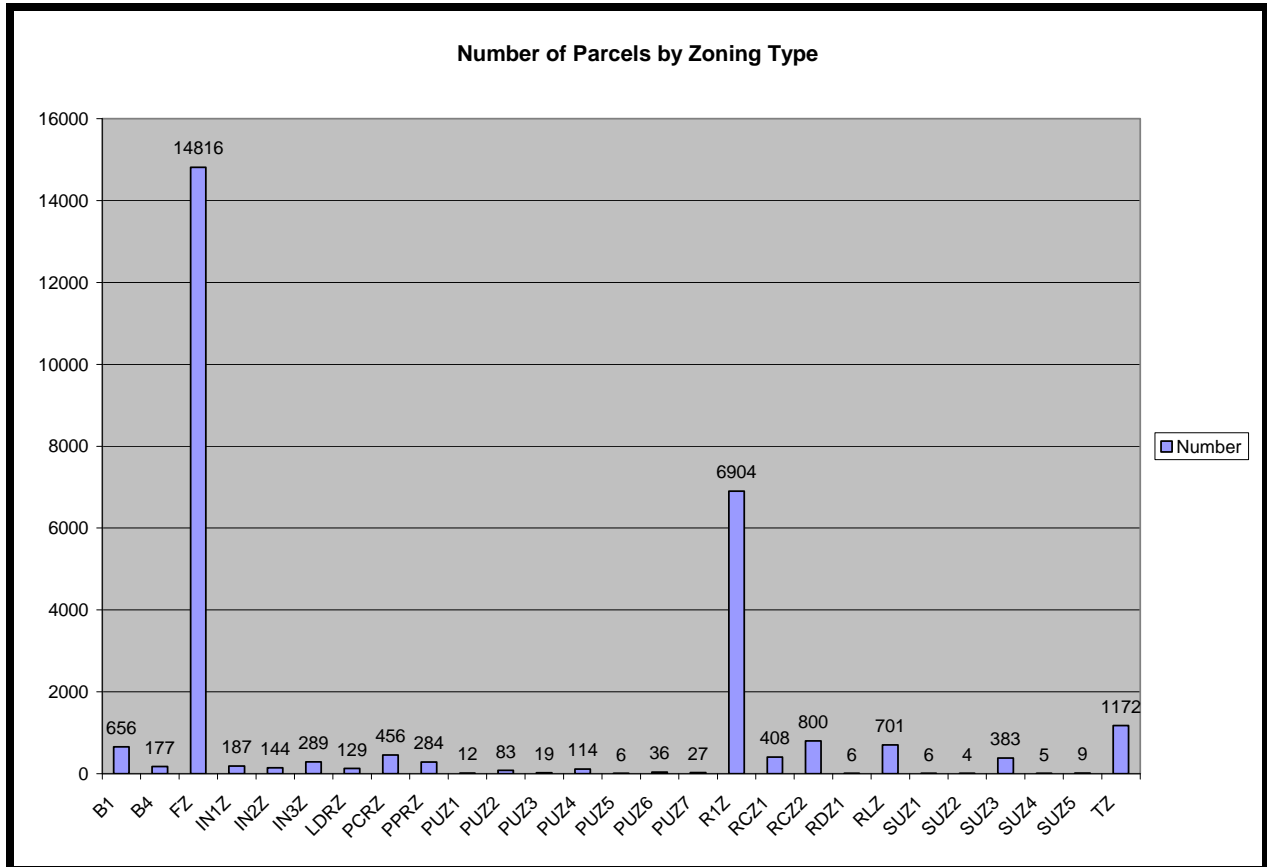
At present Glenelg has 27 major planning zone categories. The current zones which Glenelg Shire employs are highlighted in Table 16.

Table 16 Current Glenelg Planning Zones

Business Zones	
	Business 1
	Business 4
Industrial Zones	
	Industrial 1
	Industrial 2
	Industrial 3
Residential Zones	
	Residential 1
	Rural Living zone
	Township
	Low Density Residential
	Farming zone
	Rural Conservation zone
Public Land Zones	
	Public Use Zone
	Public Conservation and Resource Zone
	Public Park and Recreation Zone
	Road Zone
Special Purpose Zones	
	Special Use Zone
	Urban Floodway zone

There are approximately 30,000 parcels of land in Glenelg Shire. Chart 1 illustrates the breakdown and distribution of zoning categories across the Shire.

Chart 1 Number of Parcels per Zoning Category



Source: Glenelg Shire

13.1.1 Physical Development Constraints

13.1.1.1 Portland Physical Development Constraints

Without the implementation of extensive engineering solutions, numerous physical features affect the potential for development to occur in Portland and its surrounds (Figure 8). These include:

- Ridgeline located in the north of Portland
- Large elevation differences throughout the region
- Fragmented development in the south west
- Aluminium smelter development buffer zone
- Numerous sink holes/ basins
- Coastal erosion
- Extent of flooding

Dutton Way itself presents a number of challenges in terms of providing infrastructure services.

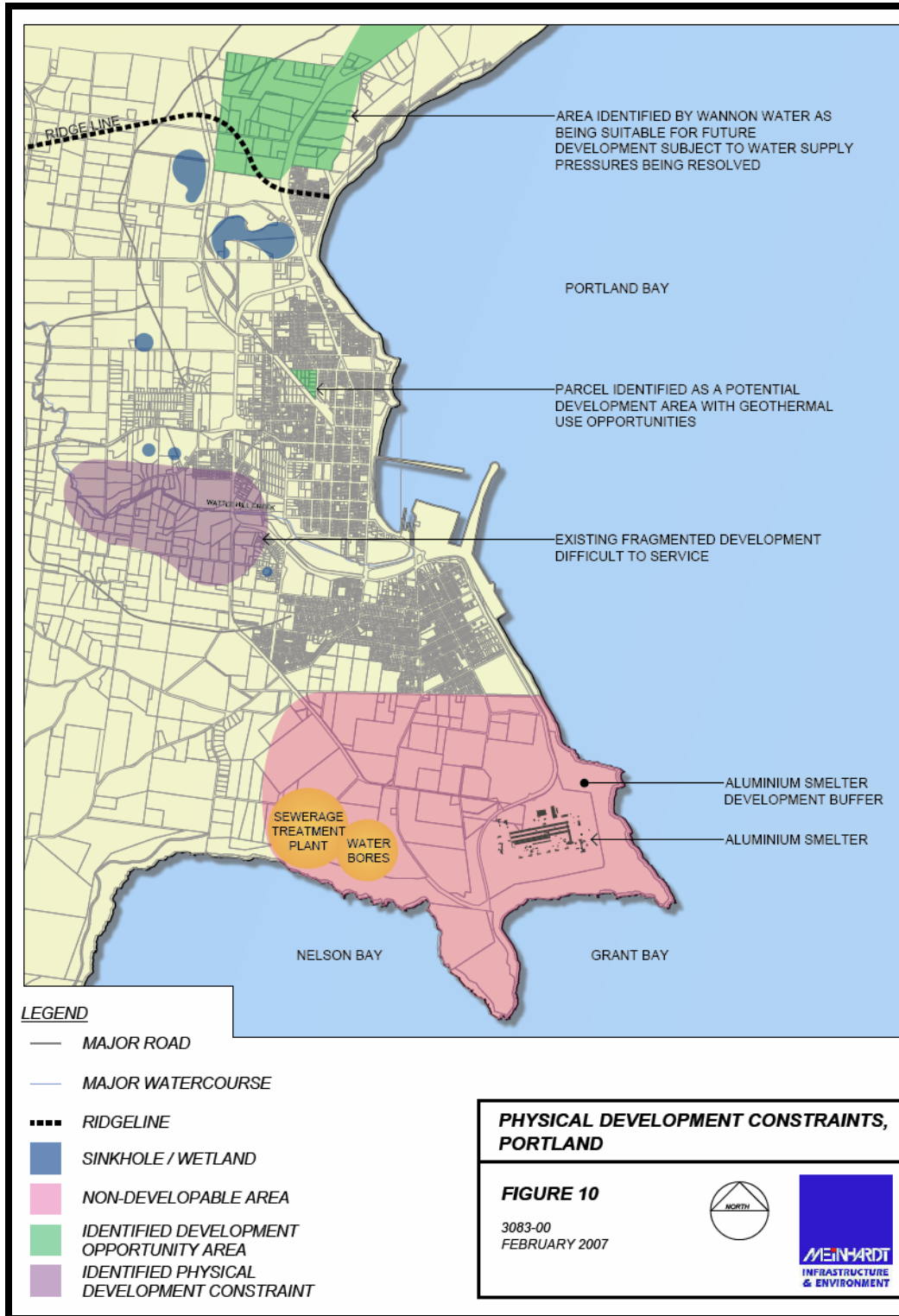
These include:

- Site is situated along the coast for an approximate length of 6km and is typically only 2 lots wide.
- Reticulated sewer does not service the site.
- The existing sea wall is subjected to coastal erosion (believed to be a result of modified current flows due to the construction of the breakwater in Portland harbour but also affected by sea level rise).
- Site is subject to inundation during storm surges.
- No detailed topographical survey of site exists.
- Climate change causing sea level increases, which could lead to inundation of the low lying areas within Dutton Way.

The Port of Portland Authority is required under its operating licence to pump sand from the harbour to the Dutton Way sea wall as part of remedial works. Discussions have identified that this action is currently not undertaken or enforced. This has exposed the sea wall to ongoing erosion issues.

Wannon Water has indicated that they are assessing sewer and water servicing strategies for Dutton Way but are awaiting the results of the Portland to Narrawong Coastal Engineering and Planning Study before making any decisions on the matter.

Map 29 Portland Physical Development Constraints



Source: Glenelg Shire

13.1.1.2 Portland Drainage

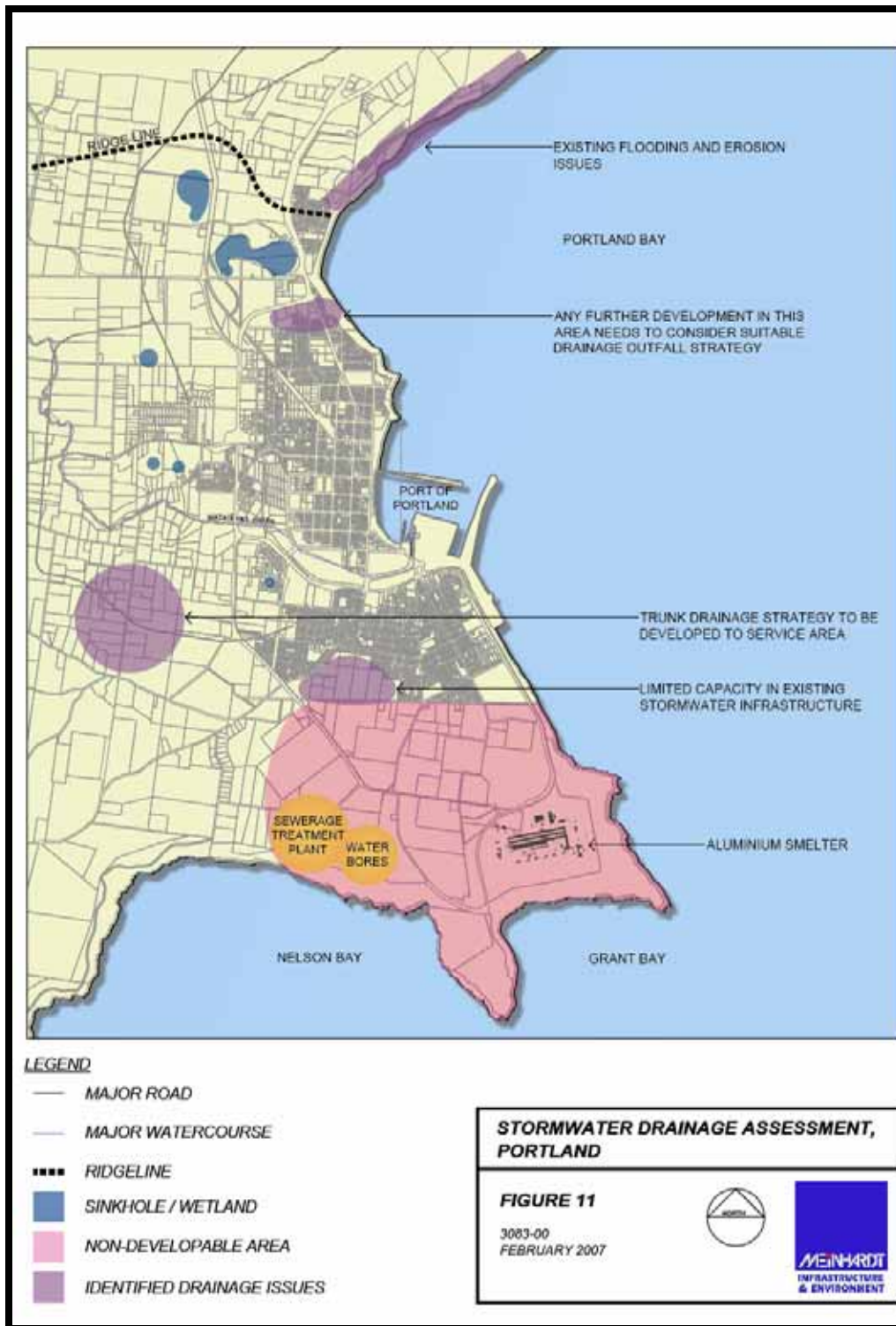
Various issues associated with stormwater drainage have been identified. These issues are highlighted in Table 17.

Table 17 Portland Drainage Infrastructure Issues

Identified Issue	Current Recommended Remedial Action
Untreated urban runoff entering sinkholes, potential of contaminating groundwater	<ul style="list-style-type: none"> • Enforcing WSUD practices can ensure that all stormwater discharges meet the Stormwater Management Targets, as set out in the Urban Stormwater – Best Practice Environmental Management Guidelines (Victoria Stormwater Committee, 1999). • This would eliminate potential groundwater contamination and the contamination of other sensitive water bodies. <p>Lack of trunk infrastructure in north west area (industrial zone)</p>
Lack of trunk infrastructure in north west area (industrial zone)	<ul style="list-style-type: none"> • Council currently investigating strategies to service the area.
Lack of trunk infrastructure in fragmented development area	<ul style="list-style-type: none"> • Council currently investigating strategies to service the area.
Limited capacity in existing infrastructure and Wattle Hill Creek to the south	<ul style="list-style-type: none"> • Enforce onsite attenuation for all new developments. • Restrict developed discharges to pre-developed flows
Poor existing coastal drainage along Hanlon Parade	<ul style="list-style-type: none"> • Council in process of strategizing remediation works for coastal drainage
Flooding of Dutton Way during storm surges	<ul style="list-style-type: none"> • Investigate condition of existing Dutton Way sea wall and erosion and identify and assess potential remedial actions to protect the site

Source: Glenelg Shire

Map 30 Portland Drainage Assessments



Source: Glenelg Shire

13.1.1.3 Portland Water

Existing on-site infrastructure includes two major feed mains that extend from the pumped supply in the south up to Portland North. These mains have sufficient capacity to cater for further development. However, if high demand industries were to be implemented, further assessment of the capacity of existing resources would be required. Wannon Water has undertaken a water services assessment for the Portland area. The findings of this assessment are highlighted in Table 18.

Table 18 Portland Water Services Assessment

Identified Issue	Current Recommended Remedial Action
Existing lots on situated on higher elevations to the south experience supply pressure problems during peak demand periods	Further development would most likely require installation of pressure booster pumps. • Wannon Water currently exploring the need to implement works addressing current pressure supply problems in their next Capital Works Plan (2008 – 2013).
No reticulation infrastructure exists north of the northern ridgeline in Dutton Way.	Water servicing strategy to be determined
Ridgeline presents water supply issues	Booster pumps would be required to service any developments north of the ridgeline.

Source: Glenelg Shire

13.1.1.4 Portland Sewer

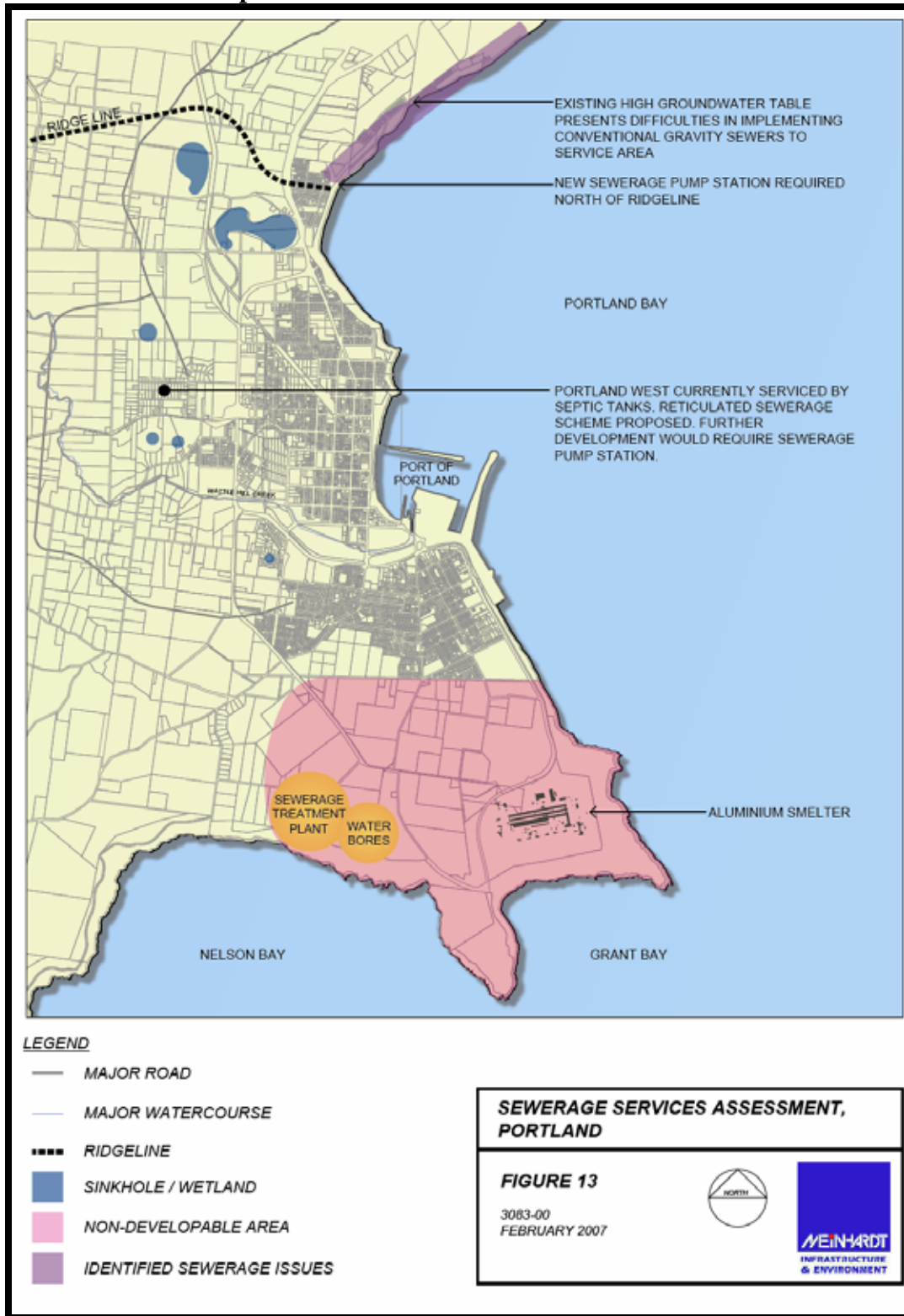
The existing sewer infrastructure in Portland has capacity to cater for infill growth within existing residential zones and for growth up to the northern ridgeline. A sewerage treatment plant exists to the south of the site. Portland West is currently serviced by septic tanks. Wannon Water has undertaken a sewer services assessment for the Portland area. The findings of this assessment are highlighted in Table 19 and Map 31.

Table 19 Portland Sewer Services Assessment

Identified Issue	Current Recommended Remedial Action
Ridgeline presents gravity feed issues	Pump station would be required to pump generated sewerage from Dutton Way to existing treatment plant.
Sewerage becoming stale during pumping from Dutton Way to existing treatment plant	
High groundwater Table in Dutton Way	Investigate alternative servicing strategies suiTable for the site (e.g. low pressure sewer systems)

Source: Glenelg Shire

Map 31 Portland Sewer Services Assessment



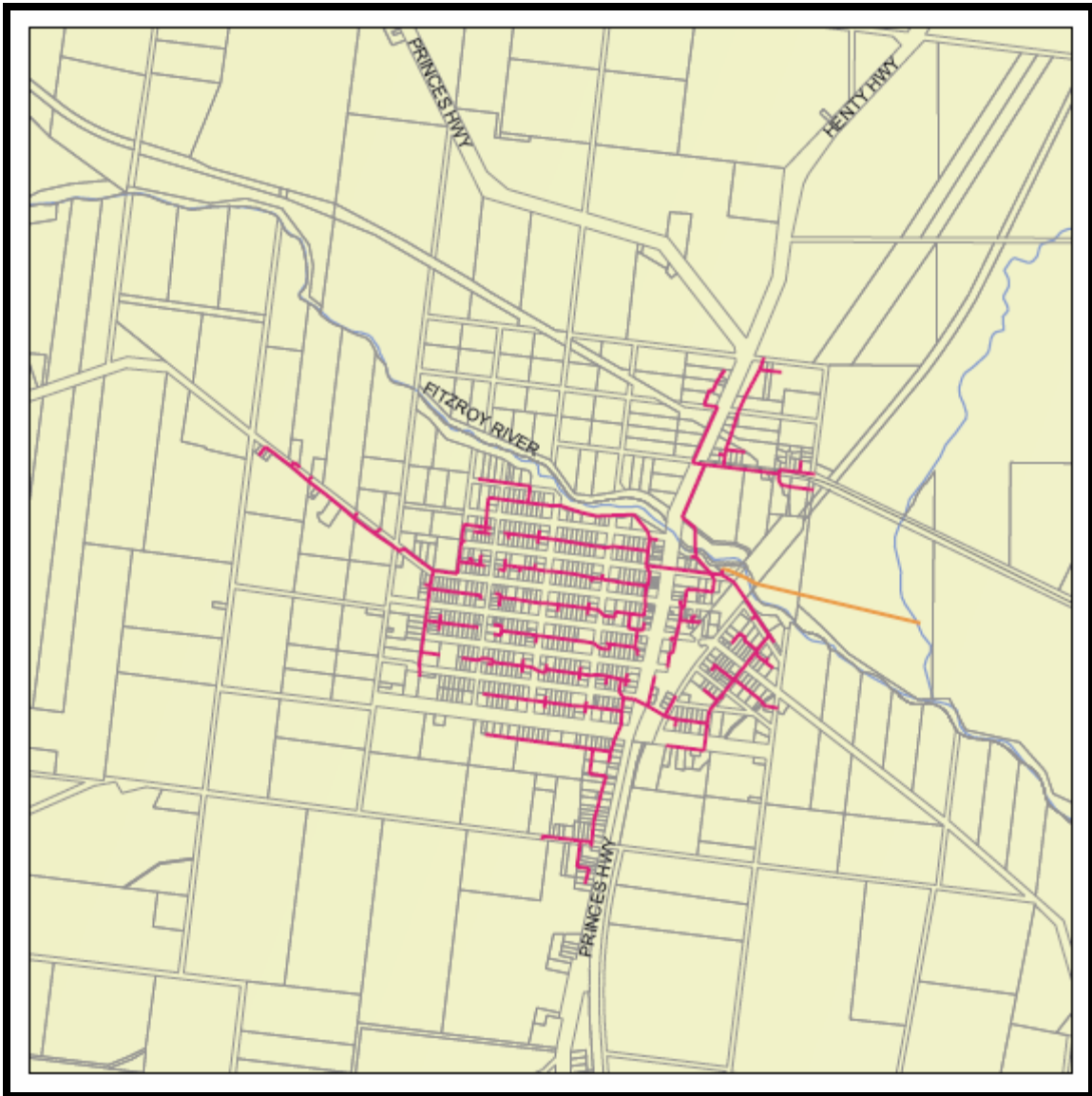
Source: Glenelg Shire

13.1.1.5 Heywood Infrastructure

Heywood is a relatively flat site located inland in the south east of the Shire. Heywood is strategically situated on the main transport routes by road and rail, to Portland. Heywood has reticulated water and sewer services as illustrated in Maps 32 and Map 33.

Heywood utilizes a lagoon treatment system. There is capacity within the existing reticulation and treatment system to cater for further infill growth. However, given the flatness of the site, there is little capacity for development to occur beyond the existing town periphery.

Map 32 Heywood Reticulated Sewer Network



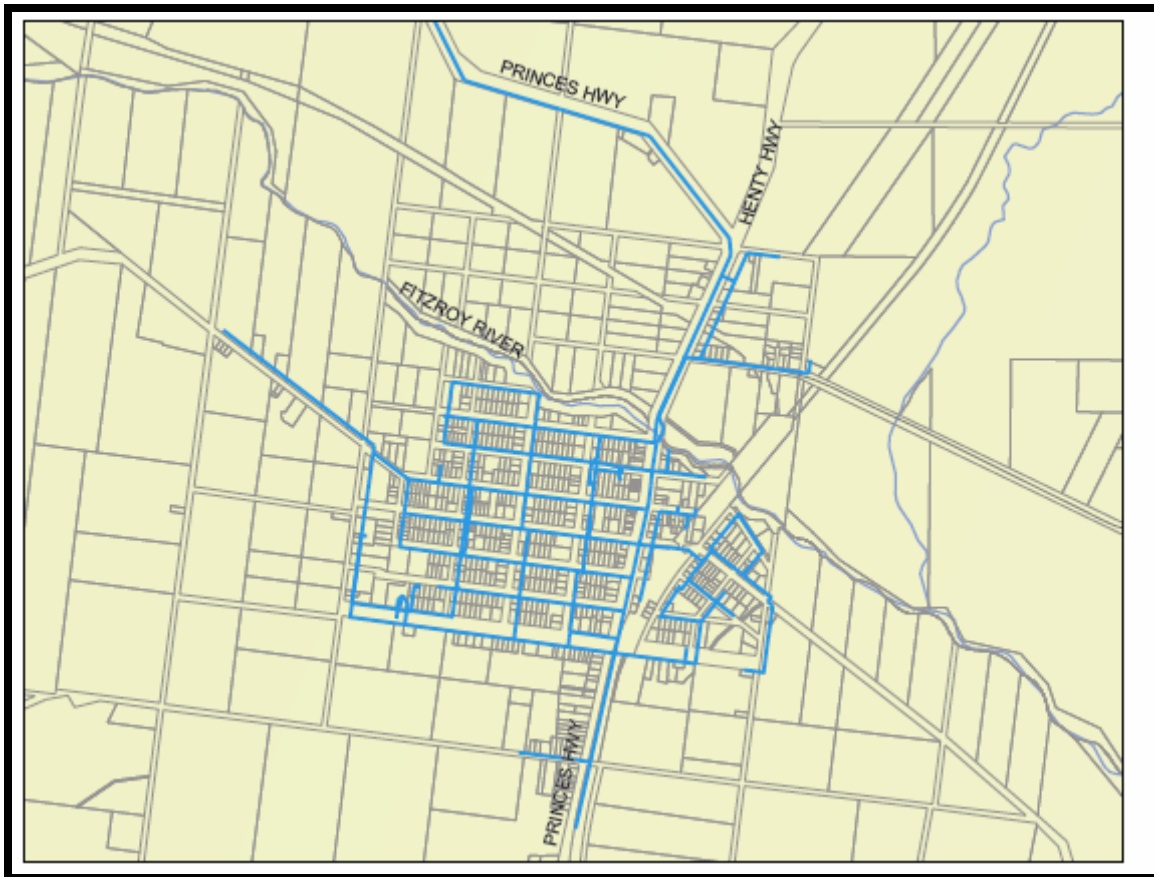
Source: Glenelg Shire

Table 18 identifies the major development constraint regarding future development for Heywood and its surrounding area.

Table 20 Heywood Development Constraints

Service	Description
Drainage	Major open drain along Beavis Street creates potential services clashes should other services need to be extended across the street.
Sewer	Flatness of site only allows for further development within existing town boundaries.

Map 33 Heywood Reticulated Water Network

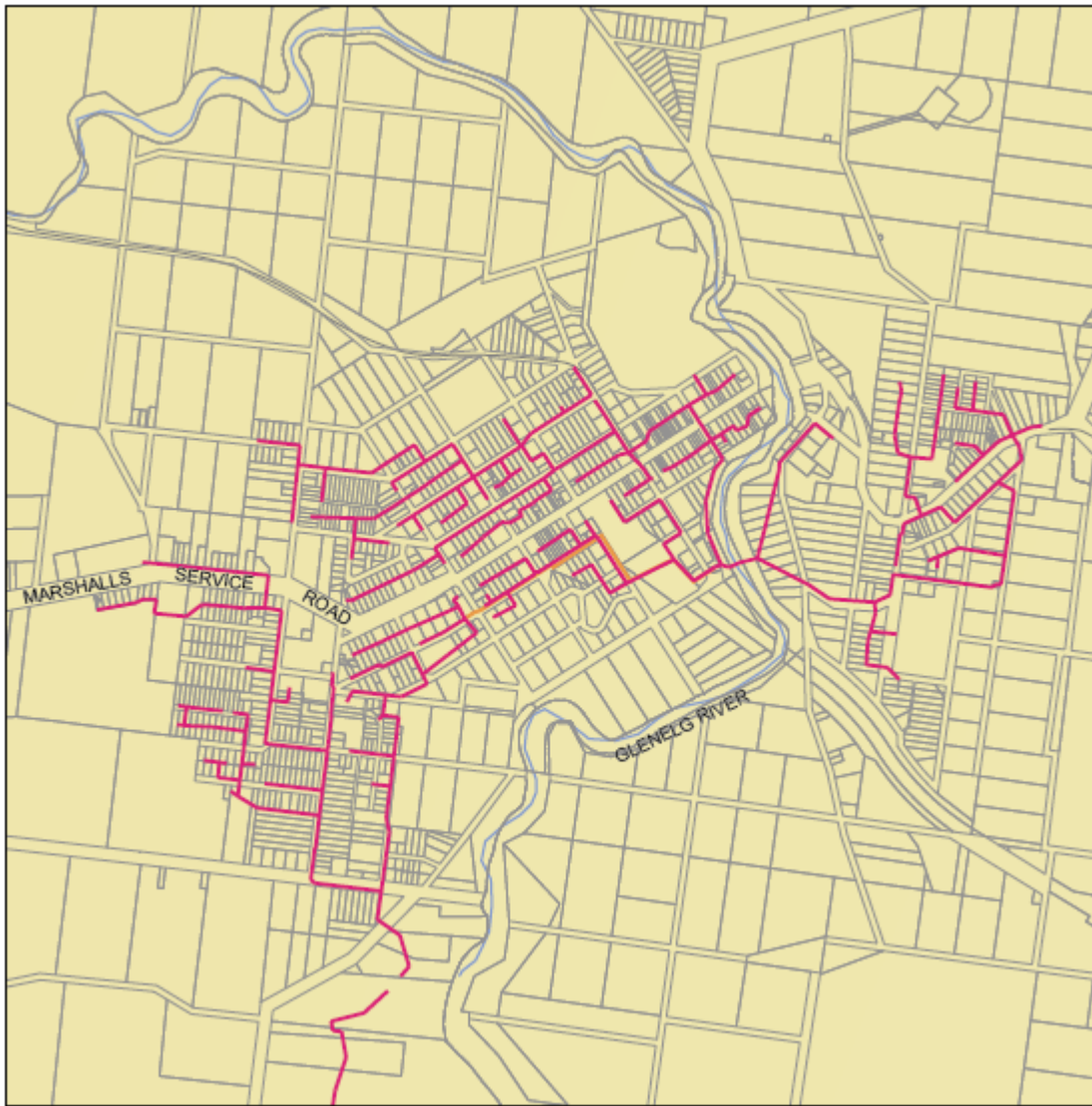


Source: Glenelg Shire

13.1.1.6 Casterton Infrastructure

Casterton is located inland in the northern region of the shire. There is capacity within the system to cater for further infill growth. The existing reticulated sewer and water network are illustrated in Maps 34 and 35. For development to occur beyond the existing town periphery, an assessment of existing site contours would be required to determine the servicing feasibility.

Map 34 Casterton Reticulated Sewer Network



Source: Glenelg Shire

Table 19 identifies the major development constraint for regarding future development for Casterton and its surround area.

Table 21 Casterton Development Constraints

Service	Description
Sewer	Flatness of site only allows for further development within existing town boundaries

Map 35 Casterton Reticulated Water Network

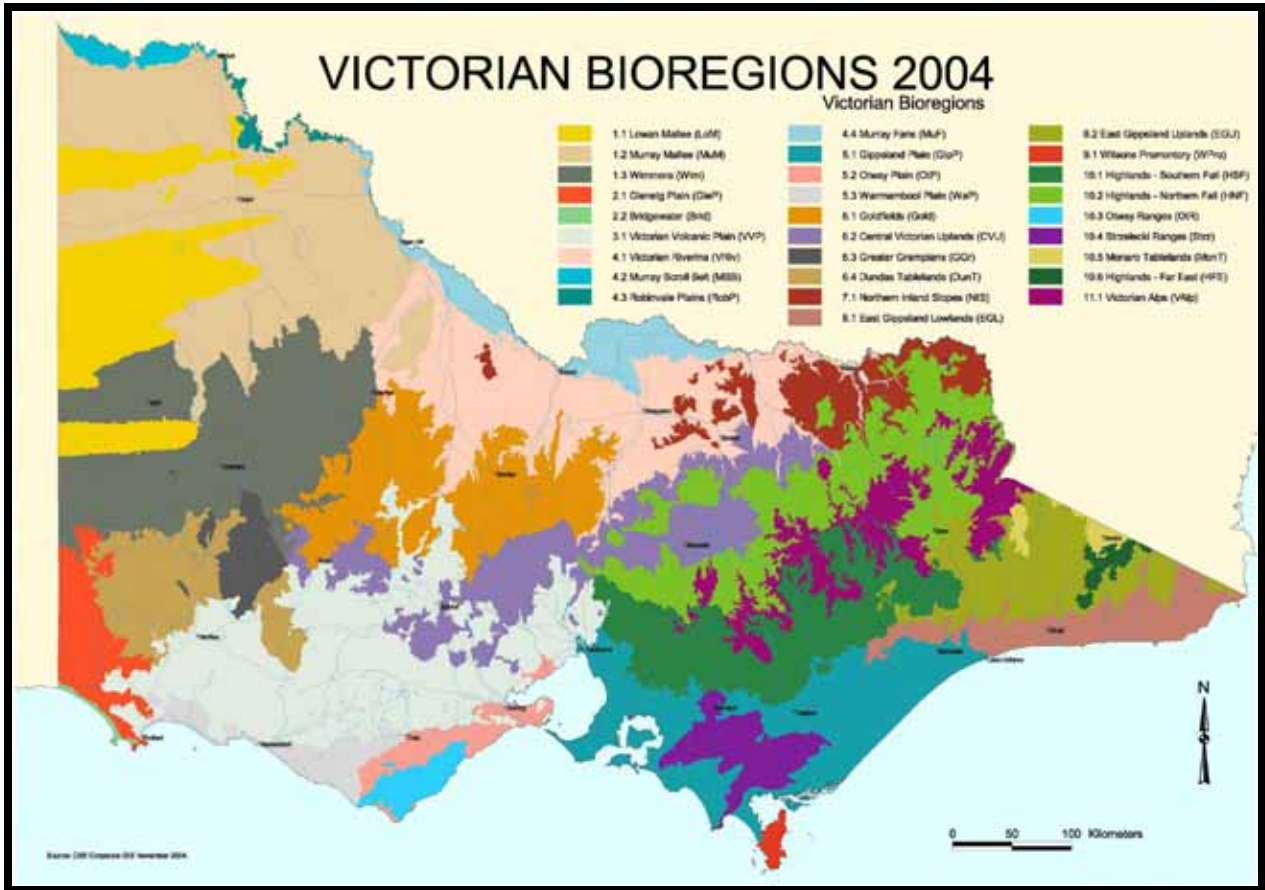


Source: Glenelg Shire

14 Glenelg Biodiversity

Map 36 highlights the three Biodiversity regions and their respective coverage in Glenelg.

Map 36 Glenelg's Biodiversity Regions



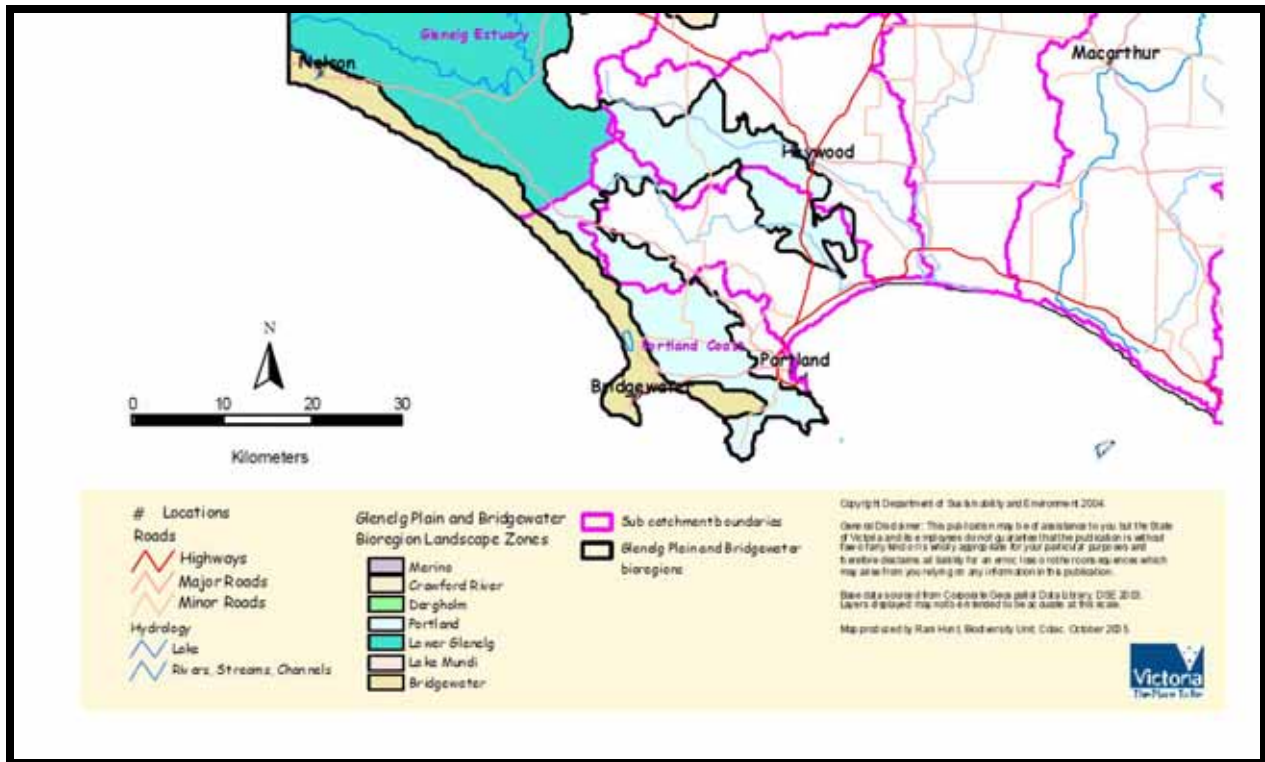
Source: Department of Sustainability and Environment

14.1 Bridgewater Bioregion

The Bridgewater zone covers 18,192 hectares and is wholly contained within the Glenelg Hopkins catchment areas. It covers the entire Bridgewater coastal area and includes the townships of Nelson and Cape Bridgewater. Over half of the native vegetation still remains within the landscape zones as it is protected within the Discovery Bay Coastal Park.

The Bridgewater bioregion as indicated by Map 37 is surrounded by the Glenelg Plain and Wimmera bioregion to the north, Dundas Tablelands to the northeast and the Victorian Volcanic Plain to the Southeast.

Map 37 Bridgewater Biodiversity Region



Source: Glenelg Shire

This zone contains important habitat for many threatened species on both private and public land.

14.2 Bridgewater Bioregional Landscape

14.2.1 Public and Private Land

Approximately 58% of the Bridgewater Bioregion is public land and over the whole of the bioregion 36% of the bioregion has been cleared of its original vegetation. Approximately 70 % of the Glenelg Plain bioregion is freehold land most of which has been cleared.

There are only approximately 13 land care or environment based groups that exist partially or wholly within the Glenelg Plain and Bridgewater bioregions.

There are no major centres within these bioregions. Currently Public land includes the Lower Glenelg National Park and the Discovery Bay Coastal Park, in addition to these assets there are 29 bush land reserves, as well as many flora and or fauna reserves.

14.2.2 Climate, Geology and Drainage

The rainfall of the bioregion is 800 to 850 mm with slightly higher rainfall closer to Portland. The region features parallel dune limestone ridges with intervening swamps and closed limestone depressions.

The geology of the bioregion is based on a thick sequence of tertiary limestones which have been overlain by basalts. In many locations these deposits have been covered by calcareous dunes and sand dune limestones. Wind and wave action has cut into both rock types, creating tall cliff faces with overhanging and deep caves. Caves have also developed at this interface and are providing valuable habitat for fauna including bats.

High steep dunes are a feature of this bioregion. In parts of this bioregion, sand has been blown up the escarpment of the Bridgewater fault and the dunes from the plateau surface may reach to four hundred feet above sea-level. They are shifting and there is a complex of encroaching dunes with steep slip faces and degrading dunes with sand removed down to the erosion pavement.

14.2.3 Landscape and Land Use

Coastal communities are composed of beach and dune vegetation, coastal cliffs and salt marshes. Wet heathlands occur on very infertile soils that are frequently waterlogged.

The dominant ecological vegetation classes for this bioregion are the calcarenite dune woodland on the dunes and deeper freshwater marshes in the low lying areas.

Table 22 Land Use in the Bridgewater Bioregion

Landuse Description	Area (HA)
None farmland (excluding remnant vegetaqtion)	10,671
Pasture – Dryland	7091
Remnant native vegetation	222
Forestry – Private Softwood	156
Unspecified non public terrestrial land	51
Total	18191

Source: Department of Sustainability and Environment

Biodiversity mapping carried out by DSE highlighted a number of biodiversity assets within this zone particularly looking at those on private land. They include Cain Flat Swamp which provides habitat for Rufus bristlebird, Swamp Antechinus, four toed Skink, Musk Duck and Swamp Greenhood. The zone also has a portion of habitat that is adjacent to Mount Richmond Nature Park that provides important habitat for Masked Owls, Broilgas, blue billed Ducks and Green sun orchids.

The Glenelg River waters are also important habitats for many native fish species including Perch, Blackfish and Glenelg Spiny Cray.

14.2.4 Implications for biodiversity conservation

Native vegetation within this bioregion has been reduced by approximately 36% of its pre -1750 extent. About 70% of the remaining remnant vegetation is contained within public land, the most significant reserve being Discovery Bay Coastal Park.

Table 23 total area of Pre 1750 and Extant EVC's in the Bridgewater Bioregion

Bioregion Conservation Status	Ecological Vegetation Class (EVC's)	Pre 1750 HA	Current Area
Vulnerable	Damp sands Herb-rich Woodland	833.1	251.1
Vulnerable	Coastal salt Marsh	26.1	23.9
Endangered	Estuarine Wetland	5.0	5.0
Vulnerable	Herb rich foothill forest	175.9	22.0
Endangered	Swamp scrub	64.6	50.1
Least Concern	Coastal dune Scrub	1663.3	1597.9
Vulnerable	Coastal Headland Scrub	181.3	152.1
Endangered	Shallow Freshwater Marsh	27.8	0.3
Vulnerable	Heathy Woodland	11.7	0.4
Endangered	Freshwater Meadow	11.4	9.8
Least Concern	Deep freshwater Marsh	1397.9	1099.1
N/A	Permanent Saline	123.6	118.1
LC	Calcarenite Dune Woodland	13429.3	8059.0
Rare	Spray zone coastal Shrub land	80.9	80.6
N/A	Water body - Natural or man made	159.9	153.1
Total		18191.8	11622.6
N/A	Plantation (undefined)	0	377
N/A	Private land No Tree cover	0	6192
Total		0	6569

Source: Department of Sustainability

Table 24 total area and number of EVC's in the Bridgewater bioregion

EVC Conservation Status	Area	Number of EVC's
Endangered	65.3	5
Vulnerable	449.2	4
Depleted	0.0	0
Rare	80.6	1
Least concern	10756.3	4
Presumed Extinct	0.0	0
Totals	11351.4	14
Not Applicable	6840.4	5

Source: Department of Sustainability

14.2.5 Priority Biodiversity Actions for the Bridgewater

1. Protect native vegetation remnants on freehold across the zone using extension, incentives and enforcement giving priority to endangered and vulnerable vegetation classes.
2. Ensure wetland habitats particularly those on private land are protected from threats such as drainage, weeds, grazing and inappropriate usage.
3. Ensure that roadside vegetation providing actual or potential linkage between public and private land remnants is protected from destructive processes or disturbance.
4. Provide a higher level of protection to remnants on private land by introducing Vegetation Protection overlays and Habitat Protection overlays in the Local Government Planning Scheme

The region is noted for its extensive and highly significant midden deposits dating back as far as 11,000 years before the present era. The Coastal Park may be the most extensive and therefore one of the most significant archeological sites on the south eastern Australian coastline.

Coastal development of the area is increasing and a number of infrastructure developments have been proposed for the area. Other significant threatening processes in the bioregion include altered water regimes, habitat fragmentation, fox and cat predation, weed invasion, inappropriate fire regimes, and lack of under storey regeneration due mainly to grazing.

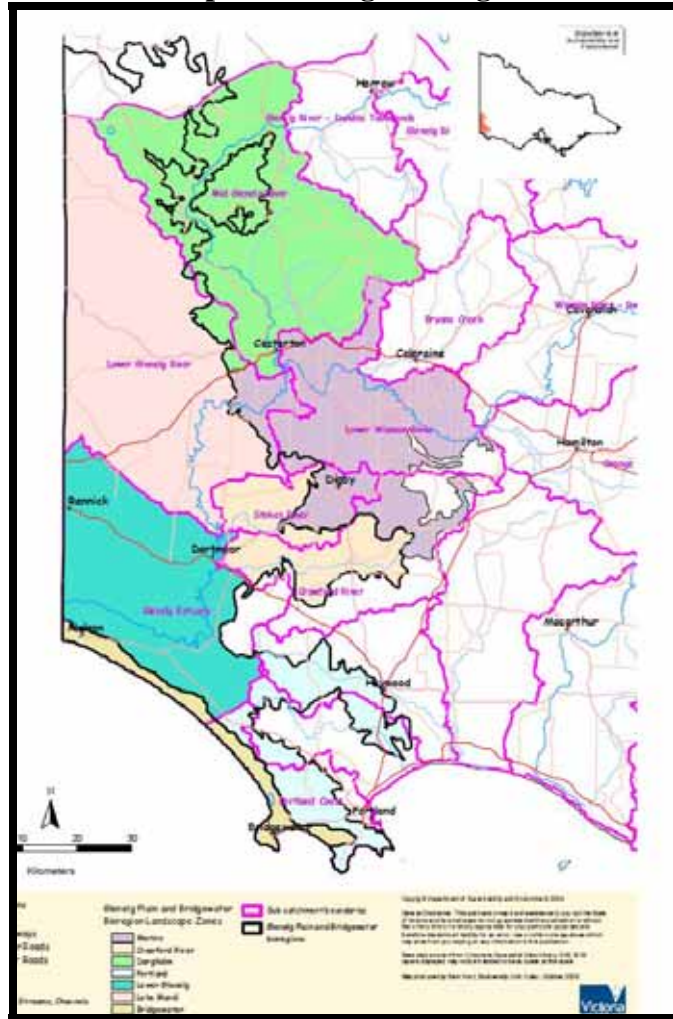
14.3 Glenelg Plain Bioregion

14.3.1 Climate, Geology and Drainage

The average annual rainfall varies across the bioregion, 600-850 mm and is greatest nearer the coast, and steadily decreases from south to north. The bioregion is predominantly flat and low lying with all sections ranging from sea level to less than 200 meters above sea level. The region features parallel dune limestone ridges with intervening swamps and closed limestone depressions.

The Glenelg River is the bioregions most significant waterway. Its listing as a Heritage River south of Dartmoor to its mouth at Nelson reflects its important biodiversity values. Several smaller rivers flow on the south eastern portion of the plain, particularly the Fitzroy and Surrey rivers, and Darlots Creek.

Map 38 Glenelg Bio Region



Source:DSE

14.3.2 Landscape and land use

Wet heathlands occur on very infertile soils that are frequently waterlogged. These health communities, up to 2 meters high, are interspersed with tree heaths, having scattered low trees. Woodlands occur through much of the region, particularly in the north.

Table 25 Land Use Glenelg Plains Bioregion

Land Use Description	Area (HA)
Pasture – Dryland	210,169
Non farmland (Excluding remnant vegetation) *+	164,692
Remnant native vegetation	25,177
Forestry –Private Softwood	11,511
Forestry –Public softwood	2,770
Other private land (non farmland)	134
Unspecified private land	130
Unspecified non public terrestrial land	63
Total	414,646

* These Landuse categories also include hardwood timber plantations

+ These Landuse categories include parks, forests and crown land

Source: Department of Sustainability and Environment

14.3.3 Implications for Biodiversity Conservation

Native vegetation cover today has been reduced to less than 40% of its pre 1750 extent in the bioregion. The current situation is a mosaic of moderate to large sized blocks on public land, scattered remnants on freehold and a network of road reserve and creek lines supporting mainly linear vegetation patches with high variable levels of connectivity. Large expanses of the bioregion have been cleared for agriculture, often in the areas with fertile soil. Approximately 30 per cent of the remaining native vegetation is reserved within Crown Land. Significant reserves include Lower Glenelg and Mount Richmond National Parks, Dergholm State Park Cape Nelson State Park and Crawford River Regional Park.

The most extensive wetland area in the region is the Strathdownie area, which has been subject to intense drainage altering flow regimes resulting in detrimental management leading to a reduction in biodiversity. Drainage of shallow wetlands continues through the bioregion, with sites usually being planted to exotic pasture species once drained. As a result native marsh and riparian vegetation and dependent species are becoming depleted throughout the area. There is an increase in centre pivot irrigation systems in the northern section of the bioregion.

The rivers and the streams of the bioregion have generally been modified, largely as a result of altered flow regimes in the upper catchment and artificial river mouth opening and the loss and degradation of riparian and fringing vegetation, leading to stream bank erosion and increased sedimentation. Sedimentation within the streams of the bioregion has been intensified by the level or erosion and sand movement coming from upstream in the Dundas Tablelands bioregion. The introduction of exotic fish has added to predation pressure and competition for some native species, while reduced flows and less frequent flooding has affected the life cycle of some aquatic species.

Habitat fragmentation and domestic grazing have further degraded natural ecosystems. Grassland ecosystems have been subject to cultivation for crops and heavily exploited for grazing. Inappropriate fire regimes, applications of sprays and fertilizers, and invasion by weeds have been further degrading factors

Plantations are a big industry within this bioregion and the area is part of the Green Triangle for Regional Plantations. These Plantations can pose a threat to biodiversity with the spread of pine wildings to adjoining areas.

Native vegetation covers only 37% of the Glenelg Plain bioregion. Modeling of pre 1750 native vegetation indicates 91 different ecological vegetation classes would have been present in the Glenelg Plain Bioregion.

Table 26 total area of pre 1750 EVC's in the Lower Glenelg Bioregion

Bioregion Conservation Status	Ecological Vegetation Class (EVC's)	Pre 1750 HA	Current Area
Vulnerable	Damp Sands Herb rich	46723.5	9720.2
Vulnerable	Damp sands / Damp Heathy Woodland	17250.7	1153.3
Endangered	Plains Grassy Woodland	6573.4	59.8
Vulnerable	Damp Sands Her-rich / Heathy Woodland	4468.9	984.8
Least Concern	Heathy Woodland	4374.7	3362.3
Vulnerable	Heathy Woodland	3465.7	2631.9
Vulnerable	Heathy woodland; Limestone Woodland	2823.6	2821.0
Least Concern	Wet Heathland / Heathy Woodland	2715.6	2338.6
Least Concern	Wet Heathland	2222.3	2101.1
Endangered	Swamp Scrub	1516.9	307.9
Depleted	Herb rich Heathy Woodland	1023.8	961.7
Vulnerable	Damp sands Herb Rich woodland / Heathy Woodland/ Sand Heathland	1008.2	4082.8
Endangered	Red Gum Wetland	912	10.4
Endangered	Freshwater Meadow	680.2	84.6
Vulnerable	Heathy Woodland	595.7	179.2
Depleted	Damp Heathy Woodland	542.5	403.2
Endangered	Shallow freshwater Marsh	467.1	83.3
Vulnerable	Damp Sands Her rich	416.7	398.5
Vulnerable	Riparian Woodland	358.7	256.9
Rare	Sand Heathland	356.4	355.8

Endangered	Escarpment Scrubland	275.1	122.4
Vulnerable	Herb-rich foothill forest	272.2	90.1
Endangered	Plains Grassy Woodland	271.4	7.9
Depleted	Riparian Scrub	263.9	263.8
Endangered	Aquatic Herb land	181.5	0.8
Vulnerable	Sedge Wetland	165.7	45.1
Endangered	Escarpment Shrub land	155.9	272.4
Vulnerable	Limestone rise Grassland	98.3	90.2
Endangered	Deep Freshwater Marsh	98.1	10.3
Deleted	Damp Heathland	76.6	33.9
Vulnerable	Limestone Woodland	72.2	72.2
Endangered	Escarpment Shrub land	58.2	29.1
Endangered	Calcarenite Dune Woodland	44.3	40.0
N/A	Permanent Saline	35.5	34.5
LC	Lowland Forest	16.9	16.9
Vulnerable	Floodplain Riparian Woodland	13.0	11.9
N/A	Water Body – Natural or man made	10.2	4.6
Least Concern	Wet Forest	9.7	9.7
Vulnerable	Limestone Pomaderris Scrubland	4.4	4.4
Total		100,620	33,457.56
N/A	Plantation	0	23,976.1
N/A	Private Land No Tree Cover	0	43,1186.3

14.3.4 Priority Biodiversity Actions for Glenelg Plains Bioregion

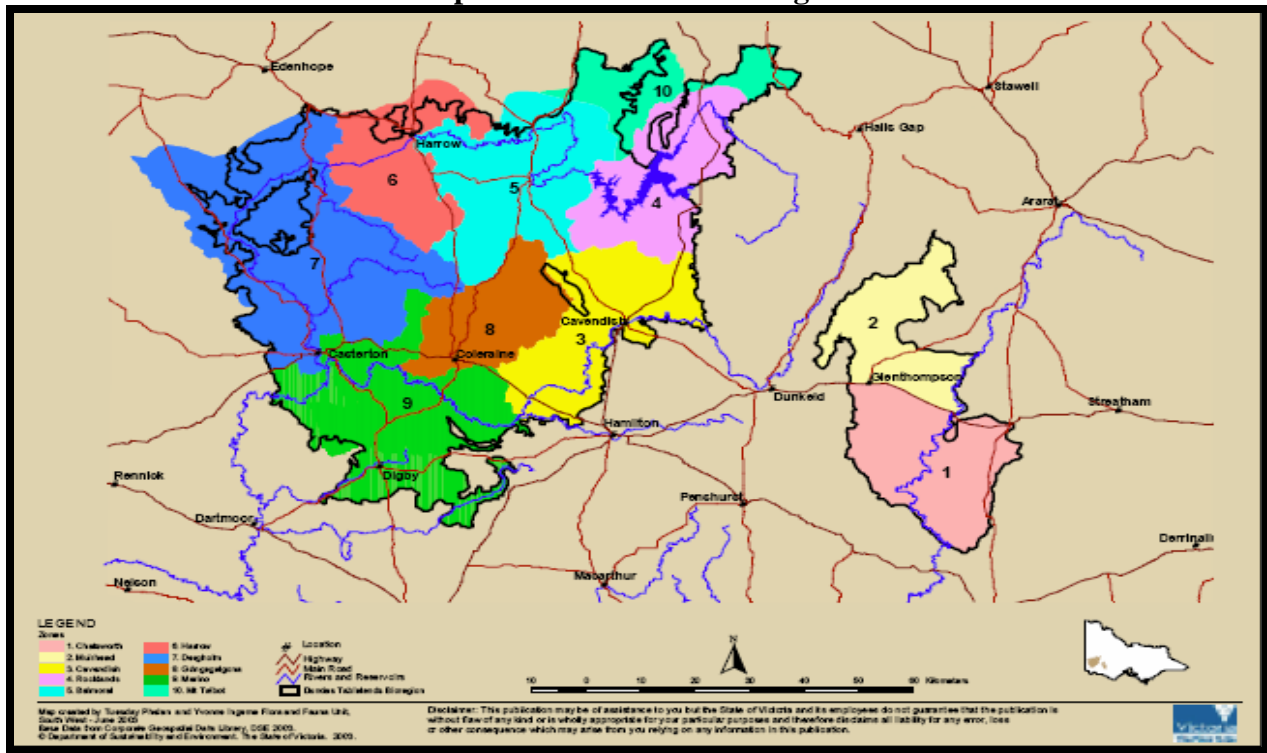
- Protect native vegetation remnants on freehold across the zone, using extension, incentives and enforcement giving priority to endangered and vulnerable ecological vegetation classes.
- Emphasize the need to protect and manage riparian vegetation along rivers creeks and drainage lines on freehold especially where these now persist as the sole or main landscape components connecting remnants.
- Ensure that all stream frontages containing native remnants are protected from domestic grazing, weed invasion, erosion and other disturbance, giving particular attention to sites having connectivity with native remnants on adjoining tenures.

- Undertake a roadside conservation plan including assessments of roadside vegetation.
- Manage remnant habitats to benefit threatened flora and fauna
- Ensure that wetland habitats particularly those on private land tenure are protected from threats such as drainage, weeds grazing and inappropriate usage.
- Ensure that restoration and revegetation of lineages and blocks of vegetation are based on pre 1750 Ecological Vegetation Classes.

14.4 Dundas Tableland Bioregion

The Dundas Tablelands bioregion is broken up into two distinct areas and covers over half a million hectares, extending over seven local government areas and two catchment management regions. The western area stretches from Dergholm in the north-west to the Grampians in the east, and south to approximately Condah. The eastern area extends from Hexham in the south to Moyston in the north, with the Grampians making up part of its western boundary. Most of the bioregion is private land dominated by agriculture. There are large areas of public land in adjoining bioregions, mainly in the Greater Grampians and Glenelg Plain bioregions. Only 10 per cent of native vegetation in the Dundas Tablelands bioregion remains, and less than 2 per cent is in formal reserves. However, the bioregion still contains small remnants of most of its pre-1750 vegetation types. Surprisingly, no species of flora and fauna are listed as extinct, but of the remaining species, 154 are considered to have a “threat” status, which includes 67 plants, 11 mammals, 57 birds, 8 reptiles/amphibians, 7 fish and 4 Invertebrates. Map 39 indicates the extent of the Dundas Tableland bioregion.

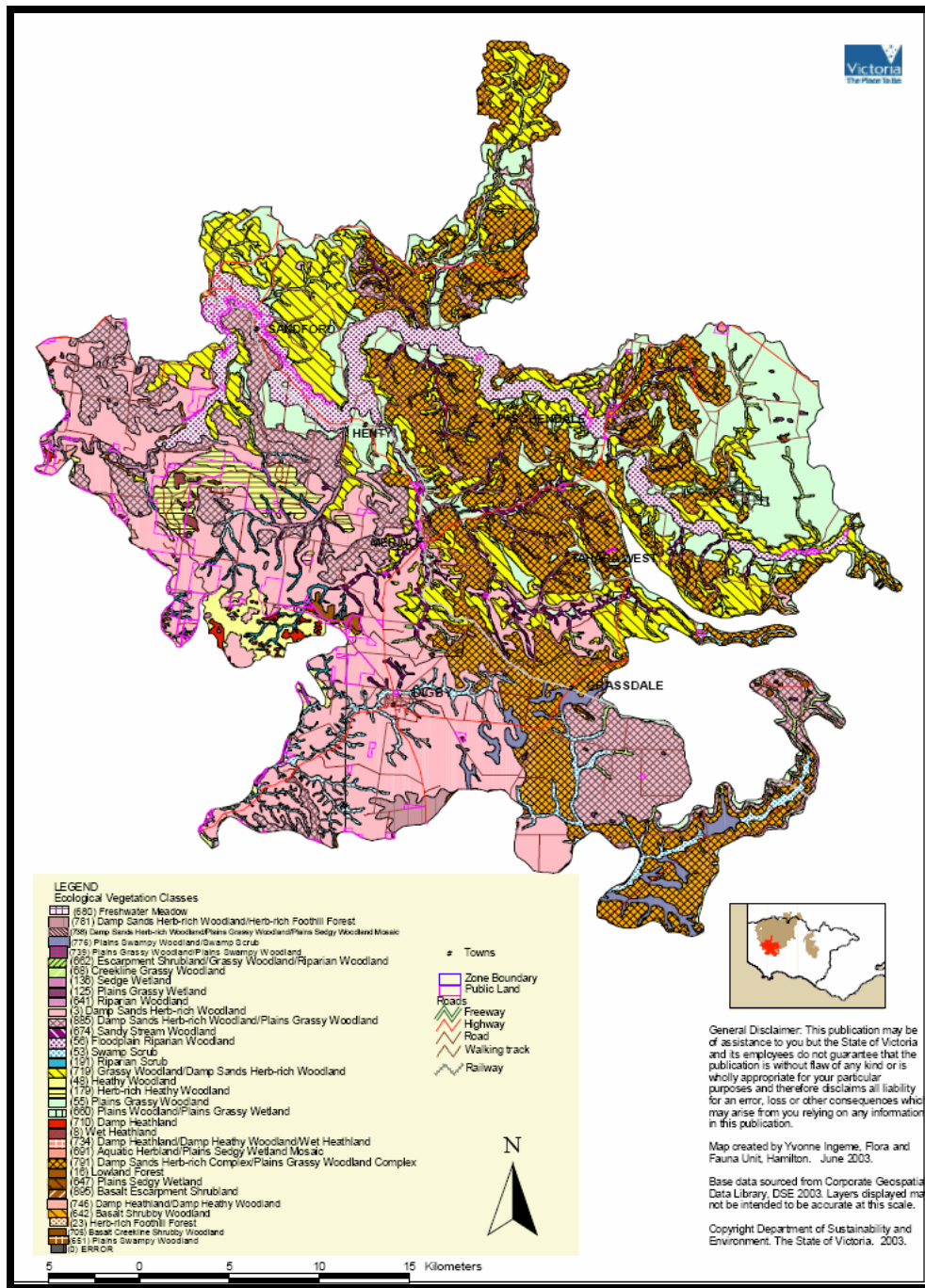
Map 39 Dundas Table Bioregion



Source: Department of Sustainability and Environment

Map 40 highlights the Merino zone in the bioregion. This zone is partly bounded to the south by the bioregional borders of Glenelg Plain and Volcanic Plain respectively. In the north it extends approximately from Casterton to approximately Konongwootong and in the south extends almost to Digby. The townships within the zone include Merino, Henty and Sandford. The major waterways within the zone include the Wannon River and Bryans Creek

Map 40 Merino Zone of the Dundas Tableland Bioregion



Source: Department of Sustainability and Environment

14.4.1 Public and Private Land

Ninety per cent of the Dundas Tablelands bioregion is privately owned and agriculture in the form of grazing and cropping is the dominant landuse.

Although no major parks or reserves occur within the bioregion (NRE 1997), some parks and reserves exist that are inliers from other bioregions. These include the Dundas Range State Park and the Black Range State Park of the Greater Grampians bioregion, and the Dergholm State Park, which is part of the Glenelg Plain bioregion. Other major areas of public land include Woohlpooer State Forest and other areas of Plains Grassy Woodland in the north-east around Rocklands Reservoir, and scattered pockets adjoining the Glenelg River near Balmoral. Cobra Killuc Wildlife Reserve near Hexham is also a large area of public land in the south-east corner of the bioregion and includes a recent addition of further land on the eastern border. Both contain significant grassland areas.

14.4.2 Climate, Geology and Drainage

Climate

Average annual rainfall ranges from 600-750 mm varying across the landscape. The rainfall pattern is affected by the Dundas Tablelands, and the Dundas, Black and Victoria Ranges. Most of the rainfall is during winter and spring (LCC 1978). There are three main rivers within the bioregion. The Glenelg River runs in the north and west, the Wannon River runs along the south-eastern boundary of the western area of the bioregion and the Hopkins River runs through the eastern section of the bioregion. Major towns and settlements in the bioregion include Hamilton, Casterton, Coleraine, Cavendish, Balmoral, Harrow and Merino

Geology

Land systems or land management units of the Dundas Tablelands bioregion include Dundas Tablelands East and West (also referred to as the Laterised Tablelands), the Merino Tablelands, and parts of the Northern Alluvial Plains, Sedimentary Rises and Granite (GSF 1993). The western part of the bioregion is deeply dissected by streams and has a characteristic landscape of steep valleys falling away from uniformly flat remnants of the plateau. The south-western corner of the bioregion, often referred to as the Merino Tablelands land system, is formed from soft, easily eroded Lower Cretaceous sediments, creating a landscape of rounded hills and ridges (LCC 1978). The eastern portion of the bioregion largely consists of unconsolidated alluvial sediments that form a flat to slightly undulating plain. Drainage on this plain is restricted, which has led to the development of extensive lake and wetland systems, and caused waterlogging of soils (GSF 1993).

The underlying geology of the zone consists of tertiary laterite capping soft calcareous Mesozoic sediments, although little of the original laterised plateau surface remains. The soft underlying rocks have eroded forming long, steep convex slopes that are susceptible to mass soil movements usually in the form of landslips. The pre-1750 vegetation of the zone was dominated by Plains Grassy Woodland, Plains Swampy Woodland, Damp Sands Herb-rich Woodland, Grassy Woodland/Damp Sands Herb-rich Woodland. Creekline Grassy Woodland and Floodplain

Riparian Woodland dominated the waterways. Conservation of biodiversity is formally recognised at international, national, and local level.

Drainage

Six major river systems pass through the Dundas Tablelands. These have been assessed for their biophysical condition. Three rivers had sections of their reaches scoring 'good' or 'excellent' condition although this was a relatively low percentage overall. Most of the reaches that rated as marginal or poor have been disturbed by siltation from accelerated erosion, nutrient run-off from agricultural land, grazing and altered hydrological regimes due to the diversion of water out of Rocklands Reservoir in the upper Glenelg catchment.

Rivers, streams and wetlands in the bioregion have generally been modified, largely as a result of altered flow regimes and the loss and degradation of riparian and fringing vegetation, leading to stream bank erosion and increased sedimentation. Erosion in the landscape and sedimentation within streams has been intensified by the slope, soil type, extensive clearing of vegetation and rabbit infestations that occurred last century. Most banks have been denuded of native vegetation, and other than old red-gums, introduced pasture grasses have largely replaced the ground flora. Willows and Tamarisk are also present along a number of waterways. Many of the waterways are unfenced and subject to grazing by domestic stock.

The introduction of exotic fish has impacted on native species through predation and competition and reduced flows and infrequent flooding has also affected the ecology of some aquatic species

14.4.3 Landscape and Land Use

Native vegetation now covers around 10 per cent of the Dundas Tablelands bioregion. Modelling of pre-1750 native vegetation indicates that 75 different EVC's would have been present. Sixty-three of these have been identified in extant native vegetation, twelve are listed as extinct and 54 have been identified as high priority EVCs within the bioregion. About 39 per cent of the extant area of native vegetation in the bioregion is endangered, 22 percent vulnerable and 3 per cent depleted.

No species of flora and fauna have been recorded as extinct in the bioregion. However, of the species present, 78 are considered threatened, including 26 plants, 5 mammals, 36 birds, 5 reptiles / amphibians, 4 fish and 2 invertebrate. Six percent of all threatened species in Victoria have been recorded in the bioregion (Parks Victoria 2001). Table 27 highlights the total area of ecological vegetation in the Merino zone.

Table 27 Total area of Pre 1750 and Extant EVC' in Merino zone

Bioregion Conservation Status	Ecological Vegetation Class (EVC's)	Pre 1750 HA	Current Area
Vulnerable	Damp Sands Herb-rich Woodland	23087	4281
Endangered	Damp Sands Herb-rich Woodland / Plains grassy Woodlands Complex	22447	88
Endangered	Plains Grassy Woodlands	15137	20
Endangered	Grassy Woodland / Damp Sands Herb-rich woodland Mosaic	14352	155
Endangered	Damps Sands Herb rich woodland ' plains grassy woodland mosaic	11679	167
Vulnerable	Floodplain riparian woodland	5326	341
Endangered	Creekline grassy woodland	2901	31
Endangered	Sandy Stream Woodland	2861	29
Endangered	Swamp scrub	2810	287
Depleted	Herb-rich Heathy woodland	2142	1455
Endangered	Plains Swampy woodland / Swamp Scrub mosaic	1276	1
Endangered	Riparian Scrub	582	335
Vulnerable	Damp Sands herb rich woodland / herb rich foothill forestry mosaic	553	71
Endangered	Riparian woodland	552	119
Least Concern	Heathy Woodland	387	932
Least Concern	Lowland forest	280	137
Endangered	Plains Woodland / Plains grassy Wetlands Mosaic	183	0
Endangered	Basalt Escarpment Shrubland	179	48
Depleted	Wet Heathland	148	88
Endangered	Plains Sedgy Wetland	128	13
Vulnerable	Damp Heathland / Damp Heathy Woodland Mosaic	80	27
X	Plains grassy Wetland	70	5
Vulnerable	Damp Heathland / damp Heathy Woodland	61	54
Vulnerable	Damp heathland	50	162
Endangered	Aquatic Herb land / Plains Sedgy Wetland Mosaic	36	5
Endangered	Plains swampy Woodland	34	
Endangered	Damp sands Herb rich woodland	17	17
X	Basalt shrubby woodland	15	0
Endangered	Sedge Wetland	13	6
Endangered	Plains grassy Woodland	9	0
Depleted	Herb-rich foothill forest	7	0
Least Concern	Heathy Woodland	5	3
Endangered	Freshwater meadow	23	1
Endangered	Escarpment Shrubland	2	0
	Total	107411	8878
	Private Tree cover	0	98112

Source: Department of Environment and Sustainability

14.4.4 Implications for biodiversity conservation

Major environmental issues in Dundas Tablelands bioregion (after Davidson 1996) Include:

- Degradation of drainage lines and riparian vegetation;
- Loss of floristic diversity;
- Loss of soil;
- Loss of mature and hollow-bearing trees;
- Fragmentation of habitats;
- Clearing of remnant vegetation; (particularly clearance of roadside vegetation for fence reconstruction)
- Weed invasion;
- Saline discharge;
- Removal of fallen logs and litter for firewood and tidiness;
- Lack of shrub and tree regeneration;
- Isolation of remnant blocks;
- Siltation;
- Cinnamon Fungus; and
- Dieback of remnant trees

Salinity is a recognized problem across the Dundas Tablelands bioregion, with the main impact being high salt loads in the Glenelg River System (GSF 1993). These high salt loads in river systems not only affect the in-stream habitat, but rising ground water and resulting salinity may severely impact on riparian remnant vegetation, which form some of the last remaining corridors and links within the Dundas Tablelands. In the eastern part of the bioregion, salinity is widespread and severe and principally develops around lake margins and other low-lying areas (GSF 1993). This major threat is beginning to be addressed on a catchment scale through re-vegetation and appropriate changes in land use practices

14.4.5 Priority biodiversity Actions for Merino Landscape Zone

Very little native vegetation remains in this zone. The focus of biodiversity management should be therefore to:

1. Protect, enhance, enlarge and link smaller remnants of threatened EVC's on public and private land by encouraging natural regeneration of trees and enhancing with understorey and ground cover species.
2. Enhance and increase the volume of understorey vegetation within the Public land blocks, particularly the retention of fallen logs.
3. Protect, enhance and restore riverine corridors especially for the Wannon River. Trees and shrubs should be planted close to the edge of the water to achieve maximum benefits of shading the water and reducing the temperature. Care must be taken to prevent destruction of native grassland or other significant habitats.
4. Encourage regeneration of red gums
5. Protect and enhance understorey vegetation, including the retention of fallen logs and branches at the base of trees, this is important habitat for species including Fat-tailed Dunnarts and Bush Stone-curlews.
6. Increase the breeding success of ground-dwelling native animals and water birds, by encouraging landholders to continue to control foxes and cats

7. Protect significant roadside vegetation, particularly native grassland and grassy woodland remnants, which continue to be threatened with destruction, especially from broadacre ploughing and herbicide spraying.
8. Develop and implement improved management techniques for the management of native grasslands and grassy woodlands to achieve improved biodiversity outcomes as well as improved pasture management.
9. Implement relevant action statements and recovery plans for threatened species and communities on public and private land.

15 Current Victorian Planning Framework

15.1 Planning in Rural Areas

15.1.1 Introduction

In 2004 the Victorian Government introduced a suite of new rural zones to be applied in planning schemes to replace the previous rural land use zones being applied across nonurban areas of the State. The purposes of these new zones are to:

- *Recognise the State, regional and local importance of farming as an industry and provide greater protection for productive agricultural land;*
- *Provide a wider choice of zones with clear purposes and controls to match;*
- *Discourage ad hoc and incompatible use and development;*
- *Recognise the changing nature of farming and reduce potential for conflict between farming and other, more sensitive, land uses;*
- *Recognise that rural areas are places where people live and work;*
- *Recognise and protect rural areas that are environmentally sensitive*

15.2 Planning

This section will provide a brief introduction to the objectives and structure of the Victorian Planning regime.

The objectives of planning in Victoria are defined in Section 4(1) of Victoria's *Planning and Environment Act 1987* and all planning decisions must demonstrate compliance with the objectives on balance. They are as follows:

1. To provide for the fair, orderly, economic and sustainable use and development of land
2. To provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity
3. To secure a pleasant, efficient and safe working living, and recreational environment for all Victorians and visitors to Victoria

4. To conserve and enhance those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest or otherwise of special cultural value
5. To protect public utilities and other assets and enable the orderly provision and coordination of public utilities and other facilities for the benefit of the community
6. To facilitate development in accordance with the objectives set out in the points above
7. To balance the present and future interests of all Victorians

The Glenelg Planning scheme must comply with the seven annunciated planning objectives for Victoria. The seven objectives are administrated through a hierarchical planning structure which is based on the Planning and Environment Act. In addition to the Planning and Environment Act there are other elements that provide structure to the Victorian planning framework. These additional elements include:

- The Victoria Planning Provisions (VPP).
- Ministerial Directions - These provide specific direction on a select range of matters deemed to be of importance to planning in the State.
- Local Government Planning Schemes (i.e.: Moyne Planning Scheme).
- Various state, regional, and local level strategies

In brief, the *Planning and Environment Act 1987* sets the ‘big picture’ rules, and the VPP provides government policy that sits below the Act. Planning schemes implement the Act and the VPP and establish a local framework for orderly local land use planning and development control. Amendments to the local planning scheme (i.e. changing the local interpretation and application of the Act and the VPP) require endorsement of the Minister for Planning. They can occur only where the amendment has been soundly and strategically justified and should be developed as a result of a systematic strategic review that enables the merit of the proposed changes to be assessed against the *Planning and Environment Act 1987*, the VPP, and the existing planning scheme.

To change the existing zoning of a parcel from one zone to another any rezoning proposal must comply with various with Ministerial *Directions* and State *Planning Practice Notes*. For Glenelg Shire a key Ministerial Direction is Number 6 which deals with *Rural Residential Development* and its associated practice note entitled *Rural Residential Development Guidelines* released in October 2006. This practice note is particularly relevant to this project considering the large volume of rural land in the shire. This practice note applies to any planning scheme amendment that provides for:

- The rezoning of land to the Low Density Residential zone or Rural Living Zone
- Introduction of a lot size less than 8 hectares to the schedule to the Farming Zone, Rural Activity Zone, Rural Conservation Zone, or Rural Zone

For rural residential development to occur in any rural zone Glenelg Shire has to demonstrate to the Department of Planning and Community Development: the following:

- The proposed development is consistent with the housing needs and settlement strategy of the area
- The proposed development is supported by and supports sustainable and viable settlements and communities
- The proposed development does not compromise the sustainable future use of existing natural resources, including productive agricultural land, water and mineral energy resources
- The proposed development protects existing visual and environmental qualities of the area such as landscape, water quality, native vegetation, habitat and biodiversity
- The proposed development avoids predictable adverse environmental processes and defects such as flooding, erosion, land slip, salinity or wildfire
- The proposed development can efficiently be serviced by social and physical infrastructure, at an acceptable and sustainable community cost.

Planning practice notes are another element in the Victorian Planning hierarchy. They cover specific applications of the Victorian Planning Provisions. The Planning Practice Notes particularly relevant to this project are listed below.

15.2.1 Rural

- *Timber Production in Rural Areas (1999)*
- *New Zones for Rural Victoria (Advisory Note 2004)*
- *Rural Residential Development Guidelines (2006)*
- *Applying the rural zones (2007)*

15.2.2 Biodiversity

- *Biodiversity (2002)*
- *New exemptions for native vegetation removal in planning schemes (2008)*
- *Managing native vegetation in the planning system (2008)*
- *Preparing a native vegetation precinct plan (2008)*
- *Native vegetation offsets (2008)*

15.2.3 Flooding

- *Applying the flood provisions in planning schemes – a guide to Councils (2000)*

Another mechanism in the Glenelg planning hierarchy is overlays. Overlays are designed to protect identified values (e.g. Heritage, environmental, landscape) or hazards (e.g.: flooding,

bushfire, erosion or landslip) in designated areas. They do not have a role in setting land use, but trigger the need for caution in considering developments on land where an Overlay is applied. Where used, Council must consider the reason for an Overlay and its implications in any planning decision. This could for example result in a need to locate the development in a different location other than that being proposed. Decisions should not cause deleterious impacts on the values protected by the Overlays.

There are four overlays of particular relevance to this project. For natural environmental / ecological reasons these are as identified in Table 2 as the ESO, the Heritage Overlay, Development Plan overlays and the Wildfire Management Overlay.

Table 28 Overlays impacting on Glenelg

Overlay	Objectives
Environment Significance Overaly (ESO)	<ul style="list-style-type: none"> • To identify areas where the development of land may be affected by environmental constraints • To ensure that development is compatible with indentified environmental values
Heritage Overlays	<ul style="list-style-type: none"> • To conserve and enhance heritage places of natural or cultural significance • To conserve and enhance those elements which contribute to the significance of heritage places • To ensure that development does not adversely affect the significance of heritage places • To conserve specifically identified heritage places by allowing a use that would otherwise be prohibited if this will demonstrably assist with the conservation of the significance of the heritage place.
Development Plan Overlays	<ul style="list-style-type: none"> • To identify areas which require the form and conditions of future use and development to be shown on a development plan before a permit can be granted to use or develop the land
Wildfire Management Overlays	<ul style="list-style-type: none"> • To identify areas where the intensity of wildfire is significant and likely to pose a threat to life and property • To ensure that development which is likely to increase the number of people in the overlay area: <ul style="list-style-type: none"> ○ Satisfies the specified fire protection objectives ○ Does not significantly increase the threat to life and surrounding property from wildfire

Section 2 Individual Planning Analysis

16 Business Zones

Glenelg has two business zones, B1Z and B4Z. Each zone has specific uses which are allowed.

16.1 Rational for Business 1 Zone Inclusion in the Study

The retail / wholesale sector value to the Glenelg economy is worth in excess of \$100 million per annum in Glenelg Shire (ABS). The Business 1 Zone is the main area for the generation of this revenue. Retailing / wholesale is a major industry in Glenelg with 186 individual retail and 72 wholesale businesses operating in the shire. The combined employment in this sector represents in excess of 600 jobs.

16.2 B1 Zone

16.2.1 Purpose

The purpose of the Business 1 Zone (B1Z) is to encourage the intensive development of business centres for retailing and other complementary commercial, entertainment and community uses. Portland, Casterton and Heywood each have B1Z zoning. Table 20 indicates that there are 656 parcels in the Portland, Casterton and Heywood that have B1Z zoning. Table 21 shows that of the 544 parcels (82.9%) of the 656 parcels have an area of 0.1 of a hectare or less in size.

Table 29 B1Z Parcels in Glenelg by Location

		locality			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CASTERTON	137	20.9	20.9	20.9
	HEYWOOD	66	10.1	10.1	30.9
	PORTLAND	453	69.1	69.1	100.0
	Total	656	100.0	100.0	

Source: Glenelg Shire

Table 30 B1Z parcel area

parcelarea_ha * locality Crosstabulation

		locality			Total
		CASTERTON	HEYWOOD	PORTLAND	
parcelarea_ha	.00	4	1	18	23
	.10	107	52	385	544
	.20	23	8	43	74
	.50	3	5	5	13
	1.00	0	0	2	2
	Total	137	66	453	656

Source: Glenelg Shire

16.3 Land use

A key to understanding how the well the zone is working in regulating the planning environment is to examine the number of different classifications of the specific zone. There are 17 separate categories in the Glenelg B1 zone.

Casterton has 5 classes

C commercial/ industrial built i.e. where a building has been built on the parcel;

C comm. / industrial land; C non rateable i.e. a parcel where a structure is built and no revenue is generated through a rating notice;

C residential built a parcel where a dwelling has been built and is used for home occupation;

C residential land a parcel where no dwelling or building has been built.

Heywood has 5 similar categories to that of Casterton

H commercial/ industrial built;

H comm. /industrial land;

H non Rateable;

H Residential land and

H residential built)

Table 31 B1Z Land use by Property Levy Description

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15	2.3	2.3	2.3
B-Recreation Built/land	1	.2	.2	2.4
C-Comm/Indust Built	98	14.9	14.9	17.4
C-Comm/Indust Land	5	.8	.8	18.1
C-Non Rateable	8	1.2	1.2	19.4
C-Residential Built	23	3.5	3.5	22.9
C-Residential Land	2	.3	.3	23.2
H-Comm/Indust Built	47	7.2	7.2	30.3
H-Comm/Indust Land	1	.2	.2	30.5
H-Non Rateable	8	1.2	1.2	31.7
H-Residential Built	5	.8	.8	32.5
H-Residential Land	2	.3	.3	32.8
P-Comm/Indust Built	283	43.1	43.1	75.9
P-Comm/Indust Land	8	1.2	1.2	77.1
P-Historical	1	.2	.2	77.3
P-Non Rateable	62	9.5	9.5	86.7
P-Recreational Built	3	.5	.5	87.2
P-Residential Built	81	12.3	12.3	99.5
P-Residential Land	3	.5	.5	100.0
Total	656	100.0	100.0	

Source: Glenelg Shire

Portland has seven categories, four categories similar to that of Casterton and Heywood

P commercial/ industrial built;

P comm. /industrial land;

P non Rateable

P residential built and two new categories

P recreational built for recreational facilities that are built within the B1Z and

P residential land vacant land within the B1Z upon which a dwelling can be built and

P historical.

16.3.1 Current Land Use Analysis

The B1Z zones contains 656 parcels which have been segmented by 6 categories of property levy codes i.e. (commercial / industrial built; non rateable; residential land; residential built; recreational built and comm. /industrial land). 428 of the 656 or 66% are classified as the commercial / industrial built category; this category represents a parcel with a commercial business facility existing on the parcel. Portland has 283 (66%) B1Z parcels with this classification followed by Casterton with 98 or 22.89% and Heywood with 47 or 10.98% respectively.

The second largest category is the residential built category with 109 parcels or 18.7% of the total B1Z parcels in Glenelg. Portland has 81 or 74.3% parcels within this classification followed by Casterton with 23 or 21.1% and Heywood with 5 or 4.5% respectively. This category represents a parcel with a residential dwelling constructed on the parcel.

The third major category is non rateable. This category has 78 parcels with Portland having 62 or 79.5% of parcels.

The two categories representing vacant land i.e. (commercial /industrial land and residential land) represent a total of 21 parcels or 3.2 % of all B1Z parcels. This category represents the current B1Z vacant land which is available for development in Glenelg.

Table 32 B 1 Property Description by Location

Levy_Desc * locality Crosstabulation

Levy_Desc	locality			Total
	CASTERTON	HEYWOOD	PORTLAND	
Levy_Desc	1	1	13	15
B-Recreation Built/land	0	1	0	1
C-Comm/Indust Built	98	0	0	98
C-Comm/Indust Land	5	0	0	5
C-Non Rateable	8	0	0	8
C-Residential Built	23	0	0	23
C-Residential Land	2	0	0	2
H-Comm/Indust Built	0	47	0	47
H-Comm/Indust Land	0	1	0	1
H-Non Rateable	0	8	0	8
H-Residential Built	0	5	0	5
H-Residential Land	0	2	0	2
P-Comm/Indust Built	0	0	283	283
P-Comm/Indust Land	0	0	8	8
P-Historical	0	0	1	1
P-Non Rateable	0	1	61	62
P-Recreational Built	0	0	3	3
P-Residential Built	0	0	81	81
P-Residential Land	0	0	3	3
Total	137	66	453	656

Source: Glenelg Shire

From 2000 to the end 2009 4817 building permits were issued across Glenelg. 215 building permits were issued for parcels zoned B1Z.

Table 33 Value of B1Z Building permits 2000-2009

Casterton			Heywood			Portland		
Year	Number	Value	Year	Number	Value	Year	Number	Value
2000	3	\$289,000	2000	3	\$331,000	2000	15	\$653,993
2001	1	\$75,100	2001	2	\$2,221,000	2001	24	\$1,417,201
2002	3	\$51,100	2002	0	\$0	2002	27	\$4,949,154
2003	0	\$0	2003	0	\$0	2003	23	\$815,420
2004	4	\$121,290	2004	0	\$0	2004	14	\$2,949,800
2005	4	\$51,126	2005	5	\$85,201	2005	12	\$503,120
2006	2	\$1,300	2006	2	\$83,400	2006	13	\$970,270
2007	6	\$275,091	2007	1	\$7,500	2007	10	\$685,038
2008	5	\$1,935,650	2008	1	\$3,133	2008	11	\$2,581,300
2009	1	\$360	2009	2	\$7,000	2009	20	\$3,492,255
Total	29	\$2,800,017		16	\$2,738,234		169	\$19,017,551

Source: Glenelg Shire

An analysis of the building permits for B1Z land over the 10 year period indicated that Casterton had on average 2.9 permits per year; Heywood 1.6 and Portland 16.9 permits per annum over the 9 year time frame.

Building permits may or may not indicate the construction of a new building. Building permits have ten classes (*class 1* houses; *class 2* flats; *class 3* motels & shared accommodation ; *class 4* caretakers; *class 5* offices; *class 6* shops including hotels ; *class 7* warehouses; *class 8* factories; *class 9* public buildings and *class 10* an overarching category that takes in sheds, fences, awnings signs etc).

The building permits for the nine year period 2000-2009 show that only 39 out of the 214 (or 18.2 %) were for actual new construction that required additional or new land. Heywood required just 3 lots, Casterton 5 lots and Portland 31 lots.

A 10 year forecast relating to future building permits was undertaken. Scenarios of 1 %, 2 %, and 3% growth per annum were used to forecast potential building permits for a ten year span from 2010 to 2020 for B1Z land.

For **Casterton** with a 1% growth rate per annum in B1Z permits, Casterton can expect to average 4.5 B1Z permits in 2020; up from the current 2.9 average recorded over the period 2000-2009. A 2% growth rate yields 6.7 permits in 2020 and a 3% growth rate yields 9 permits per year in 2020.

For **Heywood** with a 1% growth rate per annum in B1Z permits Heywood can expect to average 2.5 B1Z permits in 2020; up from the current 1.6 average recorded over the period 2000-2009. A 2% growth rate yields 3.7 permits in 2020 and a 3% growth rate yield 5.4 permits per in 2020.

For **Portland** with a 1% growth rate per annum in B1Z permits Portland can expect to average 26 B1Z permits in 2020; up from the current 16.9 average recorded over the period 2000-2009. A 2% growth rate yields 38.7 permits in 2020 and a 3% yield 57 permits in 2020.

As indicated earlier the increased number of building permits does not reflect the actual demand for additional B1Z land. A Land budget for B1Z property in Glenelg was developed for the period 2010 to 2030. 53 additional lots would be required using the current demand average of 3.9 lots per annum. As indicated by Table 34.

Table 34 B1Z Land Budget

Available B1Z Land and Demand	
Vacant B1Z lots based on property rating system	25
Building construction over 9 years (2000-2009)	39
Average lot uptake (2000-2009)	4.3
Estimated current supply of B1Z zoned land (vacant lots)	25*
Land required to provide 20 year supply at current take rate (4.3 parcels)	87
Estimated deficit of lots	53

* Extent of developable land may be significantly less than this due to development constraints

Table 35 represents a scenario of 1, 2 and 3 % growth in the requirement of additional B1Z land. The Table also highlights the additional land that would be needed to meet this requirement.

Table 35 Growth Scenarios for B1Z Zone 1%, 2%, 3%

Growth Scenarios	Average over last 9 years	Low	Medium	High
	0.66%	1%	2%	3%
Forecast Average Demand for Lots over a 10 year period	3.9	6.02	8.96	13.03
Annual land required assuming average of 10 buildings per (HA)	.5	1	9	13
Land required to provide 10 year supply (HA)	5 HA	10	90	130

(Calculation Add permits per year then total and divide by percentage of permits that are actual new buildings i.e. 1% growth Casterton 4.5 + Heywood 2.5 + Portland 26 = total 33 multiplied by 18 .2% resulting in 6.02)

Glenelg’s allocation of Business Zoning was compared to surrounding Shires to develop an index which would indicate the level of Business Zone square footage per head of population. The following regional centers were used in the analysis: Apollo Bay; Ararat; Camperdown; Casterton; Colac; Hamilton; Heywood; Horsham; Port Fairy; Portland; Terang; Torquay and Warrnambool.

The data was gathered using the Department of Planning and Community Development automated mapping system. The methodology to determine the total Business Zone area for the 13 locations included identifying and tracing each Business Zone parcel per locale and summarizing that data into a total for each location. The eleven locations have a variety of business zones ranging from B1 through to B4 (Table 36).

Table 36 Business Zoning Across S. W. Victoria

Zone	<i>Apollo Bay</i>	<i>Ararat</i>	<i>Camperdown</i>
B1	Yes	Yes	Yes
B2	Yes	Yes	N/A
B3	N/A	Yes	N/A
B4	Yes	Yes	Yes
Zone	<i>Casterton/ Heywood</i>	<i>Colac</i>	<i>Hamilton</i>
B1	Yes	Yes	Yes
B2	N/A	Yes	N/A
B3	N/A	N/A	N/A
B4	Yes	Yes	N/A
Zone	<i>Horsham</i>	<i>Port Fairy</i>	<i>Portland</i>
B1	Yes	Yes	Yes
B2	Yes	N/A	N/A
B3	Yes	N/A	N/A
B4	Yes	N/A	Yes
Zone	<i>Terang</i>	<i>Torquay</i>	<i>Warrnambool</i>
B1	Yes	Yes	Yes
B2	N/A	N/A	Yes
B3	N/A	N/A	Yes
B4	Yes	N/A	Yes

All 13 locations have the B1 zone. This zone is a general zone to encourage the intensive development of business centres for retailing and other complementary commercial, entertainment and community uses.

Glenelg (Portland, Casterton, Heywood) has only B1 and B4 categories. Table 37 indicates the square meters by business zone category by location. The Table also highlights the amount of square footage by head of population. Population data for each location was obtained through the Victorian Government's Towns in Time program. Portland has the fifth largest volume of total business area (all categories) while Casterton is eighth and Heywood eleventh out of the thirteen locations.

For B1 Portland ranks 5th with 2,443,985 Square Meters, Casterton (8th) has 777,791.7 Square Meters and Heywood (11th) 339,219.2 Square Meters. On a square meters per head of population basis Portland (ranks 9th) with 251.54 Square Meters per head of population, Casterton (ranks 6th) with 480.71 Square Meters per head and Heywood (8th) with 276.0121 Square Meters per head of population.

Table 37 B1Zone Area Compared to Population

Town	Population	Total Business Zone Area	Total Business (Square Meters) Per head of population	B1 Square Meters	B1 per head of population
Apollo Bay	1278	392,251.7	306.9262	392,251.7	306.9262
Ararat	7067	7,111,140	1006.246	6,272,771	887.6144
Camperdown	3028	2,649,012	874.8389	2,434,458	803.9822
Casterton	1618	1,392,330	860.5254	777,791.7	480.7118
Colac	10562	6,807,790	644.555	1,652,960	156.5007
Hamilton	9484	4,620,458	487.1845	4,620,458	487.1845
Heywood	1229	3,556,606	289.3902	339,218.9	276.0121
Horsham	13290	11,877,644	893.7279	6,416,469	482.8043
Port Fairy	2631	593,131	225.4394	593,131	225.4394
Portland	9716	5,762,029	593.0454	2,443,985	251.5423
Terang	1787	181,544.4	101.5917	86,248.7	48.26452
Torquay	9468	305,560.2	32.27294	305,560.2	32.27294
Warrnambool	28029	41,502,814	1480.71	39,385,352	1405.164
Total	99187	83,551,366		65,720,655	

Source:

Locations with population similar to that of Portland i.e. Hamilton, and Ararat have substantially larger total B1 areas and greater per square meter of B1 retail space per head of population. Hamilton has 487.18 square meters of retail space per head of population and Ararat has 803.98 square meters of retail space per head of population.

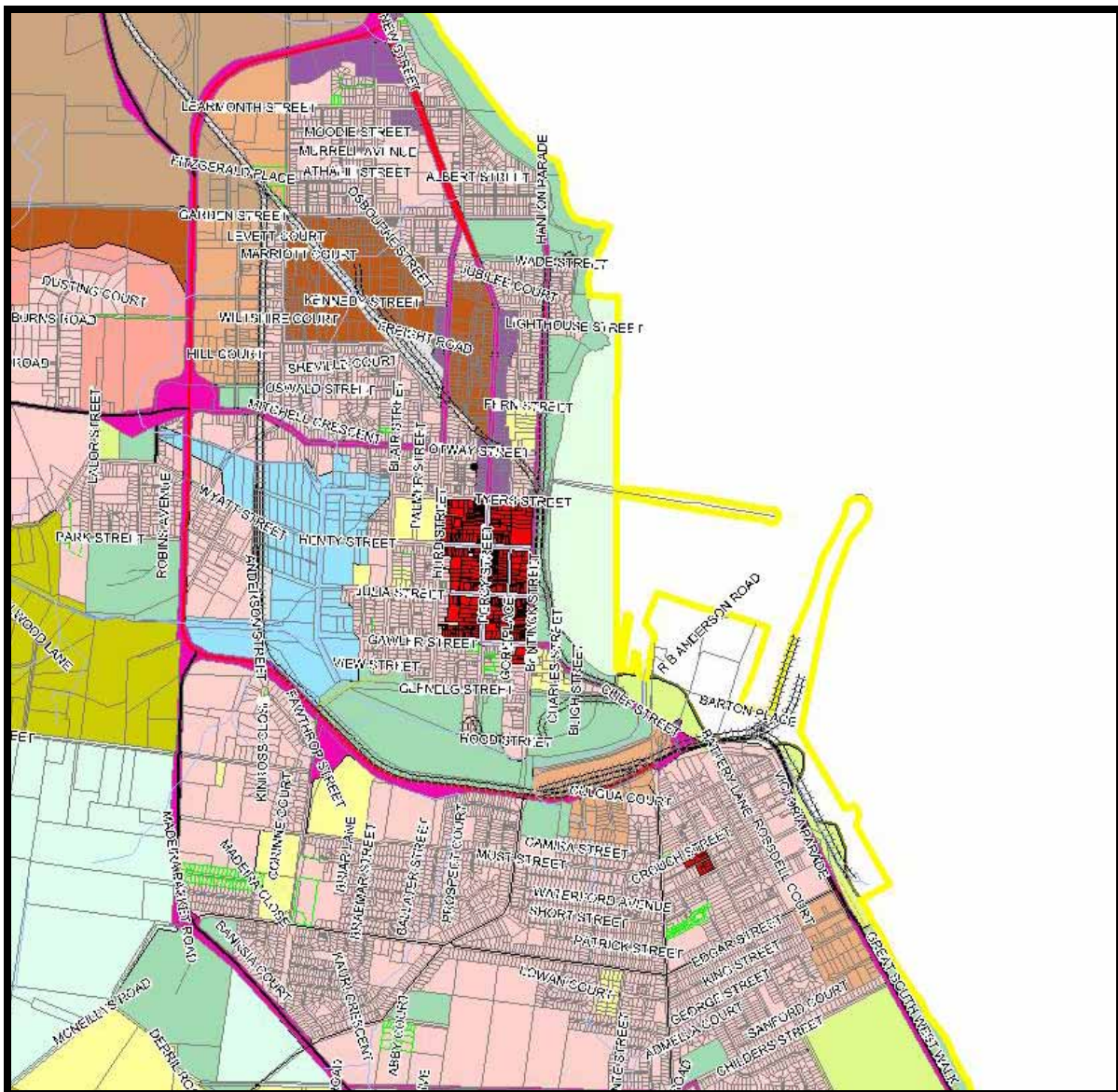
Using per head of population as the major determinant Portland has roughly the same retail allotment per resident as Port Fairy or Heywood. Portland has 3.6 times the population of Port Fairy and 7.9 times the population of Heywood. Casterton which has 18 percent of the population of Portland has on a per capita basis nearly twice as much retail space per head of population.

The results from comparing population and retail space per location indicate that Portland has a deficiency of retail floor space as compared to other centers in south west Victoria.

16.3.2 Current B1Z Portland

Portland has 453 parcels that have been identified as B1Z properties within a 5 km radius of the CBD of Portland. The vast majority of these parcels are collectively in one area. The area is bounded by Percy Street to the West, Tiers Street to the North, Gawler Street to the South and Bentinck Street to the East and is portrayed as a red area in Map 27. 385 of the 453 parcels or 84% have an area of 0.10 hectare or less. This reinforces the B1Z zoning concept of intensive business centers for retailing and other complementary, commercial, entertainment and community uses. Table 38 highlights how fragmented the B1 zone is in Portland. 81 private residences are currently situated in the zone.

Map 41 B1Z Parcels with 5 KM of Portland



Source: Glenelg Shire

Table 38 provides an overview of the B1Z zone in the Portland area. The levy code shown in the Table represents a rating code which the Shire uses to assess the level of property tax which is assessed to each property.

Table 38 Summary of B1 Zone in Portland

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	HA
B1 z	1p	Residential Land	3	0	3	0.19
	2 p	Residential built	81	81	0	4.05
	4p	Comm./Industrial Built	283	283	0	14.76
	5 P	Comm./Industrial Land	8	0	8	0.33
	11 p	Recreational Built	3	3	0	0.19
	15 P	Non Rateable	61	N/A	N/A	6.04
	17 P	Historical	13	N/A	N/A	0.31
Total			453	367	11	25.95

Source: Glenelg shire

16.3.3 Fire Proneness of the Zone

The B1 zone is not prone to bushfires.

16.3.4 Land Use Impediments

The occurrence of flooding is the only major land use impediment. As stated earlier 145 parcels would be impacted by a 1 in 10 year flood incident and 229 parcels would be impacted by a 1 in 100 year flood. Another impediment for development in the B1 zone is the historic importance and character of the CBD of Portland. Portland had a rich collection of historic buildings that represent the early beginning of Victoria. Over 100 heritage buildings are listed nationally most of which are located in the CBD of Portland.

The rationale for why a building may be considered important from an historic point of view may include:

- **Rarity**, a building or elements its comprises may be unique or highly unusual
- **Architectural quality**, a building or part of a building may contain elements of high architectural quality
- **State of preservation**, a building or part of a building may contain elements of high architectural quality
- **Historical links**, a building may have important links with past historical events or evince an important time in a particular town's development
- **Usage of local construction materials** or techniques


Grid pattern for the B1 zone area is a mixture of small narrow grained blocks which are quite deep.

Grid Pattern for the CBD

Grid pattern for the study area is a mixture of small narrow grained blocks which are quite deep.

Respective Lots sizes are:

- Bentinck 500 -1000 sqm
- Gawler 300-2000 sqm
- Glenelg 300-900 sqm
- Henty 600 -6000 sqm
- Julia 200-7000 sqm
- Percy 300 -2000 sqm



Source : Pictures M Herron

Source : Map Glenelg Shire GIS

1

16.3.5 Forecast Population over the next 20 years

The population of Glenelg is to remain stable with only a slight increase in population over the next 20 years. The one impact that will occur is that a greater percentage of the population will be over 65 years of age. This factor should not impact severely on the B1 zone.

16.3.6 Levels of Fragmentation and building utilization in the Zone

The B1 Zone has been badly fragmented with private dwellings intermingling with commercial and retail facilities. Comments from local realtors view the current stock of commercial properties as substandard as opposed to other regional centers (i.e. Hamilton and Warrnambool).

16.3.7 Subdivision Permits

For the period 2000 -2010 there were nine subdivision applications submitted for the Business 1 Zone (B1Z). Table 39 highlights the year and the respective number of subdivision permits received by Glenelg Shire.

Table 39 B1Z Subdivision permits by year

		Application Date			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	2006	2	22.2	25.0	25.0
	2008	3	33.3	37.5	62.5
	2010	3	33.3	37.5	100.0
	Total	8	88.9	100.0	
Missing	System	1	11.1		
	Total	9	100.0		

Source: Glenelg Shire

Subdivision development in the B1 zone has only occurred post 2005. This development has occurred in both Portland and Casterton as indicated in Table 40. Map 42 indicates that B1 subdivisions have occurred in two locations in Portland (1) west of Percy Street and (2) south of Julia Street.

The single subdivision in Casterton (Map43) is located between Murray Street and the Henty Street Service Road.

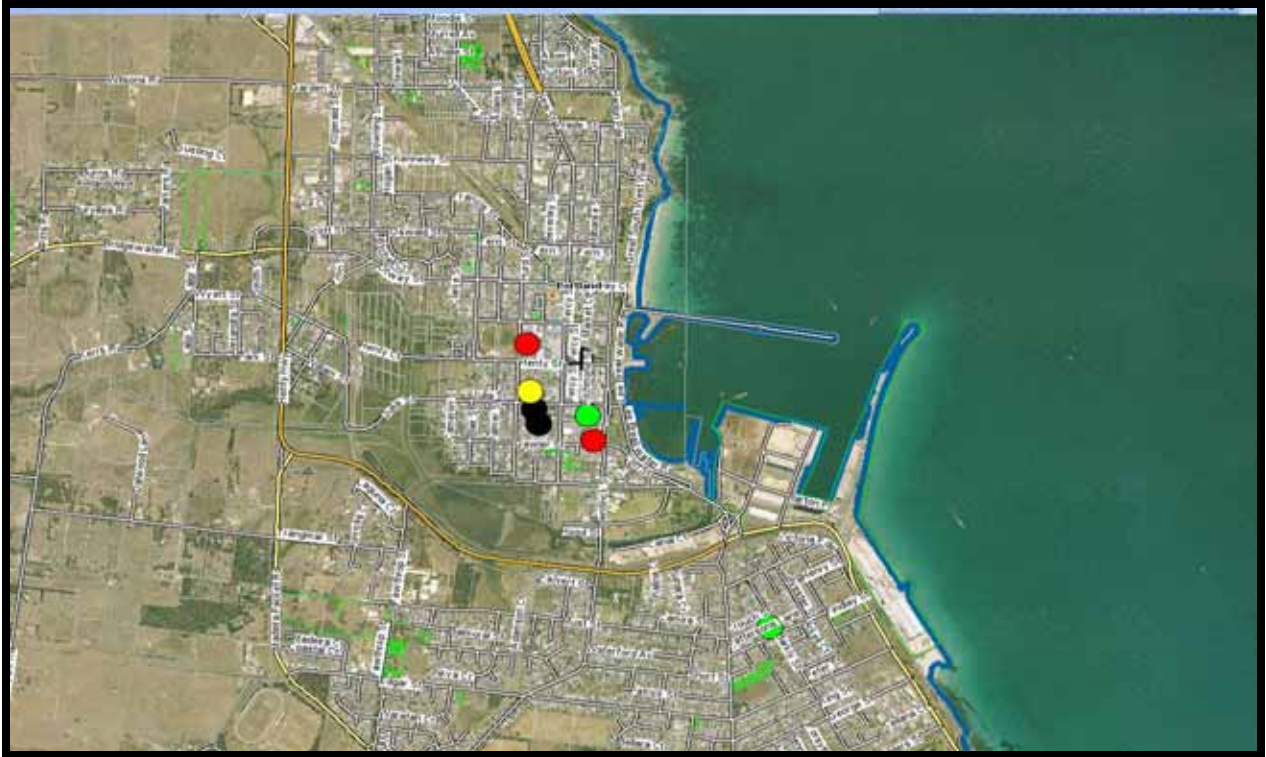
The colour keys for the respective maps are Black 2010; yellow 2009; red 2008 and light green 2006.

Table 40 B1 Development Areas

		Frequency	Percent	Valid Percent	Cumulative
					Percent
Valid	Barkly Street, Portland	1	11.1	11.1	11.1
	Gawler Street, Portland	1	11.1	11.1	22.2
	Henty Street, Casterton	1	11.1	11.1	33.3
	Henty Street, Portland	1	11.1	11.1	44.4
	Hurd St, Portland	1	11.1	11.1	55.6
	Julia St, Portland	1	11.1	11.1	66.7
	Julia Street, Portland	2	22.2	22.2	88.9
	Percy St, Portland	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

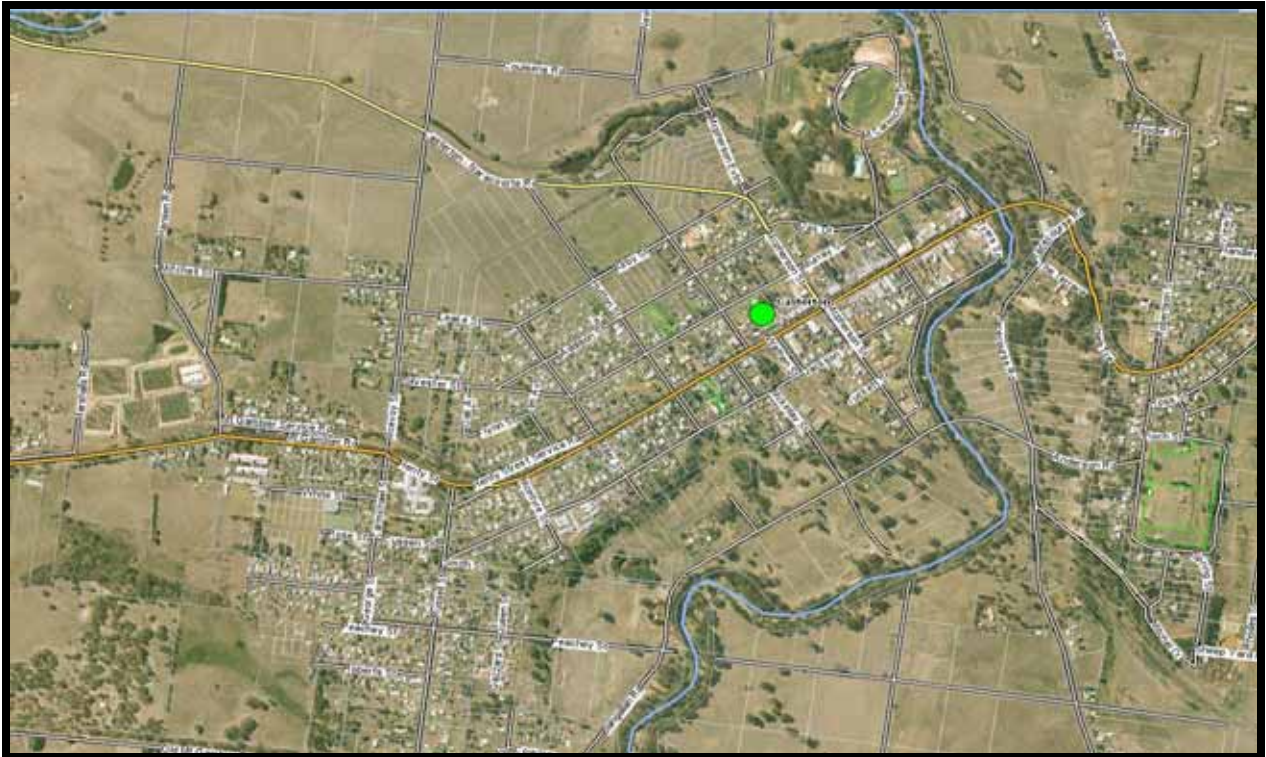
Source: Glenelg Shire

Map 42 B1 Subdivision Permits Portland



Source: Glenelg Shire

Map 43 B1 Subdivision Permits Casterton



Source: Glenelg Shire

The nine proposed subdivision plans with their respective locations are highlighted in Table 41. As shown by the Table the breadth of subdivision proposal ranges from actual subdivisions to certification of an eight lot subdivision to various lot consolidations. The nine proposals are at various stages of completion. Tables 42 & 43 shows the year in which the subdivision permit was applied for and its progress through the Glenelg Planning Department. Three applications have now been certified and the SOC been issued.

As indicated by the Table, four applications are still progressing through the planning process.

Table 41 B1Z Subdivision Proposals by location

Proposal	Barkly St., Portland	Gawler St., Portland	Henty St., Casterton	Henty St., Portland	Hurd St, Portland	Julia St, Portland	Julia St., Portland	Percy St, Portland	Total
2 Lot Subdivision	0	0	1	0	0	0	0	0	1
Certification Eight (8) Lot Building Subdivision	0	0	0	1	0	0	0	0	1
Certification Forty-Five (45) Lot Subdivision	0	0	0	0	0	0	1	0	1
Certification Two (2) Lot Subdivision	0	0	0	0	1	0	0	0	1
Certification Two (2) Lots consolidation	0	0	0	0	0	0	1	1	2
Consolidation of CA 6,7 & 9 (parts) Sec3	0	0	0	0	0	1	0	0	1
Consolidation of Two (2) Lots	0	1	0	0	0	0	0	0	1
Two (2) Lot Subdivision	1	0	0	0	0	0	0	0	1
Total	1	1	1	1	1	1	2	1	9

Table 42 B1 Subdivision Permit Progress through the Glenelg Planning Department

Decision * Application Date Crosstabulation

Count		Application Date			Total
		2006	2008	2010	
Decision	Allocated to Planner	0	0	3	3
	Certified and SOC Issued	1	2	0	3
	Certified Only	1	0	0	1
	Referral	0	1	0	1
	Total	2	3	3	8

Table 43 Progress of B1 Submissions Permits through the Glenelg Planning Process

Proposal	Barkly Street, Portland	Gawler Street, Portland	Henty Street, Casterton	Henty Street, Portland	Hurd St, Portland	Julia St, Portland	Julia Street, Portland	Percy St, Portland	Total
Allocated to Planner	0	0	0	1	0	0	1	1	3
Certified and SOC Issued	1	1	0	0	1	1	0	0	4
Certified Only	0	0	1	0	0	0	0	0	1
Referral	0	0	0	0	0	0	1	0	1
Total	1	1	1	1	1	1	2	1	9

16.4 Parking and Traffic Movements

Glenelg Shire undertook a Parking Utilization study for the CBD of Portland in 2008. The CBD was broken in six specific blocks. Map 44 highlights the study area which has the same boundaries as the current B1 zone in Portland. The study area was comprised of:

Block 1 Tyers Street, Percy Street, Henty Street, Hurd Street;
Block 2 Tyers Street, Bentinck Street, Henty Street, Percy Street;
Block 3 Henty Street, Percy Street, Julia Street; Hurd Street;
Block 4 Henty Street, Bentinck Street, Julia Street, Percy Street;
Block 5 Julia Street, Percy Street, Gawler Street, Hurd Street;
Block 6 Julia Street, Bentinck Street, Gawler Street, Percy Street; and
Section 7 Percy Street, Otway Street to Tyers Street.

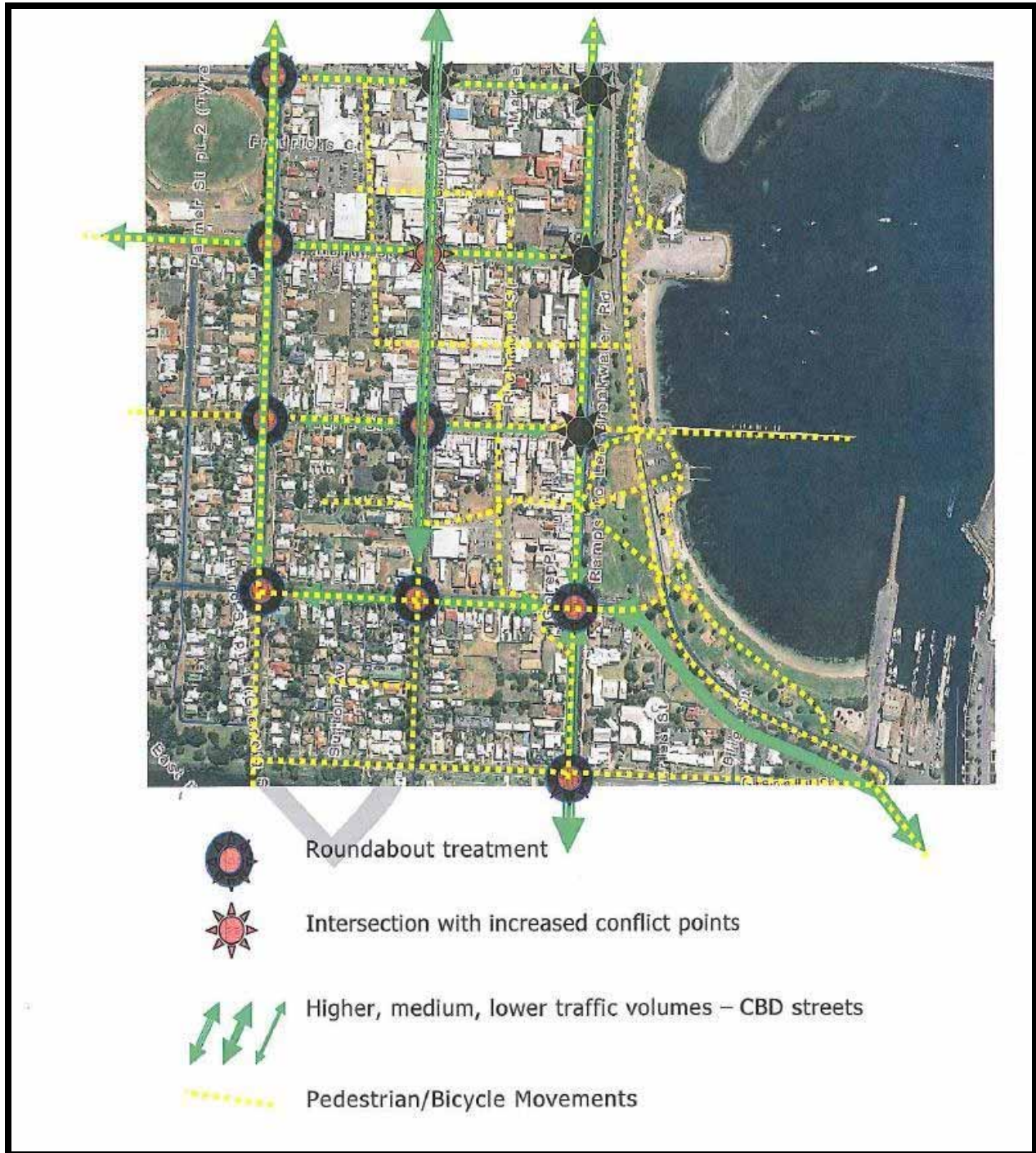
Map 44 Portland CBD Parking Study Area



Source: Glenelg Shire

The Pedestrian and Vehicular linkages for the Portland CBD are illustrated in Map 45. As illustrated by the map the area included in the Portland parking study has pedestrian, bicycle and traffic movements. The higher traffic volumes within the CBD are located on Percy, Bentinck and Gawler Streets.

Map 45 Pedestrian and Vehicular Linkages in Portland CBD



Source: Glenelg shire

The study methodology used parking surveys, business community consultation, public consultation and a review of past studies to gain an insight into the current parking requirement for Portland.

The study concluded that in the B1Zone there is approximately 1,454 public on street and off street car parks and locations available and approximately 710 private car park locations. The study developed a methodology to determine the number of parking spaces required per 100m² of retail floor area. The methodology was based on Clause 52.07 of the Glenelg Planning Scheme.

The parking provision for the seven block study area was analyzed in conjunction with the relative retail square area for each study block.

16.4.1 Block1

The data for Block 1 indicate that this area has undergone changes from previous parking studies. The 2008 study counted spaces which were not considered in previous studies.

Map 46 Block 1 Portland CBD Parking Study



Source: Glenelg Shire

The Parking study determined that Block 1 had a surplus of both public and private parking spaces. The study reported +29 Public spaces and + 40 private spaces giving Block 1 a total surplus of +69 spaces. Block 1 has a large number of formal and informal private parking areas (currently amounting to approx. 40 spaces) for use by traders and staff.

16.4.2 Block 2

Block 2 has also changed from previous parking studies. As with Block 1, Block 2 also has parking spaces that were not accounted for in previous studies.

Map 47 Block 2 Portland CBD Parking Study



Source: Glenelg Shire

This block has a large number of formal and informal private parking areas (currently amounting to approximately 130 spaces) for use by traders and staff. This factor greatly assists in satisfying overall parking needs for this area. The 2008 study indicated that there was a deficiency of **-115** public parking spaces. This deficit (**-115**) becomes positive when taking into consideration the approximate 130 trader and staff spaces. The overall surplus for Block 2 is **+15** spaces.

16.4.3 Block 3

Major structural and capacity changes were recorded for Block 3 in the 2008 parking study. The last parking study did not take into consideration the off street car park behind the Uniting Church.

Map 48 Portland CBD Parking Study Block 3



Source: Glenelg Shire

This block has a large number of formal and informal private parking areas (currently amounting to approximately 75 spaces) for use by traders and staff. Block 3 has been calculated to have deficit of **-84** public spaces. This total is reduced by taking the private parking spaces into consideration thus reducing deficit to **-9** public and private spaces for Block 3.

16.4.4 Block 4

Block 4 has a large number of formal and informal private parking areas (currently amounting to approximately 150 spaces) for use by traders and staff. This greatly assists in satisfying overall parking needs. Calculations undertaken on this block show there is a significant deficit in spaces. The reason this has not had a significant practical effect is that there are dwelling and other non retail premises in Richmond Street, which have low parking requirement generation capabilities.

Map 49 Portland CBD Parking Study Block 4



Source: Glenelg Shire

Estimates for Block 4 indicate that it has a deficiency of **-256** public parking spaces. This figure is reduced by the already mentioned 150 spaces. The total private and public deficiency for Block 4 has been estimated to be **-106** total spaces. The deficiency is further moderated by the fact that Block 6 is relatively close and has a surplus of spaces.

16.4.5 Block 5

This block has a large number of formal and informal private parking areas (currently amounting to approximately 80 spaces) for use by traders and staff. This assists in satisfying predominantly tourism and residential parking needs.

Private Parking within Block 5 is also characterized by on-site parking within the holiday caravan park. Developments in the area of Julia Street will continue to increase the need for short term day use.

Map 50 Portland CBD Parking Study Block 5



Source: Glenelg Shire

Block 5 has a deficiency of **-45** public parking spaces, when this figure is combined with the 80 formal and informal parking spots the deficiency becomes an overall surplus of **+35** total private and public spaces

16.4.6 Block 6

Block 6 has a large number of formal and informal private parking areas (currently amounting to approximately 135 spaces) for use by traders and staff. This total assists in satisfying overall parking needs.

Calculations for this block may have underestimated the surplus due to the large amount of private spaces and informal spaces which are available particularly on the undeveloped land in the block.

Map 51 Portland CBD Parking Study Block 6



Source: Glenelg Shire

It is estimated that Block 6 has a deficit of **-128** public parking spaces. This figure is reduced when the private parking spaces are also taken into consideration. When these spaces are included into the parking mix for the block the deficit now records a surplus of 7 overall parking spaces.

16.4.7 Block 7

This area has not been included previous parking studies. Initial investigation indicates that this block has a large number of formal and informal private parking areas (approximately 100 spaces).

It is estimated that Block 7 has a deficit of **-95** public parking spaces. This figure is reduced when the private parking spaces are also taken into consideration. When these spaces are included in the parking mix for the block the deficit now becomes a surplus of **5** overall parking spaces.

Map 52 Portland CBD Parking Study Block 7



Source: Glenelg Shire

Table 44 summarizes the overall parking provision for the CBD of Portland. As illustrated by the Table the CBD of Portland has a deficit of **-694** public space parking spaces. The main justification for 3.5 spaces per 100 square meters of leasable floor space is section 52.06 of the Glenelg Planning Scheme.

A key finding of the Study is that, in general terms there is sufficient existing parking within Portland's CBD, ***providing the existing level of public and private parking is maintained and retail floor area does not increase***. If there is an increase in retail floor area there will be increased pressure on the existing inventory of parking facilities.

The key pressure areas for parking are Percy Street (Tyers Street-Julia Street), Henty Street (east) Julia (east) and Bentinck Street (Henty Street- Gawler Street). These areas are currently operating at or near maximum capacity in terms of on-street parking. Council needs to explore the potential for increased provision of off street parking facilities in these areas.

Table 44 Parking Provision relative to Retail Floor Space for the CBD of Portland

Block	Public Parking spaces on Street	Public Parking spaces off Street	Total Public Spaces	Private Parking Spaces Off Street	Parking Spaces as per formula 3.5 spaces per 100 sq m of leasable floor space	Public Space + surplus or - deficit	Private and Public Spaces + surplus or - deficit
1	173	279	452	40	423	+29	+69
2	156	0	156	130	271	-115	+15
3	149	103	252	75	336	-84	-9
4	157	0	157	150	413	-256	-106
5	135	0	135	80	180	-45	+35
6	151	103	254	135	382	-128	+7
7	48	0	48	100	143	-95	+5
Total	969	485	1454	710	2148	-694	+16

The analysis of the B1 zone indicates that there is a shortage of B1 zoned land. If land in Portland was rezoned to become B1 the rezoning has the potential to increase the demand for parking in the CBD or near CBD areas. The potential increase in demand will further enlarge the current deficit in parking resources unless provisions are made to increase the supply of public parking.

16.4.8 Current B1Z Portland Soil Characteristics

Portland CBD has the following soil characteristics as identified by the Victorian Department of Primary Industry (DPI) and the Department of Sustainability and Environment (DSE).

Table 45 Portland B1 Soil Characteristics

Soil Condition	Level
Acidification	High
Dispersive Behaviour	Moderate
Land instability	Low
Nutrient decline	Moderate
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	7 Normal
Impeding	<200 mm
Drainage	Impervious
Total Topsoil	80 mm

Source:

Summary

The importance of the soil condition in Portland B1Z zone is a moot point. No agricultural activities will be conducted in a built-up CBD area. What the data highlights is through commercial activity soils do have the potential to become more acidic over time which can impact on the overall built environment.

Soil Condition Legend:

Acidification Soil acidity is expressed as a pH value, with values from 0 to 14, where any value below 7 represents acid conditions and all values above 7 are alkaline conditions

Dispersive Behaviour The formation of hard surface crusts after rain

Land Instability Land Instability assesses the potential for rapid movement of a large volume of soil. This includes mass soil movement through slope failure, shifting sand dunes and wave erosion

Nutrient Decline Decline in the nutrients in soil layers

Salinity the hazard of the land being affected by salinity in the future

Soil Structure Decline General Decline in the structure of soil layers

Water logging is excess water, in terms of saturated soil layers

Water erosion is the inherent susceptibility of the land to the loss of soils as a result of water movement across the surface

Wind erosion is the inherent susceptibility of the land to the loss of soils as a result of wind movement across the surface

pH The pH of a soil measures its acidity or alkalinity

Impedance is the depth at which water is restricted from flowing further down into the soil by bedrock

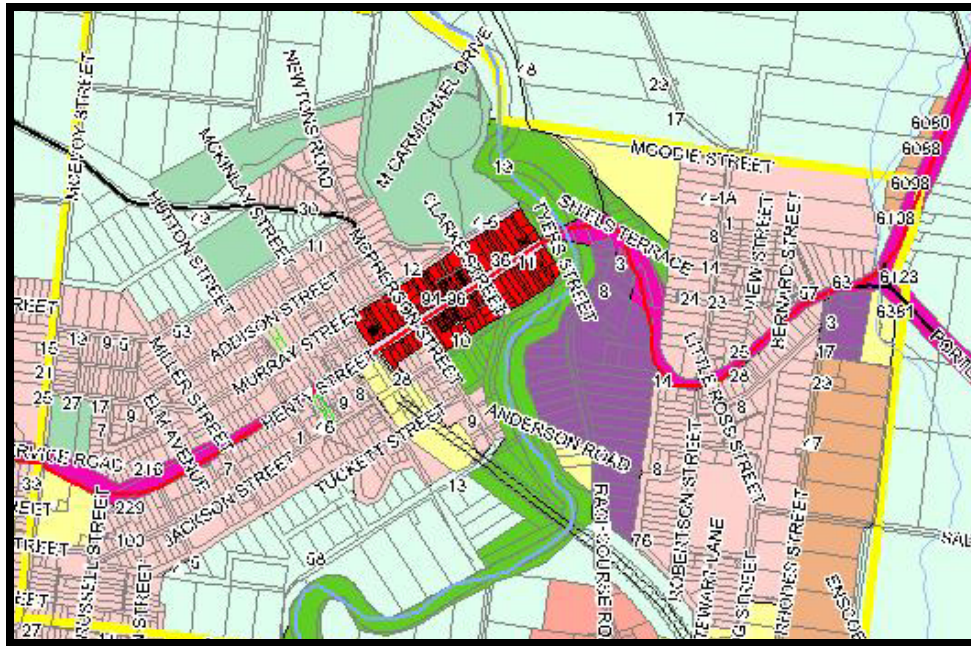
Drainage How quickly water is removed through lateral movement and evaporation for a soil layer

Total topsoil A calculation indicating the top soil depth before encountering hard pan or bedrock

16.4.9 Current B1Z Casterton

Casterton has 137 parcels that have been identified as B1Z properties within a 5 km radius of the CBD of Casterton. The vast majority of these parcels are collectively in one area. The area is bounded by Watheron Street to the West, Murray Street to the North, Jackson Street to the South and Tyers Street to the East and is portrayed as a red area in Map 23. 107 out of the 137 parcels or 78.1% have an area of 0.10 hectare or less which reinforces the B1Z zoning concept of intensive business centers for retailing and other complementary, commercial, entertainment and community uses.

Map 53 B1 Z Parcels within 5 KM of Casterton



Source: Glenelg Shire

Table 46 Summary of B1 Zone in Casterton

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	Hectares
B1Z	40C	Non rateable	8	n/a	n/a	0.7
	41C	Residential built	23	23	0	1.63
	42C	Residential land	2	0	2	0.11
	43C	Comm/indust built	98	98	0	6.91
	44C	Comm/indust land	5	0	5	0.34
TOTAL			136	N/A	N/A	9.89

Source: Glenelg Shire

16.4.10 Fire Proneness of the Zone

The B1 zone is not prone to bushfires.

16.4.11 Land Use Impediments

The occurrence of flooding is the only major land use impediment

16.4.12 Forecast Population over the next 20 years

The population of Glenelg is to remain stable with only a slight increase in population over the next 20 years. The one impact that will occur is that a greater percentage of the population will be over 65 years of age.

16.4.13 Levels of Fragmentation in the Zone

The B1 Zone has been badly fragmented with private dwellings intermingling with commercial and retail facilities. In Casterton 23 residential dwellings have been built in the zone. This figure represents 17% of the total B1 zone for Casterton.

16.4.14 Subdivision Permits

See section 12.2.7 for comments regarding Casterton

16.4.15 Parking and Traffic Movements

There have been no traffic studies conducted in Casterton.

16.4.16 Current Casterton Soil Characteristics

Casterton CBD has the following soils characteristics as identified by the Victorian Department of Primary Industry (DPI) and the Department of Sustainability and Environment (DSE).

Table 47 Casterton B1 Zone Soil Characteristics

Soil Condition	Level
Acidification	Moderate
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	83% pH 5 17% 7 pH
Impeding	83% >300 cm 17% 200-300 cm
Drainage	All parcels
Total Topsoil	85% 215 cm 15 % 130 cm

Source: Victorian Department of Primary Industry

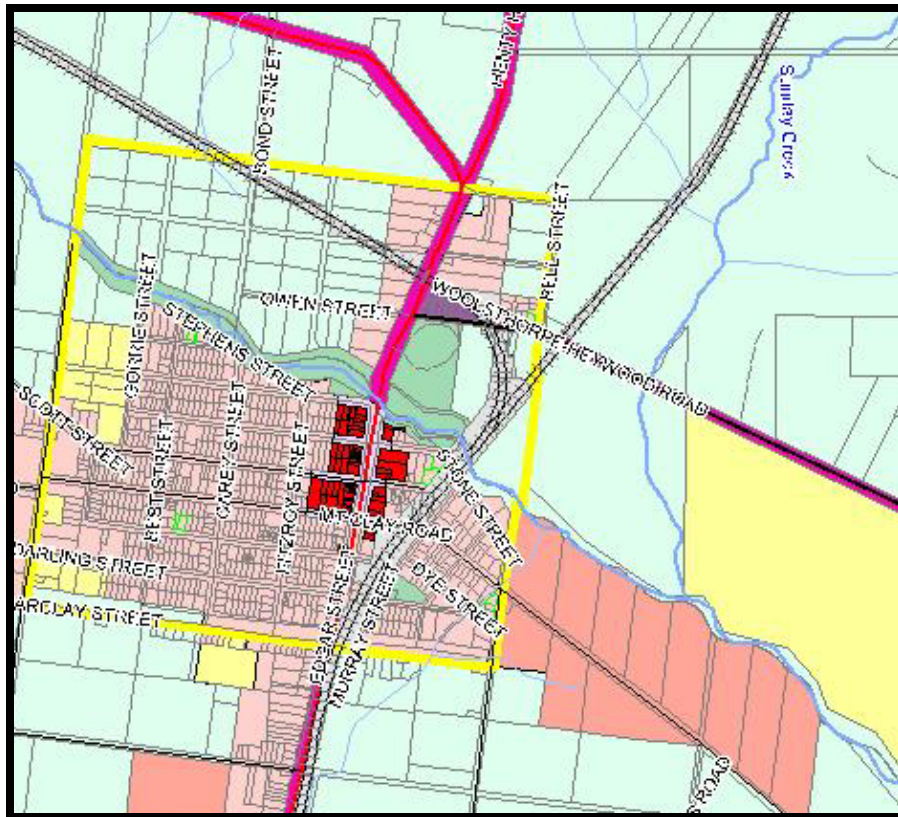
Summary

The importance of the soil condition in Casterton B1Z zone is a moot point. No agricultural activities will be conducted in a built-up CBD area. What the data highlights is though commercial activity soils do have the potential to become more acidic over time.

16.4.17 Current B1Z Heywood

Heywood has 65 parcels that have been identified as B1Z properties within a 5 km radius of the CBD of Heywood. The vast majority of these parcels are co-located in one area. The area is bounded by Fitzroy Street to the West, Cameron Street to the North, Lindsay Street to the South and Sidley Place to the East and is portrayed as a red area in Map 54. 52 out of the 66 parcels or 78.7% have an area of 0.10 hectare or less which reinforces the B1Z zoning concept of intensive business centers for retailing and other complementary, commercial, entertainment and community uses.

Map 54 B1Z Parcels within 5 Km of Heywood



Source: Glenelg Shire

Table 48 Summary of B1Z in Heywood

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	Hectares
B1Z	15P	Non rateable	1	N/A	N/A	0.05
	20H	Non rateable	8	N/A	N/A	1.28
	22H	Comm/indust built	47	47	0	3.03
	23H	Residential built	5	5	0	0.65
	24H	Residential land	2	0	2	0.27
	30H	Comm/indust land	1	0	1	0.1
	62B	Recreation built/land	1	N/A	N/A	0.1
TOTAL			65	N/A	N/A	5.49

Source: Glenelg Shire

16.4.18 Fire Proneness of the Zone

The B1 zone is not prone to bushfires.

16.4.19 Land Use Impediments

The occurrence of flooding is the only major land use impediment

16.4.20 Forecast Population over the next 20 years

The population of Glenelg is to remain stable with only a slight increase in population over the next 20 years. The one impact that will occur is that a greater percentage of the population will be over 65 years of age.

16.4.21 Levels of Fragmentation in the Zone

The B1 Zone has been badly fragmented with private dwellings intermingling with commercial and retail facilities. Heywood has the lowest level of fragmentation in the B1 zone in Glenelg. Heywood has a fragmentation percentage of 11 %.

16.4.22 Subdivision Permits

Please refer to section 12.2.7 for comments relating to Heywood

16.4.23 Parking and Traffic Movements

There have been no traffic studies conducted in Heywood

16.4.24 Current Heywood Soil Characteristics

Heywood CBD has the following soils characteristics as identified by the Victorian Department of Primary Industry (DPI) and the Department of Sustainability and Environment (DSE)

Table 49 Heywood B1 Soil characteristics

Soil Condition	Level
Acidification	Low
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low / Moderate
Water logging	Low / Moderate
Water erosion	Low / Moderate
Wind erosion	Low
pH	
Impedance	
Drainage	
Topsoil	

Source: Glenelg Shire

16.4.25 Retail Activity

Retail Activity in the Shire accounts for 900 jobs or 11% of total jobs in the Shire. Around three quarters of these jobs are located in the Portland Area.

Table 50 Retail Activity Employment

Industry	Non Employing	1-4	5-19	20-49	50-99	100-199	200+	Total
Retail Trade	69	72	33	3	0	0	0	186

Source: Australian Bureau of Statistics

Most of these persons are employed in small businesses. Of the 186 operating businesses in the Shire, 69 were proprietor operated businesses which did not employ any staff, and 72 employed between 1 and 4 persons. At the larger business end there were only 12 retailers in the region who employed between 20-50 persons and only 33 businesses that employ between 5 and 19 persons. The larger retailers typically include supermarkets (such as Foodworks in Casterton and the Safeway in Portland) and stores such as Retravision. Portland acts as the retail centre for the Shire and has 75% of retail jobs in the Shire. There was a fall in retail jobs in the Shire between 2001 and 2006. There are some structural issues in the retail sector. Other than the supermarkets, there are few large retailers located in the Shire, with the sector comprising small retailers. With the absence of major retailers, there are some retail leakages to other population centers in the region.

Retailers such as Bunnings, Harvey Norman and discount stores such as Target are a major draw card for customers, even where any savings in price may be offset by travel costs. These larger retailers are sensitive to market size and catchment and will move into an area once it reaches a threshold size. They act as attractors and tend to have spin offs to other retailers that are located in proximity to them.

Consultations were held with retailers as part of the Glenelg Shire Business Retention and Expansion Program study at which time a number of issues were mentioned including:

- The absence of large retailers in Portland
- Concerns about opening hours of businesses, including during the peak tourist season
- Limited stock ranges in some retailers
- Lack of a service culture and staff who are not well trained in customer service
- The narrow range of retailers in the town centre

While there is leakage to the other major centres (Mount Gambier, Hamilton and Warrnambool) the view was expressed that the isolated nature of the retail market (at least, from the perspective of local retailers) meant that they did not feel direct local competitive pressures to improve standards of service.

Key development issues include: attracting larger retailers; examining the layout of the retail areas in the CBD; and developing the Portland foreshore with restaurants and specialist retail that is attractive to visitors. There has been little effort to provide a large greenfield retail area in close proximity to the CBD and this may be inhibiting major retail developments.

The Warrnambool retail study calculated that Portland accounted for 6% of food, groceries and liquor, 46% of household goods and 26% of bulky goods sales in Warrnambool. The Portland sales activity in Warrnambool is valued at over \$40 million per annum. Retail leakage to other centers (Hamilton and Mount Gambier) have not been calculated.

16.4.25.1 Tourism activity and its Impact of Retail Activity

Tourism is an increasingly important industry in the Green Triangle region (i.e. S.W. Victoria and S.E. South Australia), with much activity focused on the coast, river and the national parks. Tourism in Glenelg is focused on both the coastal areas and some inland areas of the Shire. The Shire is operating in a competitive market where there has been a decline in visitor numbers. These trends are driven by broader social factors, including smaller family sizes, changing work patterns which are reducing the family summer holiday and replacing it with more short breaks.

In 2010, Glenelg Shire will for the first time produce and launch a major visitors guide throughout Victoria and South Australia. It is anticipated that there will be an increase in day and mini trip visitors to the Shire as a result of the visitors guide.

16.5 Challenges and Options

16.5.1 Challenges

There are many challenges facing this zone including:

15. The future demography of Glenelg – the aging population
16. Physical constraints such as flooding, sink holes and physical infrastructure in the three primary centers (Portland, Casterton and Heywood)
17. Land availability and where to expand the zone in Portland
18. Heritage impacts on the B4 Zone in Portland
19. Parking in Portland
20. Land availability and where to expand the zone in Casterton
21. Land availability and where to expand the zone in Heywood
22. Streetscapes and appearance of the three major retail areas (Portland, Casterton and Heywood) in the shire- 3 majors- UDF
23. Non-commercial uses impacting of the B1 zone in the Portland, Casterton and Heywood.
24. Retail leakage to surrounding areas such as Hamilton, Warrnambool and Mount Gambier

16.5.2 Options

16.5.2.1 Demography

The shire needs to attract either more population or become a venue where people prefer to come and do their shopping. At present there is a large retail leakage out of the shire to other venues (i.e. Hamilton, Mount Gambier and Warrnambool). Glenelg Shire population has a higher than average percentage of the population which has been classified as lower social economic group. This reflects ABS data for Victoria which indicates that Glenelg has a larger than average band of disadvantaged people as opposed to other Victorian locations.

16.5.2.2 Land Availability in Portland

16.5.2.2.1 Limited expansions-Portland sites

- Hanlon Park
- North of CBD B4 only option
- Fuel depot site IN3Z to be reconciled
- The Portland flood plane is in the center of the B1Z and restricts potential developments
- High levels of residential infill also reduce and restrict the current B1Z areas limiting possible expansion of the zone

16.5.2.2.2 Hanlon Park

- Prime site
- Current prime ‘premier’ sporting venue
- Potential opposition to relocation

16.5.2.2.3 North CBD

- Fuel depot reclamation
- Residential , flooding & heritage
- Cost factors

16.5.2.2.4 Casterton and Heywood

Same comments as Portland

16.5.2.3 Streetscapes and appearance of the three major retail areas - Portland, Casterton and Heywood

16.5.2.3.1 Portland Streetscape

- No theme
- Ad hoc development
- Tired & old
- High vacancy rates
- No design framework
- No catalyst for change
- No signage control
- No respect for heritage

The same comments are valid for Casterton and Heywood

16.5.2.4 Retail Leakage & selection

- High leakage-Warrnambool, Hamilton, Mt Gambier
- Limited competitive retail
- High commercial vacancy rate
- Quality of current retail sites

16.5.2.4.1 Casterton and Heywood

Same comments as Portland

16.6 B1 Zone Needs Summary

As indicated by the Current Land Use analysis there is a deficiency in the allowance of B1 Zone land in Glenelg. If the commercial sector is to grow in Portland, Casterton and Heywood in the next 20 years as forecast by the expected number of planning permits then additional land must be rezoned and allocated to the B1 category to meet the expected demand.

17 B4 Zone

17.1 Rational for Business 4 Zone Inclusion in the Study

The B4 Zone may hold the future for retailing in Glenelg. This zone has the ability to reduce or eliminate the current problems facing the Business 1 zone in Glenelg. The problems were outlined in the B1Z section. The zone also has the potential to be rezoned for residential uses.

17.2 Purpose

The purpose of the B4 Zone (B4z) is to encourage the development of a mix of bulky goods retailing and manufacturing industry and their associated business services. Table 50 highlights the various categories that comprise the 168 parcels of B4Z. Table 51 indicates that of the 109 of the 168 parcels have areas of less than 0.1 of a hectare

Table 51 B4Z Parcels by Rating Code

		Levy_Desc			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	C-Comm/Indust Built	8	4.8	4.8	4.8
	C-Non Rateable	1	.6	.6	5.4
	C-Residential Built	6	3.6	3.6	8.9
	C-Residential Land	27	16.1	16.1	25.0
	H-Residential Built	7	4.2	4.2	29.2
	P-Comm/Indust Built	60	35.7	35.7	64.9
	P-Comm/Indust Land	8	4.8	4.8	69.6
	P-Non Rateable	7	4.2	4.2	73.8
	P-Residential Built	44	26.2	26.2	100.0
	Total	168	100.0	100.0	

Source: Glenelg Shire

Table 52 B4Z Parcel Area by Location

.parcelarea_ha * locality Crosstabulation

	locality			Total
	CASTERTON	HEYWOOD	PORTLAND	
parcelarea_ha .10	9	1	99	109
.20	5	4	11	20
.50	20	2	4	26
1.00	8	0	1	9
2.00	0	0	3	3
3.00	0	0	1	1
Total	42	7	119	168

17.3 Land Use

There are 9 separate classes or categories in the B4zone.

Casterton has 4 classes

***C-Commercial / Industrial built,
C-Non Rateable,
C Residential Built and
C Residential Land.***

Heywood has one category

H Residential Built.

Portland has 4 categories

***P Commercial-Industrial Built,
P Commercial/ Industrial Land,
P Non Rateable and
P Residential Built)***

17.3.1 Current Land Use Analysis

The B4Z zone contains 168 parcels which have been segmented by 9 categories of property levy codes i.e. (commercial / industrial built; non rateable; residential land; residential built; recreational built and comm. /industrial land). 68 of the 168 or 40.4% are classified as the commercial / industrial built category; this category represents a parcel with a commercial business facility existing on the parcel. Portland has 60 (88.2%) B4Z parcels followed by Casterton with 8 or 11.7%.

The second largest category is the residential built category with 57 parcels or 33.9% of the total B4Z parcels in Glenelg. Portland has 44 or 77.1% parcels followed by Casterton with 6 or 10.5% and Heywood with 7 or 12.2% respectively. This category represents a parcel with a dwelling constructed on the parcel.

The third major category is non rateable. This category has 8 parcels with Portland having 7 parcels or 90% of parcels.

The two categories representing vacant land i.e. (commercial /industrial land and residential land) represent a total of 35 parcels or 20.83 % of all B4Z parcels. This category represents the current B4Z vacant land which is available for development in Glenelg.

Table 53 B4Z Property Description by Location

Levy_Desc * locality Crosstabulation

		locality			Total
		CASTERTON	HEYWOOD	PORTLAND	
Levy_Desc	C-Comm/Indust Built	8	0	0	8
	C-Non Rateable	1	0	0	1
	C-Residential Built	6	0	0	6
	C-Residential Land	27	0	0	27
	H-Residential Built	0	7	0	7
	P-Comm/Indust Built	0	0	60	60
	P-Comm/Indust Land	0	0	8	8
	P-Non Rateable	0	0	7	7
	P-Residential Built	0	0	44	44
	Total	42	7	119	168

From 2000 to the end 2009; 4817 building permits were issued across Glenelg. Thirty four building permits were issued for parcels zoned B4Z

Table 54 Value of B4Z Building Permits 2000-2009

Casterton			Heywood			Portland		
Year	Number	Value	Year	Number	Value	Year	Number	Value
2000	0	0	2000	0	0	2000	7	126,100
2001	0	0	2001	0	0	2001	1	41,000
2002	0	0	2002	1	4900	2002	1	5,000
2003	1	37,000	2003	0	0	2003	4	489,000
2004	1	25,000	2004	0	0	2004	1	11,000
2005	1	36,000	2005	0	0	2005	1	1,500
2006	0	0	2006	0	0	2006	6	51,500
2007	0	0	2007	0	0	2007	1	2,000
2008	1	34,900	2008	0	0	2008	3	29,300
2009	0	0	2009	0	0	2009	4	278,00
Total	4	\$132,190		1	\$4,900		29	1,034,400

An analysis of the building permits for B4Z land over the 10 year period indicated that Casterton had on average 0.5 permits per year; Heywood 0 and Portland 2.9 permits per annum over the 9 year time frame.

Building permits may or may not indicate the construction of a new building. Building permits have ten classes (*class 1* houses; *class 2* flats; *class 3* motels & shared accommodation ; *class 4* caretakers; *class 5* offices; *class 6* shops including hotels ; *class 7* warehouses; *class 8* factories; *class 9* public buildings and *class 10* an overarching category that take in sheds, fences, awnings signs etc).

The building permits for the nine year period 2000-2009 show that only nine out of the 34 were for actual new construction that required additional or new land

A 10 year forecast relating to future building permits was undertaken. Scenarios of 1 %, 2 %, and 3% growth per annum were used to forecast potential building permits for a ten year span from 2010 to 2020 for B4Z land. For Casterton and Heywood no additional B4 zoned land is required to meet expected demand in the next 10 years.

For Portland with a 1% growth rate per annum in B4Z permits Portland can expect to average no change in the demand for B4Z permits up to 2020 (2.9 per annum). A 2% growth rate yields 3.2 permits in 2020 and a 3% yield 3.5 permits in 2020.

As indicated earlier the increased number of building permits does not reflect the actual demand for additional B4Z land. A Land budget for B4Z property in Glenelg was developed for the period 2010 to 2030.

Table 55 B4 Available Land and Demand

Available B4Z Land and Demand	
Vacant B4Z lots based on property rating system	35
Building construction over 9 years (2000-2009)	0
Average lot uptake (2000-2009)	0
Estimated current supply of B1Z zoned land (vacant lots)	35*
Land required to provide 20 year supply at current take rate (0 parcels)	0
Estimated deficit of lots	none

- Extent of developable land may be significantly less than this due to development constraints

Under current and projected conditions there is sufficient B4 zoned land in Glenelg. Glenelg’s allocation of B4 zoning was compared to surrounding shires to develop an index which would indicate the level of B 4 zone square footage per head of population.

The following regional centers were used in the analysis: Apollo Bay; Ararat; Camperdown; Casterton; Colac; Hamilton; Heywood; Horsham; Port Fairy; Portland; Terang; Torquay and Warrnambool.

The data was gathered using the Department of Planning and Community Development automated mapping system. The methodology to determine the total Business Zone area for the

13 locations included identifying and tracing each Business Zone parcel per locale and summarizing that data into a total for each location.

For total area B4 Portland ranks 3rd with 173,666 Square Meters, Casterton (4th) has 140,000 Square Meters and Heywood (8th) 15,111 Square Meters. On a square meters per head of population basis Portland (ranks 6th) with 17.87 Square Meters per head of population, Casterton (ranks 1st) with 86.52 Square Meters per head and Heywood (7th) with 12.29 Square Meters per head of population.

Table 56 B4Zone Area Compared to Population

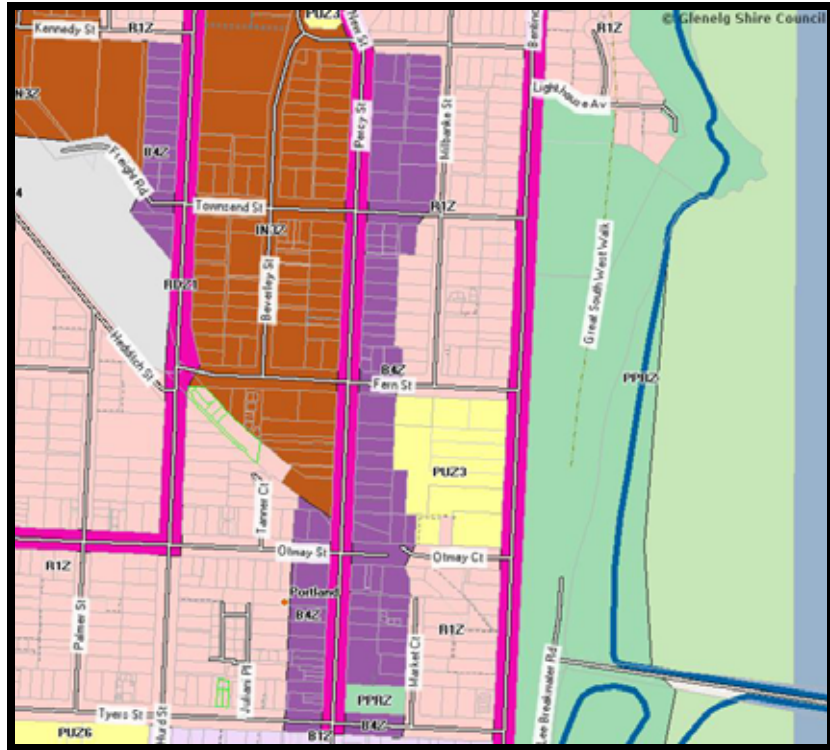
Town	Population	Total Business Zone Area	Total Business (Square Meters) Per head of population	B4 Square Meters	B4 per head of population
Apollo Bay	1278	392,251.7	306.9262	0	0
Ararat	7067	7,111,140	1006.246	11,700	1.6555
Camperdown	3028	2,649,012	874.8389	80,993	26.74
Casterton	1618	1,392,330	860.5254	140,000	86.52
Colac	10562	6,807,790	644.555	515,400	48.79
Hamilton	9484	4,620,458	487.1845	NA	NA
Heywood	1229	3,556,606	289.3902	15,111	12.29
Horsham	13290	11,877,644	893.7279	456,885	34.37
Port Fairy	2631	593,131	225.4394	NA	NA
Portland	9716	5,762,029	593.0454	173,666	17.87
Terang	1787	181,544.4	101.5917	38,150	21.34
Torquay	9468	305,560.2	32.27294	0	0
Warrnambool	28029	41,502,814	1480.71	130,517	4.656
Total	99187	83,551,366		1,562,422	

Source: Glenelg Shire

17.3.2 Current B4Z Portland

All of Portland's B4 z is within a 5 Km radius of the CBD of Portland. The vast majority of these parcels are collectively in one area (the CBD). Table 56 highlights how fragmented the B4 zone is in Portland. Forty four private residences are currently situated in the zone.

Map 55 B1Z Parcels with 5 KM of Portland



Source: Glenelg Shire

Table 57 B4 Zone Portland

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	HA
B 4 Z	2P	Residential built	44	44	0	3.27
	4 P	Comm./ Indus Built	60	60	0	4.64
	5 P	Comm./Indus. Land	8	0	8	7.94
	15 P	Non rateable	7	N/A	N/A	1.09
Total			122	104	8	17.04

Source: Glenelg Shire

17.3.3 Fire Proneness of the Zone

The B4 zone is not prone to bushfires.

17.3.4 Land Use Impediments

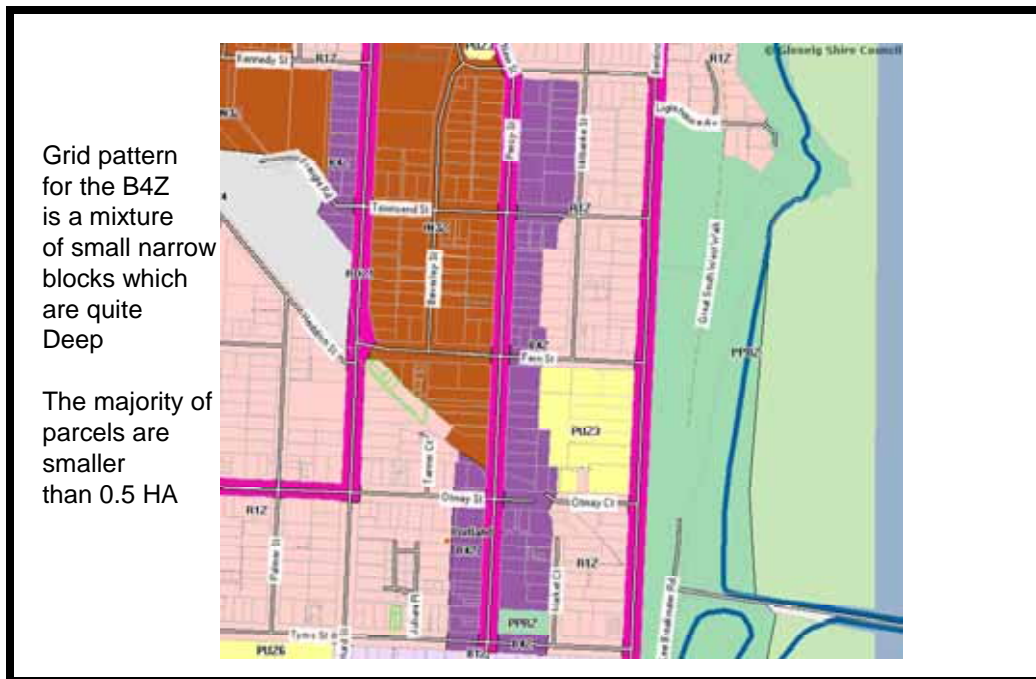
The occurrence of flooding is the one of several identified major land use impediments. As stated earlier 145 parcels would be impacted by a 1 in 10 year flood incident and 229 parcels would be impacted by a 1 in 100 year flood. Another impediment for development in the B4 zone is the historic importance and character of the CBD of Portland. Portland had a rich collection of

historic buildings that represent the early beginning of Victoria. Over 100 heritage buildings are listed nationally most of which are located in the CBD of Portland.

The rationale for why a building may be considered important from an historic point of view may include:

- **Rarity**, a building or elements its comprises may be unique or highly unusual
- **Architectural quality**, a building or part of a building may contain elements of high architectural quality
- **State of preservation**, a building or part of a building may contain elements of high architectural quality
- **Historical links**, a building may have important links with past historical events or evince an important time in a particular town's development
- **Usage of local construction materials** or techniques

Grid pattern for the B4 zone area is a mixture of small narrow grained blocks which are quite deep.



17.3.5 Forecast Population over the next 20 years

The population of Glenelg is to remain stable with only a slight increase in population over the next 20 years. The one impact that will occur is that a greater percentage of the population will be over 65 years of age. With the aging Portland Population the demand for retail goods usually associated by B4 retail activities (i.e. Big Box stores may decrease in future).

17.3.6 Levels of Fragmentation and building utilization in the Zone

The B4 Zone has been badly fragmented with private dwellings intermingling with commercial and retail facilities. Comments from local realtors view the current stock of commercial

properties as substandard as opposed to other regional centers (i.e. Hamilton and Warrnambool). Thirty six percent of the zone has been fragmented by residential development (44 parcels)

17.3.7 Subdivision Permits

For the period 2000-2010 there were two subdivision applications submitted for the Business 4 zone (B4Z). Table 57 highlights the year and the respective number of subdivision permits received by the Glenelg Shire.

Table 58 B4Z Subdivisions permits by year

		Application Date			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2007	2	100.0	100.0	100.0

Source: Glenelg Shire

Subdivision development in the B4 zone has only occurred in 2007. The development occurred in Portland as indicated in Table 59. Map 56 indicated that B4 subdivisions occurred in two locations (i.e. Dark Gold dots) in Portland

Table 59 B4 Development Areas

		Property Address			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Henty Hwy, Portland	1	50.0	50.0	50.0
	Percy Street, Portland	1	50.0	50.0	100.0
	Total	2	100.0	100.0	

Source: Glenelg Shire

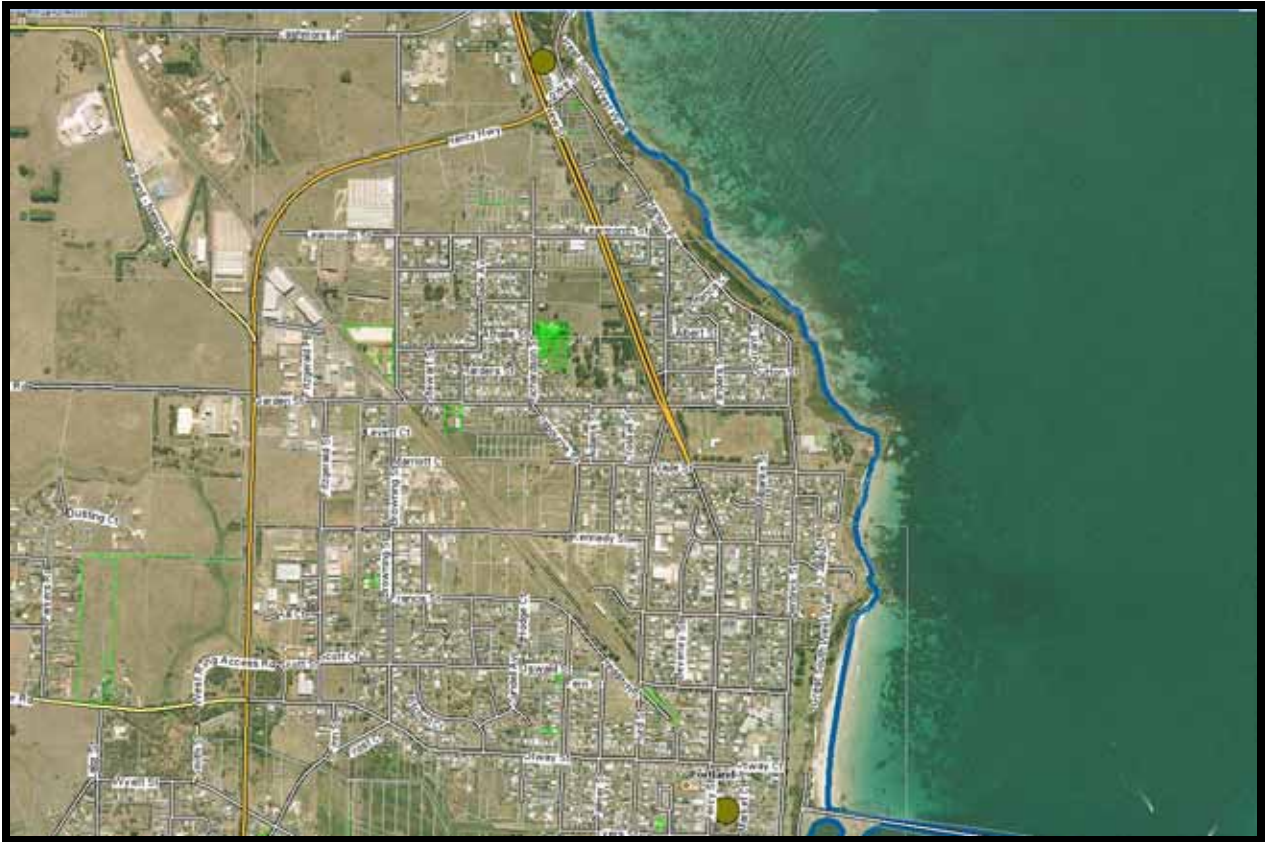
The two subdivision plans with their respective locations are highlights in Table 59. As shown by the Table 60 the two proposals dealt with consolidation and were completed in 2007

Table 60 B4 Subdivision permit progress through the Glenelg Planning Department

		Application Date	
		2007	Total
Decision	Certified and SOC Issued	2	2
	Total	2	2

Source: Glenelg Shire

Map 56 B4 Subdivision Permits Portland



Source: Glenelg Shire

17.3.8 Parking and Traffic Movement

No traffic and parking studies have been conducted for the B4 zone area.

17.3.9 Current B4Z Portland Soil Characteristics

Portland CBD has the following soils characteristics as identified by the Victorian Department of Primary Industry (DPI) and the Department of Sustainability and Environment (DSE).

Table 61 Portland B4 Soil Characteristics

Soil Condition	Level
Acidification	High
Dispersive Behaviour	Moderate
Land instability	Low
Nutrient decline	Moderate
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	7 Normal
Impeding	<200 mm
Drainage	Impervious
Total Topsoil	80 mm

Source: Victorian Department of Primary Industry

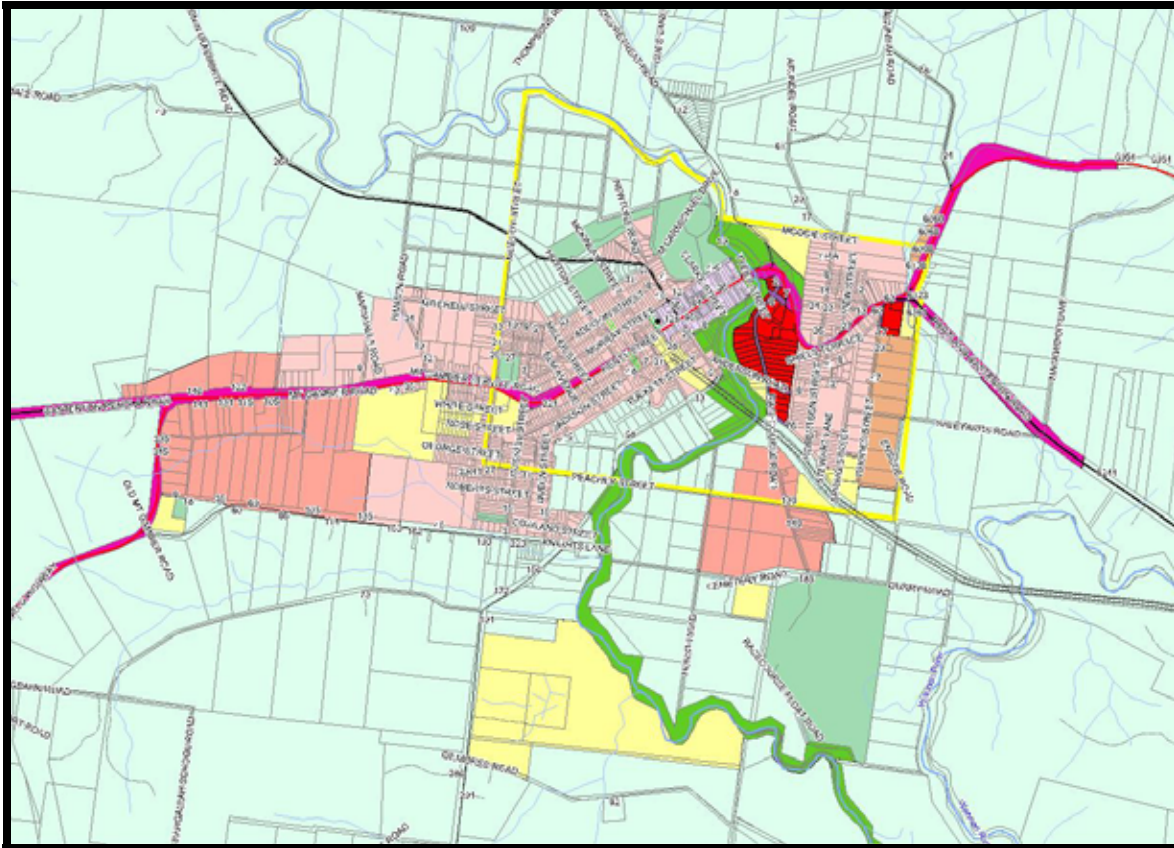
Summary

The importance of the soil condition in Portland B4 Z zone is a moot point. No agricultural activities will be conducted in a built up CBD area. What the data highlights is through commercial activity soils do have the potential to become more acidic over time which can impact on the overall built environment.

17.4 Current B4Z Casterton

Casterton has 45 parcels that have been identified as B4Z properties within a 5 km radius of the CBD of Casterton. The vast majority of these parcels are collectively in one area. The vast majority has an area of less than 0.5 hectare or less this reinforces the B4Z zoning concept of intensive business centers for retailing and other complementary, commercial, entertainment and community uses.

Map 57 B4 Z Parcels within 5 KM of Casterton



Source: Glenelg Shire

Table 62 Summary of B4 Zone in Casterton

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	Hectares
B4Z	40C	Non rateable	2	n/a	n/a	1.53
	41C	Residential built	6	6	0	0.67
	42C	Residential land	28	0	28	11.51
	43C	Comm/indust built	8	8	0	1.62
	44C	Comm/indust land	1	0	1	0.35
TOTAL			45	N/A	N/A	17.61

Source: Glenelg shire

17.4.1 Fire Proneness of the Zone

The B4 zone is not prone to bushfires.

17.4.2 Land Use Impediments

The occurrence of flooding is the only major land use impediment

17.4.3 Forecast Population over the next 20 years

The population of Glenelg is to remain stable with only a slight increase in population over the next 20 years. For Casterton the population is forecast to decline and the percentage of 65+ age group is expected to increase. This demographic result will impact on the Casterton retail market.

17.4.4 Levels of Fragmentation in the Zone

The B4 Zone has been badly fragmented with private dwellings intermingling with commercial and retail facilities. Seventy five percent of the parcels in the Casterton B4Zone are residential allotments with not commercial focus. The prime purpose of the B4 zone is commercial.

17.4.5 Subdivision Permits

See section 13.2.7 for comments relating to Casterton

17.4.6 Parking and Traffic Movements

There have been no traffic studies conducted for Casterton

17.4.7 Current Casterton Soil Characteristics

Casterton B4 zone has the following soils characteristics as identified by the Victorian Department of Primary Industry (DPI) and the Department of Sustainability and Environment (DSE).

Table 63 Casterton B4 Soil Characteristics

Soil Condition	Level
Acidification	Moderate
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	83% pH 5 17% 7 pH
Impeding	83% >300 cm 17% 200-300 cm
Drainage	All parcels
Total Topsoil	85% 215 cm 15 % 130 cm

Source: Victorian Department of Primary Industry

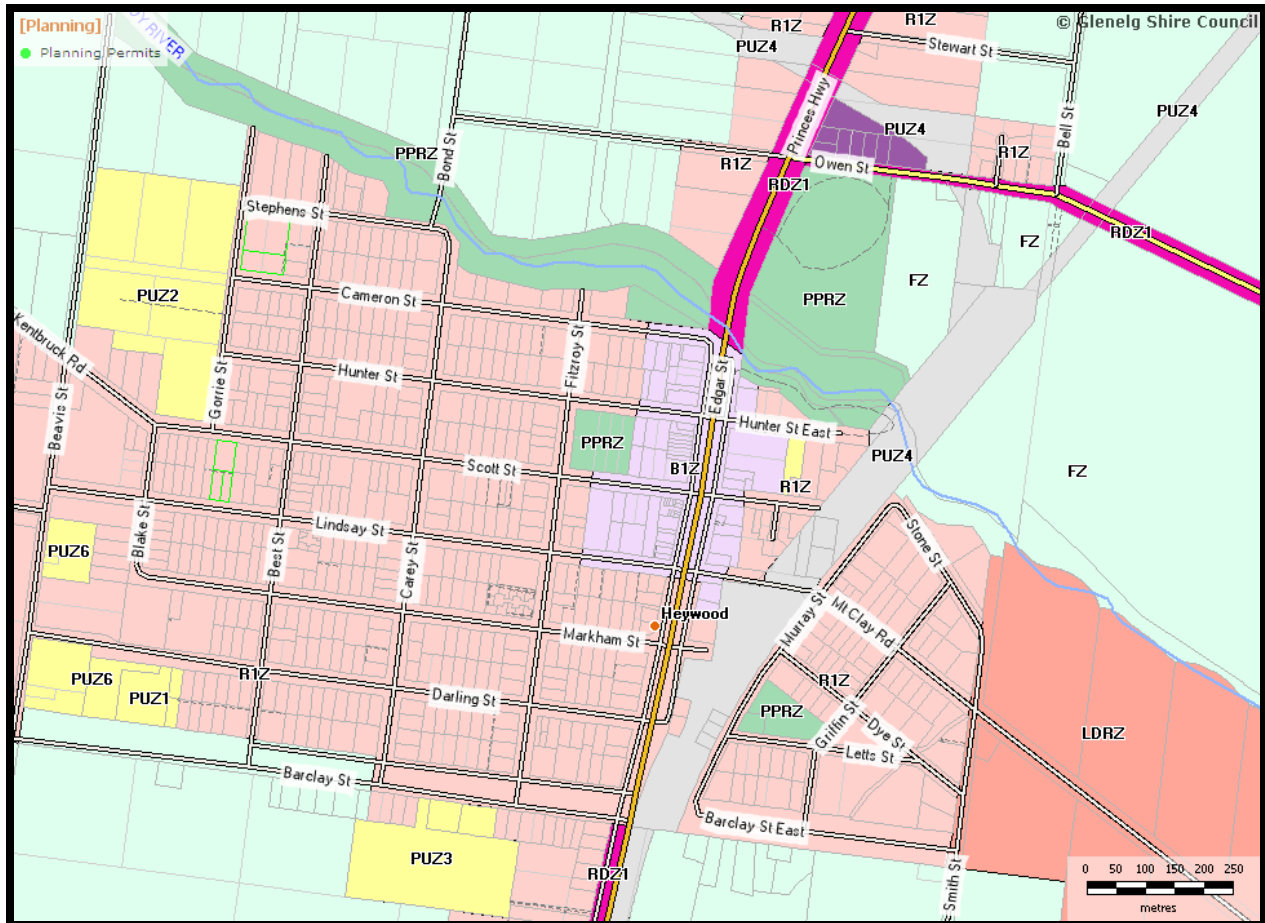
Summary

The importance of the soil condition in Casterton B4Z zone is a moot point. No agricultural activities will be conducted in a built up CBD area. What the data highlights is though commercial activity soils do have the potential to become more acidic over time.

17.5 Current B4Z Heywood

Heywood has 7 parcels that have been identified as B4Z properties within a 5 km radius of the CBD of Heywood.

Map 58 B4Z Parcels within 5 Km of Heywood



Source: Glenelg Shire

Table 64 Summary of B4Z in Heywood

Zone	Levy Code	Levy Description	Total	No. built	Vacant	HA
B4Z	23	H residential	7	7	0	1.11

Source: Glenelg Shire

17.5.1 Fire Proneness of the Zone

The B4 zone is not prone to bushfires.

17.5.2 Land Use Impediments

The occurrence of flooding is the only major land use impediment

17.5.3 Forecast Population over the next 20 years

The population of Glenelg is to remain stable with only a slight increase in population over the next 20 years. Heywood has been forecast to have a decrease in population during that time frame. Grouped with the population decrease the 65+ age group is expected to increase.

17.5.4 Levels of Fragmentation in the Zone

The small B4 Zone in Heywood has been badly fragmented with private dwellings intermingling with commercial and retail facilities. In Heywood every parcel in the commercial B4 zone is residential.

17.5.5 Subdivision Permits

See section 13.2.7 for comments relating to Heywood

17.5.6 Parking and Traffic Movements

There has been no traffic or parking studies conducted for Heywood

17.5.7 Current Heywood Soil Characteristics

Heywood CBD has the following soils characteristics as identified by the Victorian Department of Primary Industry (DPI) and the Department of Sustainability and Environment (DSE)

Table 65 Casterton B4 Soil characteristics

Soil Condition	Level
Acidification	Low
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low / Moderate
Water logging	Low / Moderate
Water erosion	Low / Moderate
Wind erosion	Low

Source: Glenelg Shire

17.5.8 Retail Activity

The same comments that apply to B1 zone are applicable for the B4Z.

17.6 Challenges and Options

The Challenges for the B4 zone are similar to that of the B1 zone. The current B4 Zone is underutilized

17.6.1 Challenges

7. Is zone relevant? (what is the demand for box stores) Can the current B4 zone be converted to B1 zone?
8. Residential contamination
9. Limited land size
10. Possible flooding, sinkholes, fragmentation
11. Something population demand for goods
12. Stagnant growth

17.6.1.1 Options:

There are several option which could be implemented for the current B4 Zone across Glenelg.

- Rezone B4 to either R1Z or B1Z
- Redevelop fuel depot site in Portland as a B4 location
- Use the undeveloped B4 sites (Portland) as residential infill
- Possible PPRZ-ring road
- Possible IN3Z industrial park in the Greater Portland Area

17.7 B4 Z Needs Summary

At present the only area that may need addition B4Z land would be Portland.

18 Industrial Zones

Glenelg has three industrial zones, INZ1, INZ2 and INZ3, each zone has specific uses which are allowed under the Glenelg Planning scheme.

18.1 Rational for IN1 Zone Inclusion in the Study

The rational for the inclusion of the Industrial 1 zone in the study is predicated on the importance of manufacturing and industrial output to the Glenelg economy. Over 1300 jobs are directly associated manufacturing in Glenelg. The viability of this is crucial for the long term economic development of Glenelg.

19 INZ 1 Zone

19.1 Purpose

To provide for manufacturing industry, the storage and distribution of goods and associated uses in a manner which does not affect the safety and amenity of local communities. Table 65 highlights that there are 351 parcels of INZ1 zoned land in Portland, Casterton and Heywood.

Table 66 INZ 1 parcels in Glenelg by location

		locality			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CASTERTON	46	13.1	13.1	13.1
	HEYWOOD	27	7.7	7.7	20.8
	PORTLAND	278	79.2	79.2	100.0
	Total	351	100.0	100.0	

Source: Glenelg Shire

Table 67 shows that 279 out of the 351 parcels (79.4%) have an area of less than 1 hectare in size.

Table 67 INZ1 Parcel Area

parcelarea_ha * locality Crosstabulation

		locality			
		CASTERTON	HEYWOOD	PORTLAND	Total
parcelarea_ha	.10	1	0	48	49
	.20	4	8	78	90
	.50	14	5	104	123
	.75	0	2	10	12
	1.00	0	0	3	3
	1.50	4	1	4	9
	2.00	17	0	12	29
	3.00	6	0	4	10
	5.00	0	0	7	7
	5.71	0	0	3	3
	7.49	0	0	5	5
	28.06	0	11	0	11
	Total	46	27	278	351

Source: Glenelg Shire

19.2 Land Use

There are 11 separate classes or categories in the Glenelg IN1Z zone.

Casterton has 3 classes

C Commercial/ Industrial Built;

C Residential Built and

C residential land.

Portland has 5 classes

P- Commercial / Industrial Built;

P Commercial / Land;

P Non – Rateable;

P Residential Built;

P Residential Land.

Heywood and surrounds has 3 classes

B Commercial / Industrial Built;

B Farm Built; and

B Residential Built).

Table 68 IN1Z Land Use By Property Levy Description

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6	1.7	1.7	1.7
B-Comm/Indust Built	24	6.8	6.8	8.5
B-Farm Built	11	3.1	3.1	11.7
B-Residential Built	12	3.4	3.4	15.1
C-Comm/Indust Built	9	2.6	2.6	17.7
C-Residential Built	5	1.4	1.4	19.1
C-Residential Land	12	3.4	3.4	22.5
P-Comm/Indust Built	156	44.4	44.4	67.0
P-Comm/Indust Land	54	15.4	15.4	82.3
P-Non Rateable	18	5.1	5.1	87.5
P-Residential Built	34	9.7	9.7	97.2
P-Residential Land	10	2.8	2.8	100.0
Total	351	100.0	100.0	

Source: Glenelg Shire

19.3 Current Land Use Analysis

The IN1Z zone contains 351 parcels which have been segmented by 11 categories of property levy codes. 189 of the 351 or 53.8% are classified as the commercial / industrial built category; this category represents a parcel with an industrial facility existing on the parcel. Portland has 156 (82.5%) IN1Z parcels with this classification followed by Heywood and surrounds with 24 or 12.6% and Casterton with 9 or 4.5% respectively.

For all of Glenelg there is currently 76 vacant parcels of IN1Z land (Commercial / industrial and residential). Portland has the majority with 64 parcels and Casterton has the remaining 12.

Table 69 Property Description by Location

Levy_Desc * locality Crosstabulation

Levy_Desc	locality			Total
	CASTERTON	HEYWOOD	PORTLAND	
	0	0	6	6
B-Comm/Indust Built	8	16	0	24
B-Farm Built	11	0	0	11
B-Residential Built	1	11	0	12
C-Comm/Indust Built	9	0	0	9
C-Residential Built	5	0	0	5
C-Residential Land	12	0	0	12
P-Comm/Indust Built	0	0	156	156
P-Comm/Indust Land	0	0	54	54
P-Non Rateable	0	0	18	18
P-Residential Built	0	0	34	34
P-Residential Land	0	0	10	10
Total	46	27	278	351

Source: Glenelg Shire

From 2000 to the end of 2009, 4817 building permits were issued across Glenelg. One hundred and sixty eight (168) multiple building permits were issued for parcels zoned IN1Z. When the multiple permits were rationalized the actual number of individual land parcels requiring a building permit was only 49.

Table 70 Value of B4Z Building Permits 2000-2009

Casterton			Heywood			Portland		
Year	Number	Value	Year	Number	Value	Year	Number	Value
2000	0	0	2000	1	0 *	2000	4	0 *
2001	0	0	2001	0	0	2001	2	0*
2002	1	\$16,000	2002	1	0*	2002	2	\$35,000
2003	0	0	2003	2	0*	2003	4	0*
2004	0	0	2004	0	0	2004	4	\$100,000
2005	0	0	2005	0	0	2005	4	0*
2006	0	0	2006	0	0	2006	4	\$10,111,300
2007	1	\$57,500	2007	1	\$120,000	2007	3	\$414,210
2008	1	\$31,800	2008	0	0	2008	5	\$484,990
2009	0	0	2009	2	\$6,000	2009	7	\$125,610
Total	3	\$105,300		7	\$130,000		39	\$11,136,110

Source Glenelg Shire *No dollar value was recorded with the respective building permits.

An analysis of the building permits for IN1Z land over the 10 year period indicates that there was very little construction in this particular zone. The vast majority of building permits were for either the construction of sheds or garages or for the demolition of structures. The majority of construction occurred in 2006 from the Iluka Mineral Sands Project. No permits required the acquisition of land for the construction of any facilities.

A 10 year forecast relating to future building permits was undertaken for the IN1 zone. Scenarios of 1 %, 2 % and 3% were developed to gauge what impacts proposed future developments may have on Glenelg's existing reserves of IN1Z land. This exercise proved to be fruitless. The low levels of building permits for the period made forecast results meaningless.

Glenelg's allocation of IN1Z was compared to surrounding shires to develop an index which would indicate the level of IN1 zoned square meters per head of population. The following regional centers were used in the analysis: Apollo Bay; Ararat; Camperdown; Casterton; Colac; Hamilton; Heywood; Horsham; Port Fairy; Portland; Terang; Torquay and Warrnambool.

Twelve of the 13 locations have the IN1 zone. The IN1 zone is a general zone for the provision of land for manufacturing industry, the storage and distribution of goods and associated uses in a manner which does not affect the safety and amenity of local communities.

Table 71 indicates the square meters by IN1 Zone by location. Population data for each location was obtained through the Victorian government's Towns in Time program. Heywood has the second largest volume IN1Z land followed by Portland with the fourth largest volume and Casterton with the eight largest.

On a square meters per head of population basis Casterton rank first with 3,041 square meters of IN1 land per head of population, Casterton is in third position with 344 square meters per head of population and Portland in sixth with 173 square meters per head of population. The results for

Heywood and Casterton can be misleading as both centers have a relatively low population which accentuates the amount of IN1 land per head of population

Portland provides a more realistic comparison with centers of similar size such as Hamilton, Colac and Horsham. In comparing the three with Portland, Portland has the third largest amount of IN1 per head of population with 173 square meters per head of population.

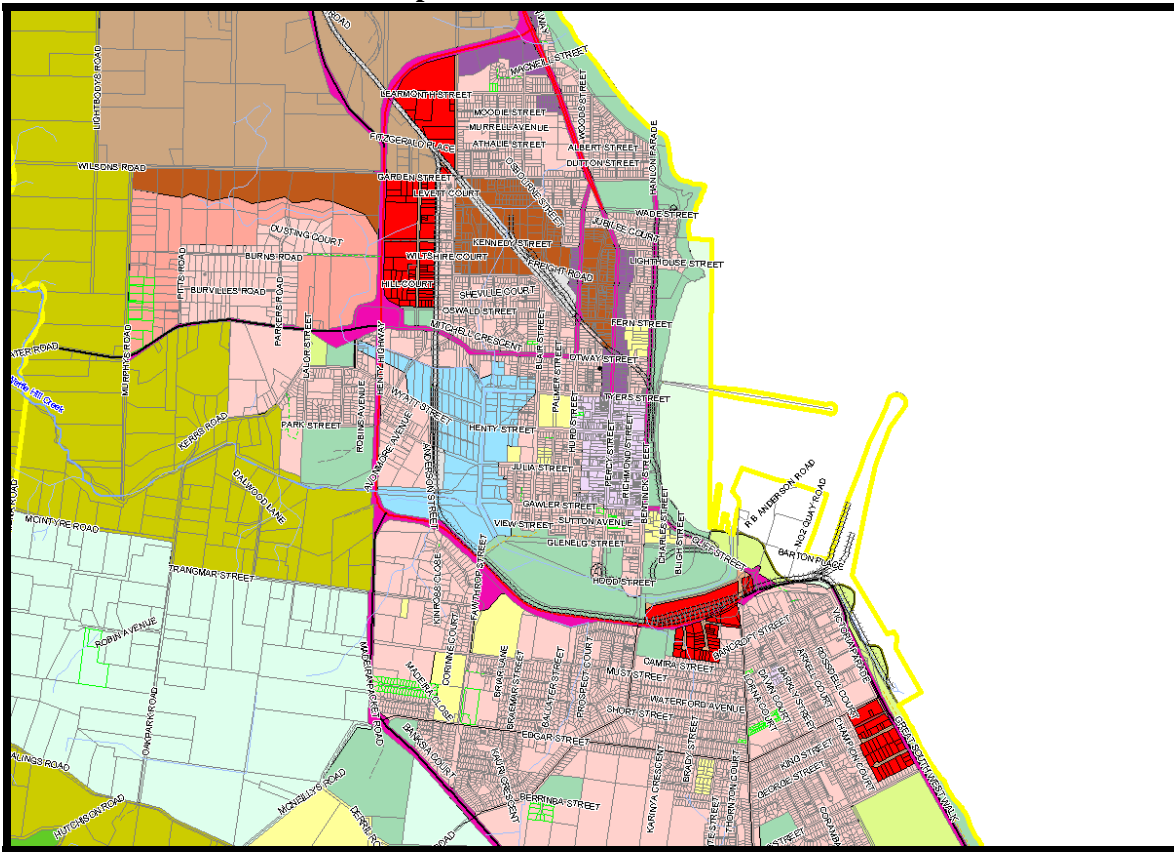
Table 71 IN1 Zone Compared to Population For Selected Locations

Town	Population	Total IN1Z Area (Sq Meters)	IN1Z per head of population
Apollo Bay	1278	49,875	39.02
Ararat	7067	646,594	91.42
Camperdown	3028	344,040	113.61
Casterton	1618	557,365	344.47
Colac	10562	1,640,159	155.28
Hamilton	9484	2,983,152	314.60
Heywood	1229	3,737,525	3041.11
Horsham	13290	5,884,611	442.78
Port Fairy	2631	133,755	50.83
Portland	9716	1,688,476	173.18
Terang	1787	405,655	227
Torquay	9468	0	0
Warrnambool	28029	1,025,115	36.57
Total	99187	19,196,922	192.53

20 Current IN1 Z Portland

Portland has 158 parcels of Industrial land with a combined area of 63.67 hectares, these areas are colored red on Map 59. The location of Industrial 1 land is in the northern and southern regions of Portland. The Industrial 1 land in Portland has been corrupted with the inclusion of residential properties scattered throughout the zone. Table 72 highlights how fragmented the IN1 zone is in Portland. Twenty seven residential parcels (17 % of 48 total IN1Z parcels in Portland) exist in zone with 22 residential dwellings have been constructed in the Portland IN1 zone.

Map 59 Industrial 1 Zone Portland



Source: Glenelg Shire

Table 72 provides an overview of the IN1 zone in the Portland area. The levy code shown in the Table represents a rating code which the shire uses to assess the level of property tax which is assessed to each property.

Table 72 Summary of Industrial 1 Zone Portland

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	HA
In1Z	1 P	Residential land	5	0	5	0.67
	2 p	Residential built	22	22	0	3.23
	4 p	Comm/Indust Built	91	91	0	43.03
	5 p	Comm/Indust Land	29	0	29	13.48
	15 p	Non Rateable	9	N/A	N/A	2.32
Total			158	113	34	63.37

Source: Glenelg Shire

20.1 Fire Proneness of the Zone

The IN1 zone is not prone to bushfires.

20.2 Land Use Impediments

The potential occurrences of flooding and sink holes are the only potential major land use impediments affecting this zone. Current flooding studies indicate the Industrial 1 zone would not be grossly impacted by potential floods. Sink holes are a natural depression or hole in the surface topography caused by the removal of soil or bedrock, often both, by water. Sinkholes may vary in size from less than a meter to several hundred meters both in diameter and depth, and vary in form from soil-lined bowls to bedrock-edged chasms. They may be formed gradually or suddenly, and are found worldwide.

20.3 Levels of Land Use Fragmentation

Nearly 20% of the IN1Z in Portland has been fragmented with residential development. The residential development on the IN1Z in Portland is located in the vicinity of Henty Street in the CBD. The fragmentation of the IN1Z in Casterton is centered on the Portland – Casterton Road area. The fragmentation of the IN1Z land in Heywood is concentrated south of Caton Flats road.

20.3.1 Subdivision Permits

For the period 2000 -2010 there were 10 subdivision applications submitted for the Industrial 1 Zone (IN1Z). Table 73 highlights the year and the respective number of subdivisions permits received by Glenelg Shire.

Table 73 IN1Z Subdivision permits by year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2003	1	10.0	10.0	10.0
	2006	3	30.0	30.0	40.0
	2007	1	10.0	10.0	50.0
	2008	2	20.0	20.0	70.0
	2009	1	10.0	10.0	80.0
	2010	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Source: Glenelg Shire

Subdivision development in the IN1Z has occurred since 2003. This development has occurred in both Portland and Casterton as indicated in Table 74. Maps 60 and 61 indicate that IN1 subdivisions have occurred in two locations in Portland (i.e. north; Wilson Road and Fitzgerald Streets; south; Canal Court and Madera Packet Road and Celina Court). The single subdivision

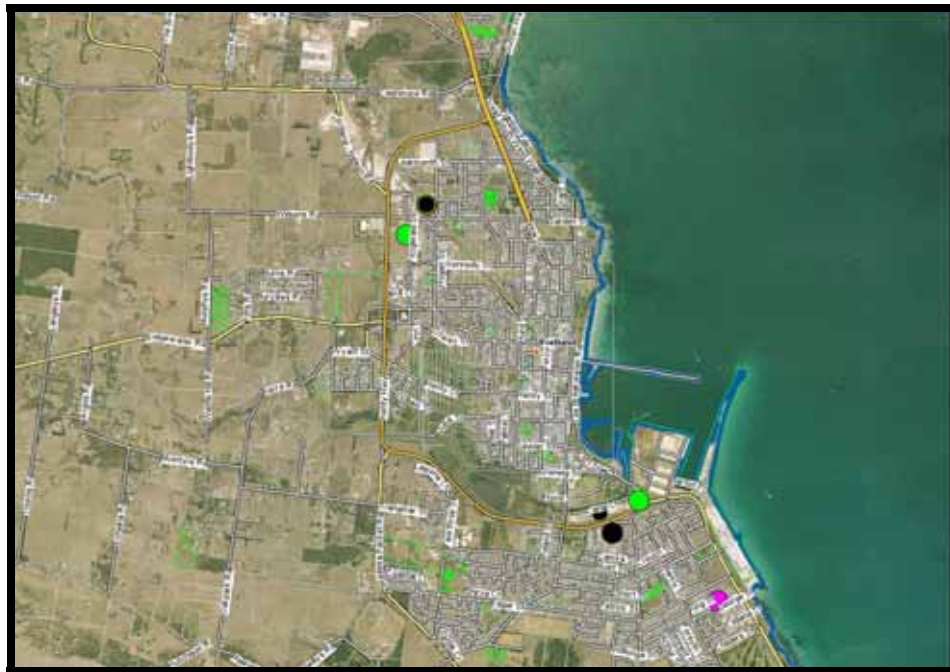
in Casterton is located between Saleyard Road and Rhodes Street. The colour keys for the respective maps are Black 2010; red 2008; dark gold 2007; light green 2006 and 2003 pink.

Table 74 IN1Z Development Areas

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Barton Pl, Portland	2	20.0	20.0	20.0
Browning Street, Portland	2	20.0	20.0	40.0
Cliff Street, Portland	1	10.0	10.0	50.0
Fitzgerald Street, Portland	1	10.0	10.0	60.0
Henty Hwy, Portland	1	10.0	10.0	70.0
King St, Portland	1	10.0	10.0	80.0
Kunara Cres, Portland	1	10.0	10.0	90.0
Rhodes Street, Casterton	1	10.0	10.0	100.0
Total	10	100.0	100.0	

Source: Glenelg Shire

Map 60 IN1 Subdivision Permits Portland



Source: Glenelg Shire

Map 61 IN1Z Subdivision Permits Casterton



Source: Glenelg Permits

The ten proposed subdivision plans with their respective locations are highlighted in Table 75. As shown by the Table the breadth of subdivision proposal ranges from actual subdivisions to certification of a three lot subdivision to various lot consolidations. The ten proposals are at various stages of completion. Tables 76 & 77 show the year in which the subdivision permit was applied for and its progress through the Glenelg Planning Department. Seven applications have now been certified and the SOC been issued.

As indicated by the Table, three applications are still progressing through the planning process.

Table 75 IN1Z Subdivision Proposals by Location

Proposal	Barton PI, Portland	Browning Street, Portland	Cliff Street, Portland	Fitzgerald Street, Portland	Henty Hwy, Portland	King St, Portland	Kunara Cres, Portland	Rhodes Street, Casterton	Total
2 Lot Subdivision for Certification PS547821G	0	0	0	0	0	0	0	1	1
3 lot Subdivision	0	0	0	0	0	1	0	0	1
Certification Plan - Two (2) Lots	0	1	0	0	0	0	0	0	1
Certification Plan of Consolidation	0	0	0	0	0	0	1	0	1
Certification Plan of Subdivision PS 613862A	0	0	0	0	1	0	0	0	1
Certification Plan of subdivision/consolidation	1	0	0	0	0	0	0	0	1
Certification Three (3) Lot Subdivision	0	1	0	0	0	0	0	0	1
Certification two (2) lot subdivision	0	0	0	1	0	0	0	0	1
Creation of a Reserve and Road with no new lot.	1	0	0	0	0	0	0	0	1
Section 35 application - no additional lots	0	0	1	0	0	0	0	0	1
Total	2	2	1	1	1	1	1	1	10

Source: Glenelg Shire

Table 76 Subdivision Permit Process through the Glenelg Planning Department

		Application Date						
		2003	2006	2007	2008	2009	2010	Total
Decision	Certified and SOC Issued	1	3	0	2	1	0	7
	Referral	0	0	1	0	0	2	3
	Total	1	3	1	2	1	2	10

Source: Glenelg Shire

Table 77 Progress of IN1Z Permits through the Glenelg Planning Process

Property Address * Decision Crosstabulation

Count		Decision		
		Certified and SOC Issued	Referral	Total
Property Address	Barton Pl, Portland	1	1	2
	Browning Street, Portland	0	2	2
	Cliff Street, Portland	1	0	1
	Fitzgerald Street, Portland	1	0	1
	Henty Hwy, Portland	1	0	1
	King St, Portland	1	0	1
	Kunara Cres, Portland	1	0	1
	Rhodes Street, Casterton	1	0	1
	Total	7	3	10

Source: Glenelg Shire

20.4 Current IN1Z Portland Soil Characteristics

The Portland IN1 zone divided into three soil categories. The northern soil area has been classified as Chromosol soil type by the DPI.

Map 62 Northern Portland Soil Map for Industrial 1 Zone



Source: Glenelg Shire

These soils are generally considered for broad acre cropping and have the following characteristics for the northern areas of Portland.

Table 78 North Portland IN1Z Soil Characteristics

Soil Condition	Level
Acidification	Medium to high
Dispersive Behaviour	Moderate
Land instability	Low
Nutrient decline	Moderate
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	7
Impeding	<200 mm
Drainage	Impervious
Total Topsoil	80 mm

Source: Glenelg Shire

The soil category for the middle area of the IN1Z in Portland has been classified as Rudosols. A Rudosols soil is suitable for either broad acre farming or conservation uses.

Map 63 Soil Map for the Middle Section of the Industrial 1 Zone of Portland



Source: Glenelg Shire

Table 79 IN1 Z Soil Characteristics Middle Section South Portland

Soil Condition	Level
Acidification	Medium to high
Dispersive Behaviour	Moderate
Land instability	Low
Nutrient decline	Moderate
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	7
Impeding	>300 mm
Drainage	rapid
Total Topsoil	210 mm

Source: Glenelg Shire

The soil category for the southern area of the IN1Z in Portland has been classified as Chromosols soil type. The soils of the southern IN1Z area of Portland have exactly the same properties as those for the northern area of Portland.

Map 64 Soil Map for the Southern Section of the Industrial 1 Zone of Portland

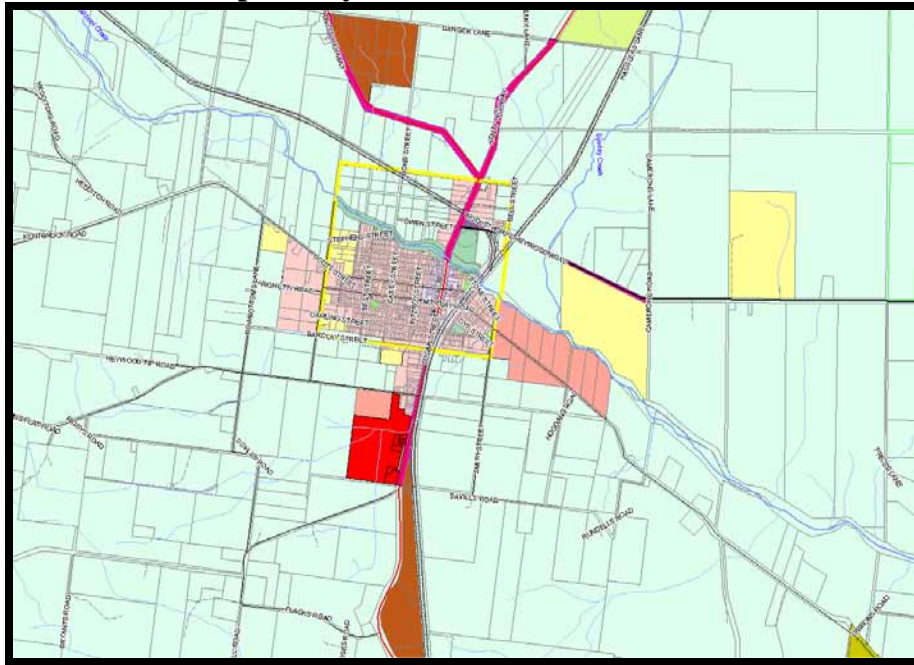


Source: Glenelg Shire

21 Current IN1Z Heywood

Heywood has 9 parcels which have been identified as IN1 Zone with a combined area of 31.28 hectares within a 5 km radius of the CBD of Heywood. This land is colored red on the map and is located to the south of Heywood.

Map 65 Heywood IN1Z Industrial Land



Source: Glenelg Shire

Table 80 provides an overview of the IN1 zone in the Heywood area. The levy code shown in the Table represents a rating code which the shire uses to assess the level of property tax which is assessed to each property.

Table 80 Summary Industrial 1 Zone Heywood

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	Hectares
IN1Z	50B	Residential built	1	1	0	28.06
	54B	Comm/indust built	8	8	0	3.22
TOTAL			9	9	0	31.28

Source: Glenelg Shire

21.1 Fire Proneness of the Zone

The Industrial 1 zone is not prone to bushfires

21.2 Land Use Impediments

The potential occurrences of sink holes are the only potential major land use impediment affecting this zone.

21.2.1 Levels of Fragmentation in the Zone

This zone has not been grossly impacted by fragmentation.

21.2.2 Subdivision Permits

See section 16.3.1 for comments relating to Heywood.

21.3 Current IN1Z Heywood Soil Characteristics

The Heywood IN1Z has two soil classifications as identified by the Victorian Department of Primary Industry and the Department of Sustainability and Environment. The two areas have been identified as Chromosols.

Table 81 Heywood IN1 Z Soil Characteristics

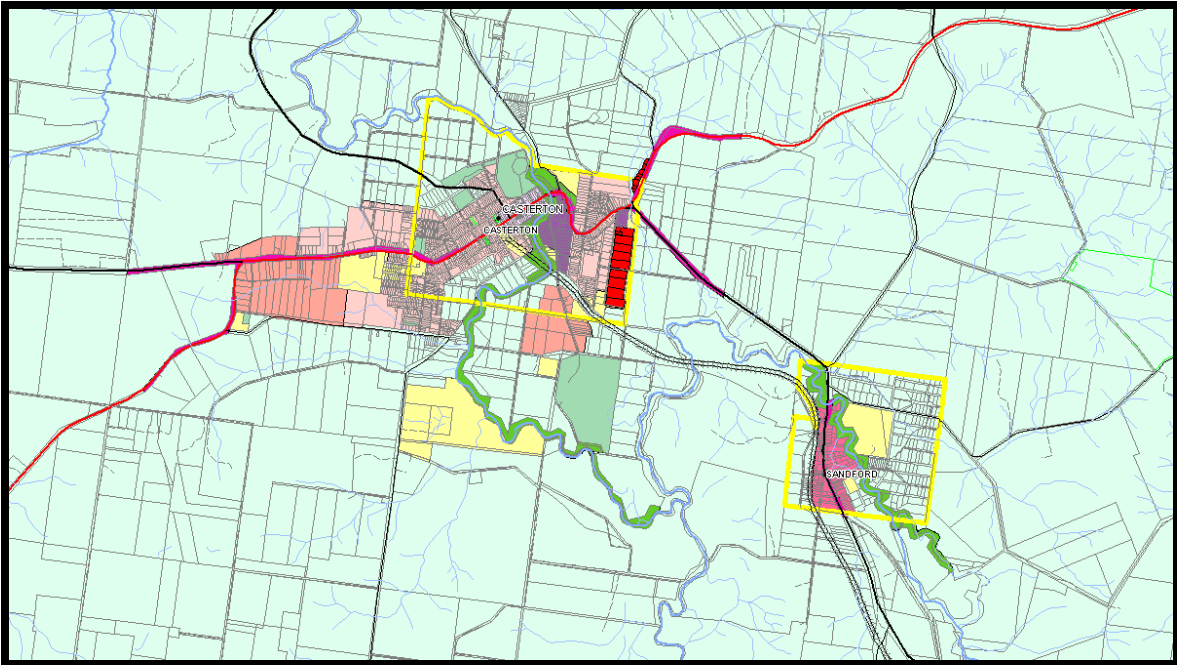
Soil Condition	Level
Acidification	Medium to acidic
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Moderate
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Medium
pH	5:10 - 7
Impeding	Impeding < 200mm and impeding > 300mm
Drainage	Impervious
Total Topsoil	80 – 195 mm

Source: Glenelg Shire

22 Current IN1Z Casterton

In Casterton there are 20 parcels designated Industrial1Zone with a combined area of 19 hectares.

Map 66 Summary of Industrial 1 Zone in Casterton



Source: Glenelg Shire

Table 82 Summary of Industrial 1 Zone Casterton

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	Hectares
IN1Z	41C	Residential built	4	4	0	0.8
	42C	Residential land	4	0	4	7.71
	43C	Comm/Indust built	3	3	0	1.79
	50B	Residential built	1	1	0	0.22
	54B	Comm/indust built	4	4	0	0.82
	58B	Farm built	4	4	0	7.36
TOTAL			20	N/A	N/A	18.7

Source: Glenelg Shire

22.1 Fire Proneness of the Zone

The IN1 zone is not prone to bushfires

22.2 Land Use Impediments

The potential occurrences of sink holes are the only potential major land use impediment affecting this zone.

22.3 Levels of Fragmentation in the Zone

This zone has been grossly impacted by fragmentation. Forty percent (8 out of 20 parcels are designated residential in a zone dedicated to heavy industry)

22.3.1 Subdivision Permits

See section 16.3.1 for comments relating to Casterton

22.4 Current IN1Z Casterton Soil Characteristics

The Casterton IN1Z has the following Dermosols soil characteristics as identified by the Victorian Department of Primary Industry and the Department of Sustainability and Environment

Table 83 Casterton IN1Z Soil Characteristics

Soil Condition	Level
Acidification	Medium
Dispersive Behaviour	Low
Land instability	Medium
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low
Water logging	Medium
Water erosion	Low
Wind Erosion	Low
pH	5.2
Impeding	Impeding > 300 mm
Drainage	Impervious
Total Topsoil	215 mm

Source: Glenelg Shire

22.5 Challenges and Options

22.5.1 Challenges

The Industrial 1 zone (IN1Z) in Glenelg has several challenges ranging from physical constraints to residential encroachment.

22.5.1.1.1 *Portland*

1. Physical constraints including Flooding and Sinkholes
2. Residential encroachment in the zone
3. The impact of Heritage sites and buffer relating to the IN1 zone.
4. The overall visual amenity of the Industrial 1 zone in relation to the Glenelg Landscape

22.5.1.1.2 *Heywood*

- Lack of Industrial 1 developments
- Abundance of industrial land in the area
- No flooding/residential contamination which would impact on IN1 developments
- No sinkholes
- No industrial buffer –no impact of residential

22.5.1.1.3 *Casterton*

- No demand
- Flooding constraints
- Infrastructure-electrical power?
- Fragmentation with residential

22.5.2 Options

One of the options Glenelg needs to consider is designation of the Heywood area as the preferred area for industrial expansion in the shire.

With respect to Portland a second option is to designate the northern areas as preferred industrial areas.

23 IN2 Zone

23.1 Rational for IN2 Zone Inclusion in the Study

The IN2 Z zone is the dedicated heavy industry zone for Victoria. For Glenelg the IN2 zone is represented by the Portland Aluminum Smelter. This zone is at the northern and southern most points of Portland. A large tract of IN2 zoned land exists for future expansion of heavy industry in the greater Portland region. This zone is critical for the long term economic viability of Glenelg.

23.2 Purpose

The Industrial 2 Zone has three purposes:

- To provide for manufacturing industry, the storage and distribution of goods and associated facilities in a manner which does not affect the safety and amenity of local communities.
- To promote manufacturing industries and storage facilities that require a substantial threshold distance within the core of the zone.

- To keep the core of the zone free of uses which are suitable for location elsewhere so as to be available for manufacturing industries and storage facilities that require a substantial threshold distance as the need for these arises.

The greater Portland area has 138 designated IN2 parcels with a combined area of 847 hectares. Only Portland has this classification of zone in Glenelg. Table 84 indicates the location of IN2Z zone land in the Greater Portland Area.

Table 84 INZ 2 Parcels in Glenelg by Location

		locality			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PORTLAND	94	68.1	68.1	68.1
	PORTLAND NORTH	44	31.9	31.9	100.0
	Total	138	100.0	100.0	

Source: Glenelg Shire

23.3 Current Land Use

IN2Z contains 138 parcels which have been segmented into 10 categories of property levy codes. Sixty – seven (67) percent or 93 of the 138 parcels (Aluminium Smelter; P commercial / industrial built; P farm built; P – residential built; P rural-residential built) have some sort of a built structure situated on the respective property. There are only 34 vacant parcels of IN2Z land in the greater Portland area.

Table 85 IN 2 Land Use by Property Levy Description

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	.7	.7	.7
P-Aluminium Smelter	13	9.4	9.4	10.1
P-Comm/Indust Built	50	36.2	36.2	46.4
P-Comm/Indust Land	19	13.8	13.8	60.1
P-Farm Built	5	3.6	3.6	63.8
P-Farm Land	7	5.1	5.1	68.8
P-Non Rateable	10	7.2	7.2	76.1
P-Residential Built	23	16.7	16.7	92.8
P-Residential Land	4	2.9	2.9	95.7
P-Rural/Resid Built	2	1.4	1.4	97.1
P-Rural/Resid Land	4	2.9	2.9	100.0
Total	138	100.0	100.0	

Source: Glenelg Shire

From 2000 to the end of 2009, 4817 building permits were issued across Glenelg. Seventy (70) permits were issued for the IN2 Z zone during that time frame with construction value of \$9,553,065.

Table 86 Building Permits 2000-2009 For Industrial Two Zone

Aluminium Smelter			Commercial - Industrial Built		Farm Built		Res. Built	
Year	Number	Value	Number	Value	Number	Value	Number	Value
2000	0	0	3	\$317,847	0	0	1	\$4,800
2001	4	\$274,000	1	\$125	0	0	0	0
2002	21	\$2,500	4	\$390,000	1	\$4,800	2	\$39,700
2003	2	\$100,00	3	\$1,105,000	0	0	2	\$18,000
2004	0	0	3	\$177,000	0	0	2	\$53,000
2005	1	\$11,500	7	\$3,114,118	0	0	3	\$40,520
2006	5	\$279,500	4	\$1,988,760	0	0	0	0
2007	3	\$304,000	3	\$128,944	0	0	1	\$9,200
2008	6	\$775,575	3	\$51,696	0	0	0	0
2009	1	\$282,00	3	\$78,500	0	0	1	\$1980
Total	23	\$2,029,075	34	\$7,351,990	1	\$4,800	12	\$167,200

Source: Glenelg Shire

Glenelg's allocation of IN2Z was compared to surrounding shires to develop an index which would indicate the level of IN2 Z zoned land per head of population. The following regional centers were used in the analysis: Apollo Bay; Ararat; Camperdown; Casterton; Colac; Hamilton; Heywood; Horsham; Port Fairy; Portland; Terang; Torquay and Warrnambool

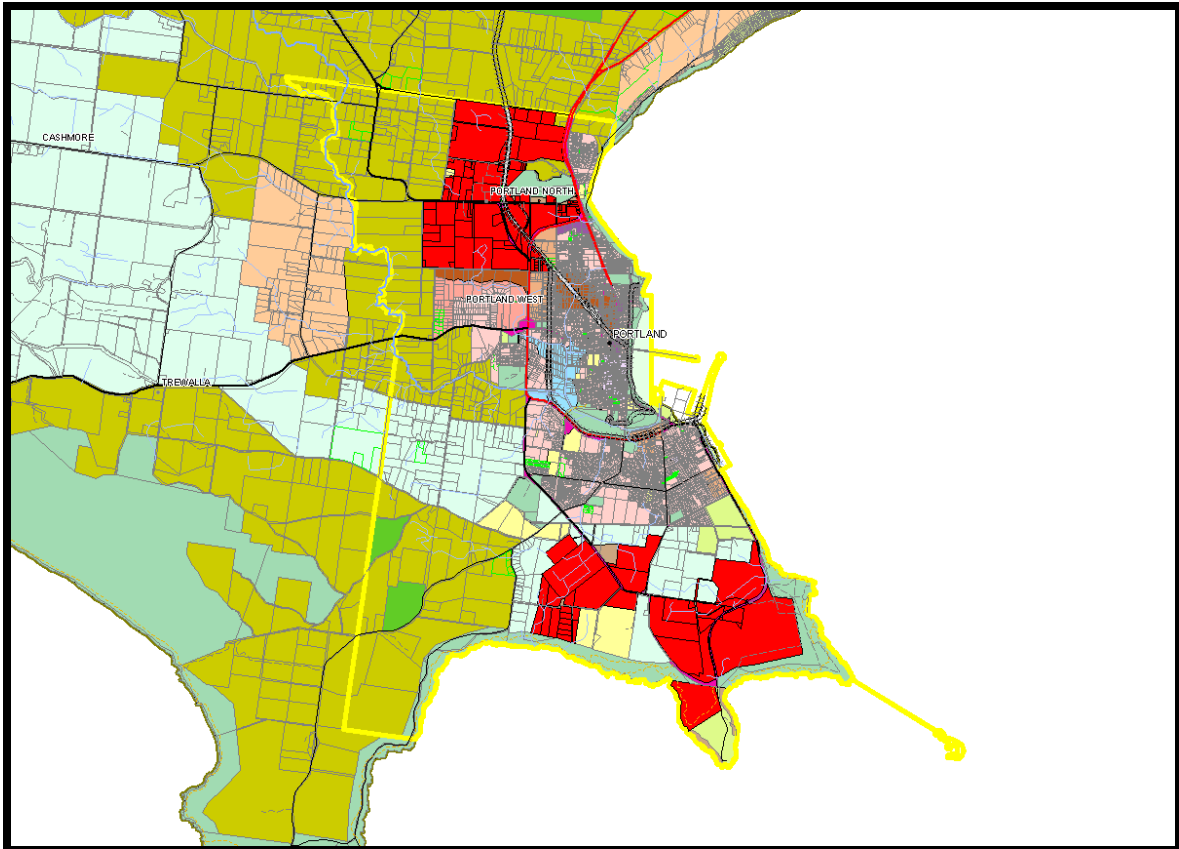
Two of the 13 locations have the IN2 zone. The IN2 zone is a general zone for the provision of land for manufacturing industry, the storage and distribution of goods and associated uses in a manner which does not affect the safety and amenity of local communities.

Town	Population	Total IN2Z Area (Sq Meters)	IN2Z per head of population
Apollo Bay	1278	N/A	N/A
Ararat	7067	N/A	N/A
Camperdown	3028	N/A	N/A
Casterton	1618	N/A	N/A
Colac	10562	N/A	N/A
Hamilton	9484	1,316,072	138.79
Heywood	1229	N/A	N/A
Horsham	13290	N/A	N/A
Port Fairy	2631	N/A	N/A
Portland	9716	10,394,684	1069
Terang	1787	N/A	N/A
Torquay	9468	N/A	N/A
Warrnambool	28029	N/A	N/A
Total	99187		

Portland's large amount of IN2 zone land can in part be explained by the large allocation of IN2 zoned land to the Portland Smelter (approximately one third of all IN2 zoned land).

24 Current IN2 Portland

Map 67 Industrial 2 Zone Portland



Source: Glenelg Shire

24.1 Fire Prone ness of the Zone

The IN2 Z is not fire prone.

24.2 Land Use Impediments

The impediments for this zone include flooding, sink holes and residential expansion into what was classified a heavy industrial zone. There are 39 vacant parcels which have an approximate area of 2.5 million square meters

24.3 Land Use Fragmentation

Nearly 25% of the IN2 Z has been contaminated with residential development.

24.3.1 Subdivision Permits

For the period 2000 -2010 there were 5 subdivision applications submitted for the Industrial 1 Zone (IN1Z). Table 87 highlights the year and the respective number of subdivisions permits received by Glenelg Shire.

Table 87 IN2Z Subdivision permits by year

		Application Date			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2005	4	80.0	80.0	80.0
	2008	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

Source: Glenelg Shire

Subdivision development in the IN2Z has occurred since 2005. This development has occurred in both greater Portland area and as indicated in Table 88. Map 68 indicates that IN2 subdivisions has occurred in several locations in Portland (i.e. Henty Highway, Darts Road and Westlakes Road)

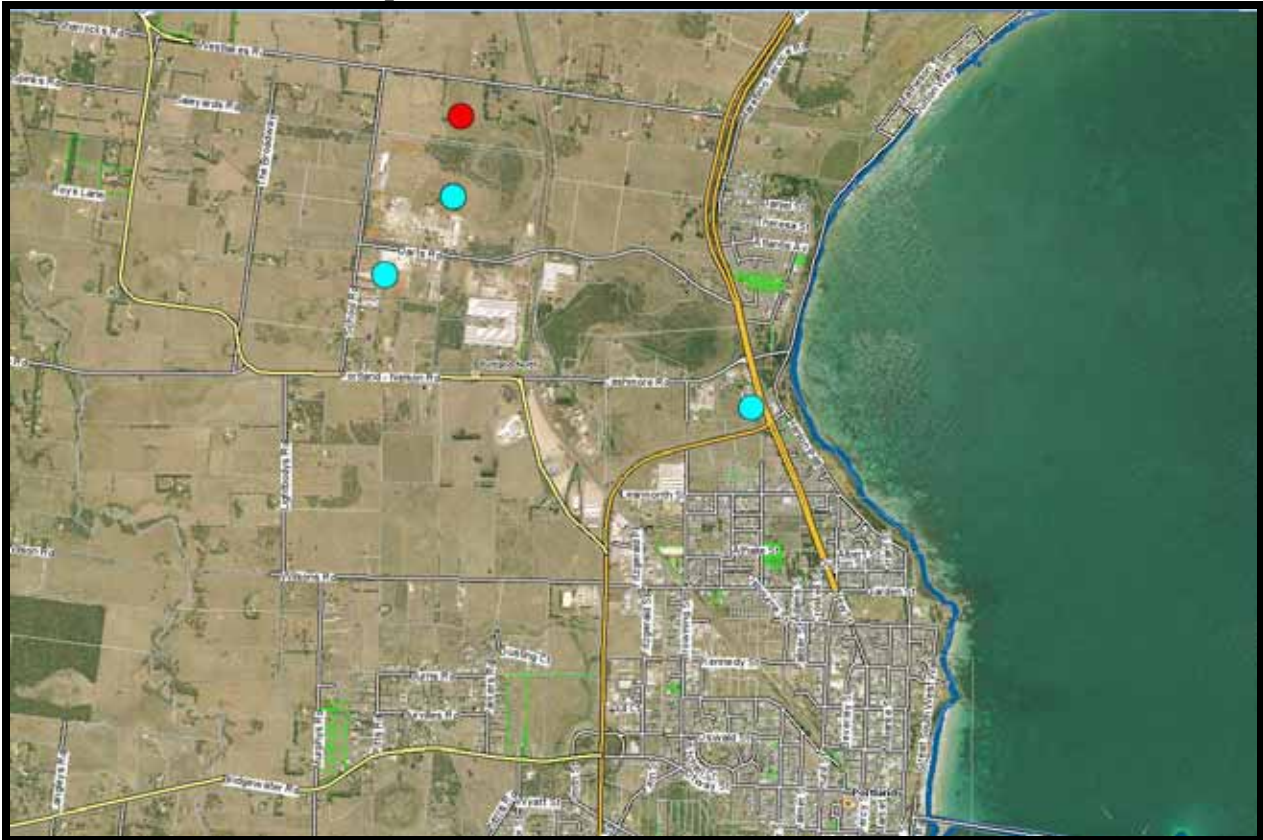
Table 88 IN2 Development Areas

		Property Address			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	605-607 Henty Highway, Portland	1	20.0	20.0	20.0
	Darts Road, Portland North	1	20.0	20.0	40.0
	Darts Road, Portland Parish	2	40.0	40.0	80.0
	Westlakes Rd, Portland North	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

Source: Glenelg Shire

The colour keys for the respective maps are red 2008 and light blue 2005.

Map 68 IN2 Subdivision Permits Portland



Source: Glenelg Shire

The five proposed subdivision plans with their respective locations are highlighted in Table 89. As shown by the Table the breadth of subdivision proposal ranges from actual subdivisions to a subdivision procedural plan. The five proposals are all completed. Table 90 shows the year in which the subdivision permit was applied for and its progress through the Glenelg Planning Department.

Table 89 IN2Z Subdivision Proposals by location

Proposal	605-607 Henty Highway, Portland	Darts Road, Portland North	Darts Road, Portland Parish	Westlakes Rd, Portland North	Total
2 Lot Subdivision	0	0	2	0	2
3 Lot Subdivision	1	0	0	0	1
Subdivision (2 Lot)	0	1	0	0	1
Subdivision Procedural Plan (Road Acquisition)	0	0	0	1	1
Total	1	1	2	1	5

Source: Glenelg Shire

Table 90 IN2 Subdivision Permit progress through the Glenelg Planning Department

Decision * Application Date Crosstabulation

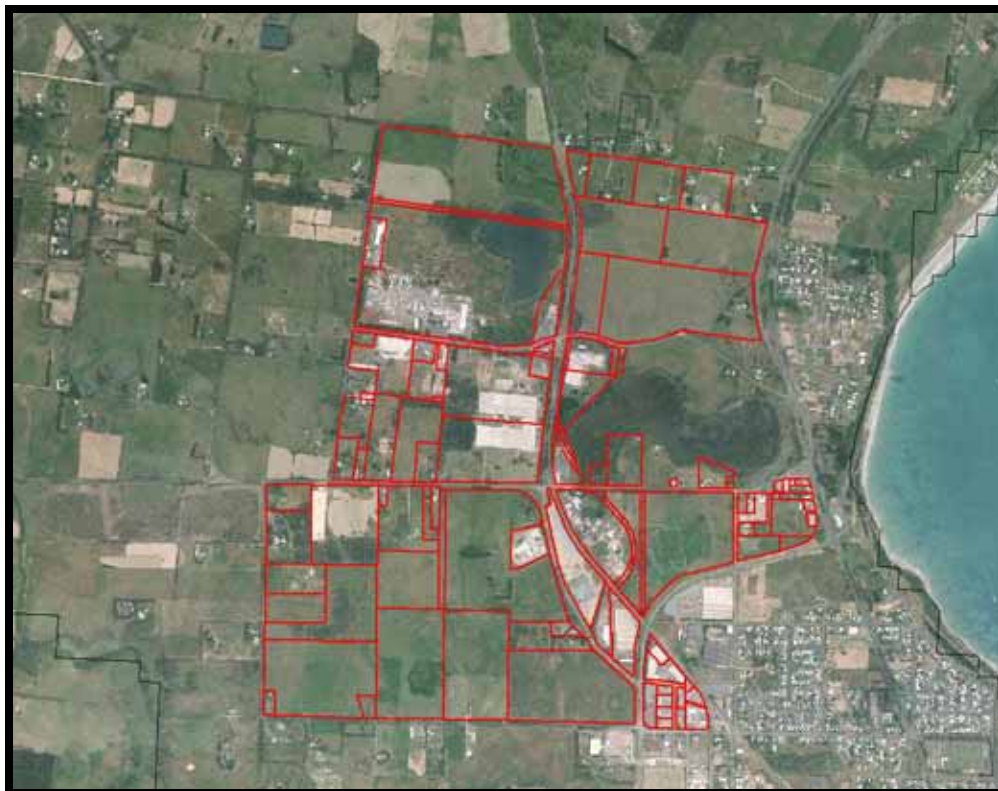
Count		Application Date		
		2005	2008	Total
Decision	Certified and SOC Issued	4	1	5
	Total	4	1	5

Source: Glenelg Shire

24.4 Current IN2Z Portland Soil Characteristics

The Portland IN2 Zone is divided into three soil categories. The northern area has been classified as a Chromosol soil type area by the DPI.

Map 69 Northern Portland Soil Map for Industrial 2 Zone



Source: Glenelg Shire

These soils are generally considered for broad acre cropping and having the following characteristics for the northern areas of Portland.

Table 91 North Portland IN2 Soil Map

Soil Condition	Level
Acidification	Neutral
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	7.0
Impeding	< 200 mm
Drainage	Impervious
Total Topsoil	80 mm

Source: Glenelg Shire

The Smelter area has two soil categories. The first category is Kurosols which is primarily used for broad acre farming. The second is Chromosols which is one of the most prevalent soil types in the Portland area.

Map 70 Soil Map for Portland Smelter Area



Source: Glenelg Shire

Table 92 Soil characteristics for Portland Smelter Area

Soil Condition	Level
Acidification	Moderately acidic
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	6.7 to 7.1
Impeding	200 >
Drainage	Medium well drained
Total Topsoil	200 – 250 mm

Source: Glenelg Shire

The third area, west of the smelter has been identified as a Kurosol soil area. This area is a continuation of the soil patterns which surround the Portland Smelter.

Map 71 IN2 Zone Western Portland Area Soil Map for IN2 Zone



Source: Glenelg Shire

Table 93 Soil Characteristics for IN2Z in West Portland

Soil Condition	Level
Acidification	Moderately acidic
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind Erosion	Low
pH	7.1
Impeding	300 >
Drainage	Medium well drained
Total Topsoil	200 mm

Source: Glenelg Shire

24.5 Challenges and Options

24.5.1 Challenges

There are many challenges facing this zone including:

1. Lack of demand
2. Physical constraints such as flooding and sink holes
3. Residential encroachment

24.5.2 Options

Use Industrial 2 zone for other activities either rezone for industrial 1 or industrial 3 purposes.

25 IN3 Zone

25.1 Rational for IN3 Zone Inclusion in the Study

The Industrial 3 zone acts as a buffer between heavy industry and other land use activities. This zone plays an important role in the industrial land use planning for the shire.

25.2 Purpose

The IN3 Zone has three purposes:

- To provide for industries and associated uses in specific areas where special consideration of the nature and impacts of industrial uses is required or to avoid inter-industry conflict.
- To provide a buffer between the Industrial 1 Zone or Industrial 2 Zone and local communities, which allows for industries and associated uses compatible with the nearby community.
- To ensure that uses do not affect the safety and amenity of adjacent, more sensitive land uses.

Portland and Heywood are the only areas in Glenelg which have this zone. In Portland there are 258 parcels with a total area of 72 hectares

Table 94 IN3 Zone by Location

		locality			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HEYWOOD	13	5.0	5.0	5.0
	PORTLAND	245	95.0	95.0	100.0
	Total	258	100.0	100.0	

Source: Glenelg Shire

25.3 Current Land Use

The IN3 Zone contains 258 parcels which have been segmented into 9 categories of property levy codes with a combined area of 149.92 hectares.

Table 95 IN3 Land Use by Property Levy Description

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	.8	.8	.8
B-Comm/Indust Built	6	2.3	2.3	3.1
B-Comm/Indust Land	1	.4	.4	3.5
B-Rural/Resid Built	3	1.2	1.2	4.7
B-Rural/Resid Land	3	1.2	1.2	5.8
P-Comm/Indust Built	100	38.8	38.8	44.6
P-Comm/Indust Land	30	11.6	11.6	56.2
P-Non Rateable	5	1.9	1.9	58.1
P-Recreational Built	2	.8	.8	58.9
P-Residential Built	106	41.1	41.1	100.0
Total	258	100.0	100.0	

Source: Glenelg Shire

From 2000 to the end of 2009, 4817 building permits were issued across Glenelg. One hundred and ninety three (193) multiple permits were issued for the IN2 Z zone during that time. When the permits are rationalized they are reduced to 112 for an average of 12 per year. This figure does not represent actual construction as some of the permits may have lapsed or construction

was not undertaken. The nominal value of the of construction permit for the period 2000-2009 was \$6,469,000.

Glenelg’s allocation of IN3Z was compared to surrounding shires to develop an index which would indicate the level of IN3 Z zoned land per head of population. The following regional centers were used in the analysis: Apollo Bay; Ararat; Camperdown; Casterton; Colac; Hamilton; Heywood; Horsham; Port Fairy; Portland; Terang; Torquay and Warrnambool.

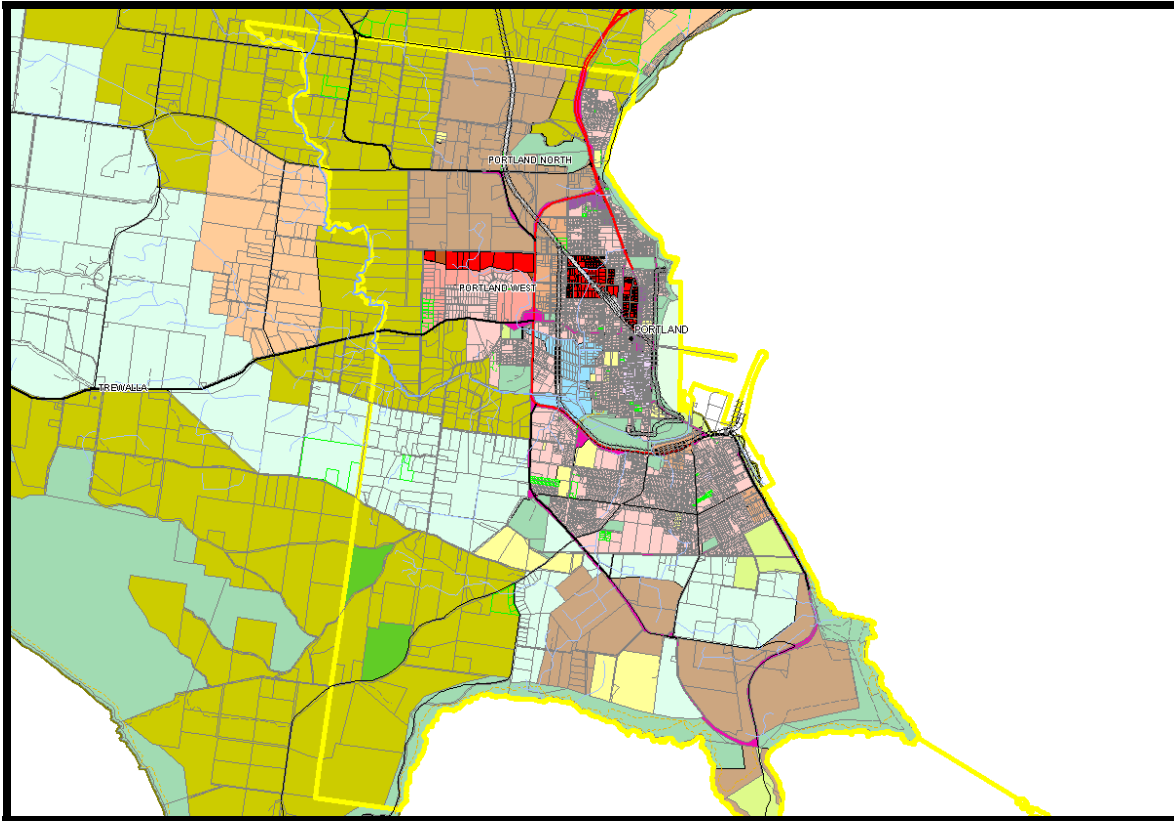
Town	Population	Total IN3Z Area (Sq Meters)	IN3Z per head of population
Apollo Bay	1278	N/A	N/A
Ararat	7067	151,532.2	21.44
Camperdown	3028	NA	Na
Casterton	1618	NA	Na
Colac	10562	N/A	N/A
Hamilton	9484	N/A	N/A
Heywood	1229	769,652	626
Horsham	13290	180,381.5	13.57
Port Fairy	2631	N/A	N/A
Portland	9716	800,623	82.40
Terang	1787	20,169	11.286
Torquay	9468	55,772	5.8
Warrnambool	28029	347,783.2	12.41
Total	99187		

Seven out of the thirteen centers have IN3Z zoning. Portland’s total IN3 figure is misleading as it is inflated with residential and recreational development. Approximately 240,000 square meters is actually residential or recreational.

26 Current IN3Z Portland

Portland has 258 parcels of Industrial 3 land with a combined area of 72 hectares these areas are colored red on Map 72. The location of Industrial 3 land is in the northern regions of Portland. The Industrial 3 land in Portland has been corrupted with the inclusion of residential properties scattered throughout the zone. Table 96 highlights how fragmented the IN3 zone is in Portland.

Map 72 Ind3 Zone in Portland



Source: Glenelg Shire

Table 96 Summary Table of Ind3 Zoning in Portland

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	HA
IN3Z	2p	Residential Built	106	106	0	22.94
	4p	Comm. /Indust.Built	109	109	0	38.311
	5 P	Comm. /Indust.Land	43	0	52	8.75
	11 P	Recreation Built	2	2	0	0.25
	15 P	Non Rateable	5	N/A	N/A	1.4
Total			258	217	52	71.89

Source: Glenelg Shire

26.1 Fire Proneness of the Zone

The IN2 Z is not fire prone.

26.2 Land Use Impediments

Flooding, sinkhole and the encroachment of residential development impacts on this zone

26.3 Land Use Fragmentation

This zone has been highly fragmented with over 41% of the zone having residential allotments or dwelling in it.

26.3.1 Subdivision Permits

For the period 2000 -2010 there were four subdivision applications submitted for the Industrial 3 Zone (IN3Z). Table 97 shows the year and the respective number of subdivisions permits received by Glenelg Shire.

Table 97 IN3Z Subdivision permits by year

		Application Date			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2005	1	25.0	25.0	25.0
	2008	2	50.0	50.0	75.0
	2009	1	25.0	25.0	100.0
	Total	4	100.0	100.0	

Source: Glenelg Shire

Subdivision development in the IN3 zone has only occurred post 2005. This development has been in Portland as indicated in Table 98. Map 73 indicates that IN3Z subdivisions have occurred in three locations in Portland (1) west of Percy Street and (2) south of Julia Street.

The colour keys for the respective maps are yellow 2009; red 2008 and light blue 2005.

Table 98 B1 Development Areas

		Property Address			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Garden St, Portland	1	25.0	25.0	25.0
	Island View Pde, Portland	1	25.0	25.0	50.0
	Rossdell Court, Portland	2	50.0	50.0	100.0
	Total	4	100.0	100.0	

Source: Glenelg Shire

Map 73 IN3 Subdivision Permits Portland



Source: Glenelg Shire

The four proposed subdivision plans with their respective locations are highlighted in Table 99. As shown by the Table the breadth of subdivision proposal ranges from actual subdivisions to certification of an eight lot subdivision to various lot consolidations. The nine proposals are at various stages of completion. Table 100 shows the year in which the subdivision permit was applied for and its progress through the Glenelg Planning Department. Three applications have now been certified and the SOC been issued.

Table 99 Subdivision Activity in Portland IN3 Zone

		Property Address			Total
		Garden St, Portland	Island View Pde, Portland	Rossdell Court, Portland	
Proposal	2 Lot Subdivision	0	0	1	1
	Certification Two (2) Lot Subdivision	1	1	1	3
	Total	1	1	2	4

Source: Glenelg Shire

Table 100 Decisions by Year IN3Z Portland

		Application Date			Total
		2005	2008	2009	
Decision	Certified and SOC Issued	1	0	0	1
	Permit Refused	0	2	0	2
	Referral	0	0	1	1
	Total	1	2	1	4

Source: Glenelg Shire

26.4 Current IN3 Z Portland Soil Characteristics

The Portland IN3 Z has the following Chromosol soil profile as identified by the Victorian Department of Primary Industry and Department of Sustainability.

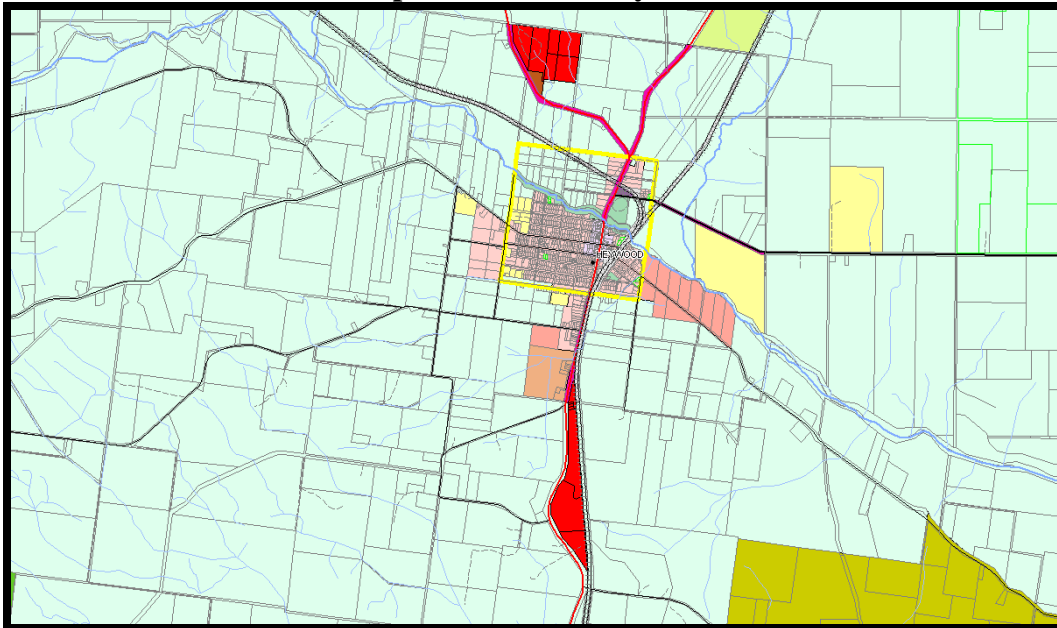
Table 101 IN3 Portland Soil Characteristics

Soil Condition	Level
Acidification	Moderately acidic
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind erosion	Low
pH	7
Impeding	<200
Drainage	Impervious
Total Topsoil	80

27 IN3 Heywood

Heywood contains 13 parcels of Ind3 land with a total area of 78 hectares.

Map 74 IN3 Zone Heywood



Source: Glenelg Shire

Table 102 Summary of IND3 Zone in Heywood

Zone	Levy Code	Levy Description	Total	No. Built	Vacant	Hectares
IN3Z	52B	Rural/Resid built	3	3	0	1.78
	53B	Rural/Resid land	3	0	3	26.84
	54B	Comm/indust built	6	6	0	32.2
	55B	Comm/indust land	1	0	1	17.21
TOTAL			13	9	4	78.03

27.1 Fire Proneness of the Zone

This area has a low level of fire hazard.

27.2 Land Use Impediments

The major land use impediment would be urban residential encroachment and sinkholes.

27.3 Land Use Fragmentation

The IN3 zone in Heywood has been compromised with just under 50% of all allotments being residential in an industrial zone.

27.3.1 Subdivision Permits

27.4 Current IN3Z Heywood Soil Characteristics

The Heywood IN3 Z has the following Chromosol soil profile as identified by the Victorian Department of Primary Industry and Department of Sustainability.

Table 103 Heywood IN3 Soil Characteristics

Soil Condition	Level
Acidification	acidic
Dispersive Behaviour	Low
Land instability	Low
Nutrient decline	Low
Salinity	Low
Soil Structure Decline	Low
Water logging	Low
Water erosion	Low
Wind erosion	Low
pH	5.10
Impeding	>300
Drainage	Impervious
Total Topsoil	195 mm

Source: Glenelg Shire

27.5 Challenges and Options

27.5.1 Challenges

- Lack of demand
- Physical constraints such as Sink holes
- Conversion to other uses

27.5.2 Options

Rezone the excess IN3 zone to other purposes such as residential or low density

